MARTEN FALLS FIRST NATION
COMMUNITY ACCESS ROAD

Environmental Assessment / Impact Statement

February 2026

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A Message from Chief Bruce Achneepineskum

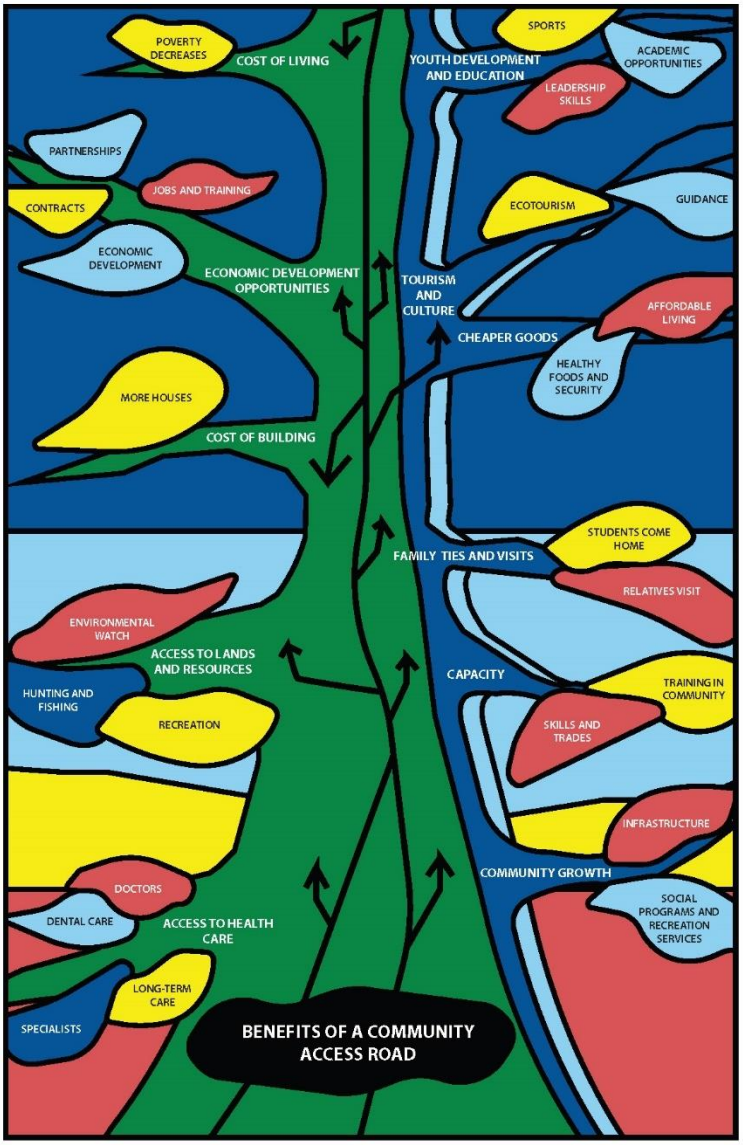
Boozhoo / Wachey,

For generations, Marten Falls First Nation has dreamed of connecting our remote northern community to the Ontario provincial highway network and the rest of the province. This vision is about more than building a road—it's about creating a future where our people can thrive. With the release of the Final Environmental Assessment / Impact Statement for our Community Access Road, we are closer than ever to making the road a reality.

After many years of planning, technical studies, data collection, and consultation and engagement with Indigenous communities and the public, we have reached a milestone that fills our community with hope and excitement. Through this Assessment Process, we considered both the natural environment and the cultural and economic concerns of our community, including the acknowledgement of our Indigenous and Treaty rights.

As we move forward, the Province and the Impact Assessment Agency of Canada will review the Environmental Assessment / Impact Statement and supporting documents—in consideration of feedback from Indigenous communities and interested persons—to determine whether our submission meets the regulatory requirements. This decision, along with other permits and approvals, are needed before construction can commence.

For Marten Falls members, the Community Access Road means freedom—the ability to travel safely and easily, to visit family without barriers and to access opportunities that were once out of reach. It means a future where isolation no longer defines us, and where our youth can look forward to education, careers and a life full of possibilities.



The tree, as Chief Bruce Achneepineskum envisioned, represents the long-term benefits afforded by the Community Access Road.

The importance of the Community Access Road to Marten Falls First Nation members cannot be overstated. For too long, our community has faced challenges that threaten our well-being—housing shortages, boil water advisories, mental health crises, reduced opportunities for our youth, and the staggering cost of food and supplies. These hardships have inspired us to take action and create change. Year-round access will ensure dependable routes to healthcare, education and social services, giving our members the support they need and deserve.

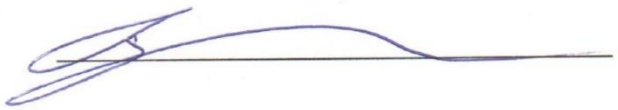
Beyond meeting essential needs, the Community Access Road will open doors to economic growth. It will lower freight costs, attract investment, and create jobs that respect our traditions and values. It will help lift families out of poverty and foster sustainable development for generations to come.

The Community Access Road is more than infrastructure; it is a symbol of resilience and hope. It stands as a testament to our determination to overcome barriers and build a brighter future for our children and grandchildren. For Marten Falls members, this road means new possibilities—access to economic development that can create collective partnerships in the region, bring jobs and prosperity, reliable routes for healthy foods and food security, and improved access to social programs and services that support our families. The Community Access Road represents the promise of a community where every member can thrive, where traditions are honored, and where the next generation can look forward to a life filled with opportunity. We invite all First Nations and the public to recognize the profound importance of this project and to support its timely completion.

Our community looks forward to continuing this conversation with you as we take the next steps through the Assessment Process. Thank you for your support and dedication to this initiative—you've helped bring us closer to realizing our dream of a strong, connected and prosperous future for Marten Falls First Nation.

Respectfully,

Chief Bruce Achneepineskum
Marten Falls First Nation



MARTEN FALLS FIRST NATION
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Executive Summary

The Marten Falls First Nation Community Access Road (Community Access Road) is a proposed, 184 kilometre, all-season road that will connect the Community to the Ontario provincial highway network. Planning for the road must meet both federal and provincial requirements before approval can be granted to proceed with construction activities.

One of the federal requirements is the preparation of an assessment summary of the Final Environmental Assessment / Impact Statement that contains sufficient details for the reader to understand the Project. To meet this requirement, and provide readers with easy access to the information they value most, we have created a package of information that consists of the following components:

- Executive summary;
- Chiefs letter;
- Technical discipline plain language summaries); and
- Other supporting information.

The federal and provincial process use different terminology. The Environmental Assessment / Impact Statement has been prepared typically using the federal terminology, except for effects assessment, which is used interchangeably.

ES 1. Our Story

We, Marten Falls First Nation, are an Anishinaabe community located at the junction of the Albany and Ogoki Rivers in northern Ontario. The nearest major city to our Community is Thunder Bay, Ontario, approximately 430 kilometres to the southeast.

This land has provided generously for our people, who have lived for generations according to its rhythms and been governed by its natural laws. We call this Anishinaabe bimaadiziwin—Anishinaabe way of living. It describes the way in which we, as spiritual beings, are connected to the land and all other living beings. As Anishinaabe people, we follow a set of instructions and teachings—called mino-bimaadiziwin / living a good life—that were gifted to us by the Creator and detail how we must interact with all of Creation in ways that are good and healthy.

Our ancestors lived seasonally, following the natural cycles of hunting, fishing and gathering. Colonization; however, brought drastic changes. Newcomers unfamiliar with our ways overhunted animals and imposed policies like the *Indian Act* (Government of Canada, 2019a), which restricted our traditional practices and mobility. Our children

were taken to residential schools, where many suffered abuses, leaving a legacy of intergenerational trauma.

The remote location of our Community poses significant hardship. Marten Falls is only accessible year-round by air transportation out of Thunder Bay and Nakina, Ontario. In addition to access by air, a winter access road is built on an annual basis, but climate change is making this temporary road increasingly less reliable. This limits access to essential goods and services, while also limiting economic growth and opportunity. The possibility to visit family and keep our bonds strong is also limited, as is our access to the broader region, food, clean drinking water, fuel, building supplies and health care services.

To remedy these issues, we are proposing a multi-purpose all-season community access road which will connect us to the Ontario provincial highway network. It will open access to goods and services and will allow our community members to move towards a better future. An all-season community access road will allow us to assert our sovereignty and secure a better future for our members. The Community Access Road is also an act of economic reconciliation. We are proposing an approach to sustainable development that is framed by our worldview as Anishinaabe peoples and is steeped in our Community's values.

ES 2. Why We Need This Road

The Community Access Road will connect us to the main highways in Ontario. It will allow families to visit one another more easily and make travel safer. It will lower the cost of food, fuel and other supplies, and will improve community services like health, education and wellness. Our new road to the Community will also open new opportunities for the Community to grow and flourish.

A multi-purpose road can also increase economic opportunities for Indigenous communities and others. The Community Access Road is anticipated to create jobs during construction and through operations. It will improve Marten Falls First Nation's access to employment opportunities because our members will be able to reliably commute to work year-round.

While the main use of the Community Access Road will be for Marten Falls First Nation, the province also wants it to be used for potential future mineral exploration. Building the Community Access Road is part of the provincial government's promise to create jobs, provide long-term benefits and make life better for people in the far north.

The Community Access Road will not solve all our challenges, but it does represent a step in a positive direction. It opens the door to new opportunities to grow as a community and offers hope for a better future.

ES 3. Our Roles

We, Marten Falls First Nation, are the Proponent of the Community Access Road. We are also an Indigenous community who needs to be consulted with. We have one Chief and eight council members, who are elected every 2 years in accordance with the *Indian Act* electoral system. As both the Proponent and the governing body, our Chief and Council have the unique responsibility to further the Community Access Road while also verifying that community members are consulted with and heard. They are also responsible for representing our members in a way that promotes the best interests of our Community. The power to make major decisions resides with the Community and Chief and Council. This includes, for example, the approval of the Preferred Route of our road and approval of the Final Environmental Assessment / Impact Statement.

The Marten Falls First Nation Community Access Road Project Team (the Project Team) was formed to support us in the preparation of the Environmental Assessment / Impact Statement, and in meeting consultation and engagement requirements. The Project Team includes two Senior Community Member Advisors, a Project Director and a Technical Lead. The Project Team acts with the guidance, direction and input from our Chief and Council, the Community Member Advisors and the community membership.

The Project Team is tasked with managing and guiding the consultants, dealing with financials, responding to inquiries and reviewing technical documents among other tasks. The Project Team is also tasked with providing the Community and Chief and Council with regular updates on progress, upcoming decisions needed and next steps. They work with the technical discipline specialists and engineers to find a way to share data and information with Marten Falls First Nation.

ES 4. How We Selected Our Road

Since 2007, a lot of effort has been invested in identifying the preferred route for the Community Access Road. In 2019, the choice was narrowed down to two alternatives—Alternative 1 and Alternative 4. Both start at Painter Lake Road and run north approximately 130 kilometres before turning eastward towards our Community, roughly following the north side of the Albany River.

Alternative 1 and Alternative 4 run parallel, overlap and cross each other at multiple locations. There were three main route options from which to choose the preferred route. These included choosing an alternative to cross the Ogoki River, choosing one to cross the Albany River and finally choosing the alternative that turns eastward towards Marten Falls.

Between 2019 and 2024, technical discipline specialists had collected data for their areas of expertise to understand the existing conditions of the natural, socio-economic and cultural environments. In the summer of 2023, the technical discipline specialists and engineers were asked to consider the data available to them, including Indigenous Knowledge, to identify the criteria that would be used to compare Alternative 1 and Alternative 4 and ultimately identify the preferred route. Results of this comparison, along with the Community's recommendations, were shared with our community members, our Chief and Council, Indigenous communities, interested persons and government agencies. The initial recommendations evolved in consideration of the feedback received, and a preferred route recommendation was presented to our Chief and Council for consideration. A Band Council Resolution supporting the preferred route (the Preferred Route) was signed on August 26, 2024. Refer to **Figure ES 4-1** for the Preferred Route.

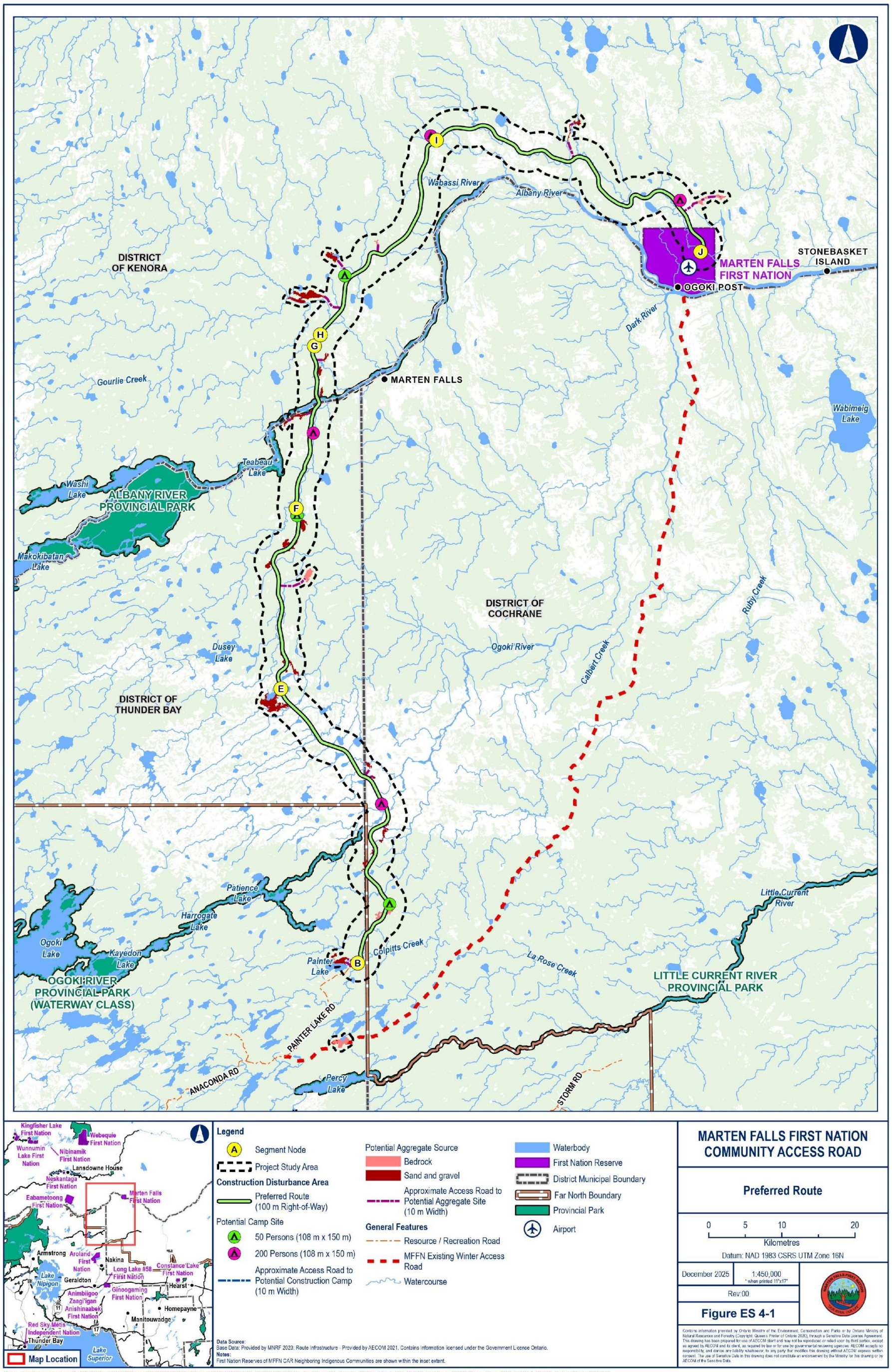
ES 5. Roles of the Regulators

Before being able to build the Community Access Road, approvals need to be obtained for different project activities, like construction of the Community Access Road and the setting up aggregate sites to help with construction. In the case of the Community Access Road, there are both federal and provincial requirements that need to be met before obtaining those approvals.

A Draft Environmental Assessment / Impact Statement was released in 2025 to allow Indigenous communities, the public, and regulators an opportunity to provide their feedback. The Final Environmental Assessment / Impact Statement was prepared to meet the intent of both the federal Tailored Impact Statement Guidelines (Impact Assessment Agency of Canada, 2020a) and the provincial Terms of Reference. Feedback on the Draft Environmental Assessment / Impact Statement has been reviewed and incorporated, as appropriate, to prepare the Final Environmental Assessment / Impact Statement.

The regulators will evaluate the information provided, along with feedback received from Indigenous communities and interested parties, to reach a decision on whether or not the Final Environmental Assessment / Impact Statement meets their requirements.

Figure ES 4-1: Preferred Route



ES 6. Our Approach

The methodology to complete an Environmental Assessment / Impact Statement is complicated and very technical. The Final Environmental Assessment / Impact Statement for the Community Access Road needs to meet both federal and provincial requirements. The following bullet points offer a summary of the steps completed as part of the effects assessment.

- **Indigenous Knowledge:** In 2019, the Project Team launched a program to collect Indigenous Knowledge. At the time of issuing the Final Environmental Assessment / Impact Statement some Indigenous communities had shared their Indigenous Knowledge. This was woven with scientific approaches. Both Indigenous Knowledge and western science were considered in forming the foundation for existing conditions, predicting potential effects and determining appropriate mitigation and monitoring methods.
- **Gender-Based Analysis Plus:** This is an approach to help understand who is impacted by a project and assess how they may experience impacts differently. Examples of this could include how women might experience construction camps near their community or Indigenous workers experience joining a majority non-Indigenous work force. This analysis is important to Marten Falls First Nation as a member of a visible minority. This analysis was approached differently by each technical discipline, as some have less direct influence on Gender-Based Analysis Plus than others.
- **Technical Disciplines:** A total of 18 technical disciplines are considered in the Environmental Assessment / Impact Statement. These were grouped into water, land and people.
- **Valued Components:** The effects assessment started with identifying what is valuable to Indigenous peoples, the public, federal authorities and interested parties and could be impacted by the Community Access Road; these are referred to as valued components. An initial list was provided by government agencies. Throughout the development of the field studies, the valued component list was expanded to consider Indigenous Knowledge and conversations with members of Marten Falls First Nation and other communities.
- **Indicators:** The next step was to find a way to measure potential effects or changes to each valued component resulting from the Community Access Road. These are called indicators. They represent the resource, feature or issue related to a valued component that, if changed, may demonstrate an effect on water, land or people.

- **Project Activities:** Understanding how project activities interact with water, land, and people during both construction and operation / maintenance phases is crucial for assessing potential effects. Not all construction and operations activities are relevant to every valued component.
- **Physical Boundaries:** These need to be defined to inform the areas which each valued component will study.
- **Temporal Boundaries:** These establish how long to consider the effects assessment. Specifically for the Community Access Road, construction, operations and maintenance were considered. Construction is anticipated to last between 3 and 10 years, while operations and maintenance are anticipated to be permanent activities.
- **Existing Conditions:** Data on land, water and people were gathered to understand the current conditions of the area in and around the Community Access Road.
- **Residual Effects:** The existing conditions, along side the description of anticipated construction, operations, and maintenance activities, were used to determine the potential interactions between the Community Access Road and land, water and people. After the potential interactions were determined, potential effects to the valued components were identified, and strategies to avoid or mitigate the effect were examined. Residual effects are the effects remaining after the application of mitigation measures. Residual effects assessments identified positive and negative effects to the existing conditions as a result of the Community Access Road. With this information, the technical disciplines drafted a description of the anticipated effects to each valued component.
- **Cumulative Effects:** The *Impact Assessment Act* (Government of Canada, 2019b) requires that each Environmental Assessment of a project consider any cumulative environmental effects that are likely to result from the project in combination with the environmental effects of other physical activities that have been or will be carried out. An inclusions list was prepared, which considered relevant existing and planned projects. The list was then updated with feedback from Indigenous communities, stakeholders and regulators. Each technical discipline reviewed the inclusions list to assess potential effects from other projects and added these to the effects to land, water and people from the Community Access Road. The cumulative effects assessment builds on the results of the effects assessment and will consider the incremental changes that are predicted to have a likely residual adverse effect on a valued component.

ES 7. The Engineering of our Road

The proposed Community Access Road will consist of a new all-season multi-purpose road from Painter Lake Road to Marten Falls. Options for road ownership, operation and maintenance activities, and liability are being considered in discussion with the province.

The Community Access Road will consist of the road itself, associated access roads, rest areas / pull outs, bridges, culverts, pits and quarries:

- Approximately 184 kilometres of all-season gravel road;
- Bridge and / or culvert installations for river and stream crossings;
- Right-of-way, approximately 100 metres wide, cleared to a width of 60 metres;
- Two-lane roadway, approximately 12 to 13 metres wide;
- Posted speed limit of 80 kilometres per hour;
- Culverts to maintain water flow connectivity and balance water levels;
- Borrow areas, aggregate and borrow source areas, and aggregate sites;
- Temporary access roads and construction of temporary crossings;
- Temporary work areas and camps, and
- Road maintenance facilities, rest stops, and pull-out areas.

The Final Environmental Assessment / Impact Assessment has completed a preliminary design of the roadway, meaning that the details of how the Community Access Road will be built are still conceptual and presented at a high level only.

ES 8. Life on Our Land

An important step of the Final Environmental Assessment / Impact Statement is to understand the current state of the natural environment, socio-economic environment and cultural environment, referred to as existing conditions. Environmental studies, both desktop and field, were completed by the technical disciplines to document and assess the existing conditions for both Alternative 1 and Alternative 4. As with the selection of the Preferred Route, the technical disciplines were grouped into water, land and people. The reason for this grouping is included below:

- **Water:** Water is life; it gives to the land and all the species that dwell here.
- **Land:** Marten Falls First Nation has a deep and enduring connection to the land. Land is central to their identity, culture and way of life. They view the land and its

living creatures as integral to the circle of life, essential for maintaining balance and harmony in the environment. Traditional activities, such as moose hunting, allow them to sustain their connection to the land and each other. While open to development, Marten Falls First Nation members emphasize the importance of conserving the land and resources to allow future generations to continue to enjoy and benefit from them.

- **People:** Trapping, fishing and hunting are important activities to maintain the Community's food security and cultural heritage. Once common practices for Marten Falls First Nation are being challenged because of economic changes and environmental impacts. Marten Falls First Nation values sustainable ecosystem management. Overall, community members are committed to preserving their way of life and supporting the health of their environment for future generations.

Given the volume and complexity of the information gathered through these studies, plain language summaries have been developed for each technical discipline to help the reader better understand the study findings. To avoid duplicating the information here, within the main body of the executive summary, the plain language summaries for technical discipline information are available under separate covers. These documents combined make up the assessment summary as required by the federal Tailored Impact Statement Guidelines. This information is also available on the Project site (Marten Falls First Nation, 2026).

Each technical discipline's plain language summary includes a description of the following:

- Introduction;
- Existing conditions;
- Potential effects and mitigations;
- Residual effects; and
- Cumulative effects.

We have combined some of the technical discipline plain language summaries where it makes sense to do so, for example, where they are interconnected and where the amount of information allows for combining. The plain language summaries are grouped as follows:

- Fish and fish habitat;
- Groundwater and surface water;
- Peatlands;

- Soils and vegetation;
- Wildlife and birds;
- Ungulates;
- Acoustic, atmospheric environment and green house gases;
- Archaeology and cultural heritage;
- Aboriginal and / or Treaty Rights and Interests;
- Climate change;
- Community well-being (economic, human health and community safety, and social); and
- Visual environment and land and resource use.

ES 9. How Our Road will Change Our Land

As noted above, information was collected for both Alternative 1 and Alternative 4 to understand existing conditions of the natural, socio-economic and cultural environments. The information was also used to support Marten Falls First Nation in choosing the Preferred Route. Each technical discipline completed an effects assessment. This consisted of potential effects (positive, negative, and neutral) as well as mitigation and enhancement measures, and an assessment of residual effects.

Each technical discipline used existing conditions information along side the description of anticipated construction, operations and maintenance activities. This was used to determine the potential interactions between the Community Access Road and the environment. After the potential interactions were determined, potential effects were identified, and strategies to avoid or mitigate the effects were examined. Mitigations are strategies to reduce the potential negative effects on the environment.

After implementing mitigation measures, a residual effects assessment is conducted to determine if any left-over effects remain. This allows that all potential effects are thoroughly evaluated and managed. A description of residual effects is included in the plain language summaries for each of the technical disciplines.

It is important to highlight some of the positive effects the Community Access Road could have in addition to those listed in ES 2. The Community Access Road will improve access to currently remote areas and may benefit Indigenous communities already connected to the provincial road network by making it easier to exercise traditional land use rights. Shorter and safer travel to hunting, trapping, and fishing grounds can extend seasons, lower costs, and strengthen traditional harvesting.

By improving access to traditional lands and teaching sites, the Community Access Road could also deliver positive outcomes. Elders and Knowledge Holders could more readily teach hunting, fishing, trapping, and food processing, strengthening intergenerational knowledge transfer. More time on the land reinforces life skills and cultural values alongside technical harvesting and could support everyday use of Indigenous languages. Community members would become engaged in preparing and sharing country foods, strengthening social bonds, and enhancing food security. Easier access could encourage participation in cultural activities and deepen connections to language and culture.

ES 10. Cumulative Effects

There are three key concepts relating to cumulative effects that need to be understood. These include:

- **Temporal Overlap:** When one activity happens at the same time as another activity;
- **Spatial Overlap:** When one activity happens in the same area as another activity; and
- **Reasonably Foreseeable Projects:** The last concept relates to projects that you can reasonably anticipate for consideration in the cumulative effects assessment.

To understand the cumulative effects on noise levels, you would need to:

- Understand existing conditions;
- Understand your **effects**;
- Consider mitigation measures;
- Assess **residual effects**, or the left-over effects after applying mitigation measures; and
- Add **potential effects from other activities**. Once you know the residual effects of your project, you would add the potential effects of other reasonably foreseeable projects that are happening at the same time, and in the same area.

Following the steps above helps identify the cumulative effects.

As indicated above, the plain language summaries include a description of cumulative effects for each technical discipline.

ES 11. We Listened

Marten Falls First Nation has been consulting and engaging on the Community Access Road with Indigenous communities, interested persons, and government agencies since 2019. As part of the Environmental Assessment Process (Assessment Process), Marten Falls First Nation was required to consult and engage with Indigenous communities, Tribal Councils and Political Treaty Organizations / Provincial Territorial Organizations.

Since the beginning of the Assessment Process, there have been significant achievements. A highlight of this process has been the ongoing communication and relationship building with Indigenous communities, government agencies, and interested persons, culminating in:

- Sharing early findings of the existing conditions reports, and results and recommendations, to support the selection of the Preferred Route;
- Obtaining a Band Council Resolution from Marten Falls First Nation for the Preferred Route in August 2024;
- Receiving and incorporating feedback on community-specific Milestone Progress Reports 1, 2, 3, and 4;
- Receiving and incorporating feedback (as appropriate) on the Draft Environmental Assessment / Impact Statement;
- Obtaining a Band Council Resolution from Marten Falls First Nation for the Final Environmental Assessment / Impact Statement in February 2026; and
- Submitting the Final Environmental Assessment / Impact Statement in February 2026 for further review and feedback.

Relationship building has been at the core of consultation and engagement efforts. Over the years, progress has been made to establish lines of communication, increase active participation, and satisfy / resolve concerns and issues. Progress has also been made to host Council-to-Council meetings between Marten Falls First Nation and other Indigenous communities (for example, Eabametoong First Nation and Aroland First Nation) to discuss relationship protocols, approaches for meaningful consultation and engagement, and to provide updates related to the Community Access Road.

As the Proponent for the Community Access Road, Marten Falls First Nation members had additional consultation and engagement opportunities, including meetings and the review of documents in advance of other Indigenous communities, government agencies, and interested persons. Material shared with Marten Falls First Nation during

meetings was edited based on community feedback to make sure the Project approach was based on direct input and feedback from the Community. This early involvement has allowed the Community to provide valuable insights and feedback on various aspects of the Community Access Road, including the Environmental Assessment / Impact Assessment process, Indigenous Knowledge Program, and route selection.

There have been various consultation and engagement activities up to the submission of the Final Environmental Assessment / Impact Statement.

Some highlights include, but are not limited to:

- Five Public Information Centres since the start of the Environmental Assessment milestone in October 2021;
- Four provincially-supported forums, including two Aboriginal and / or Treaty Rights and Interests Forums and two Three-Road Project Gathering and Expo, jointly held between the Community Access Road, Webequie Supply Road, and Northern Road Link with Indigenous communities;
- Over 50 virtual and / or in-person meetings with Indigenous communities, government agencies, and interested persons;
- Development and participation in the Indigenous Knowledge Program, Community Co-ordinator Program, and the Community Capacity Funding Program for Indigenous communities;
- Distribution and follow-up of consultation and engagement Progress Reports for Indigenous communities;
- Webinars and videos related to valued components, cumulative effects, climate change adaptation, route selection and route updates, and the Draft Environmental Assessment / Impact Statement; and
- Distribution of monthly E-Blasts (newsletters), field notices and discussion guides, and seeking feedback and input monthly by Indigenous Community Leads.

All of these activities culminate to help with the review of the Final Environmental Assessment / Impact Statement. Details on the consultation and engagement program are found in **Section 11** and **Appendix X**, the Final Record of Consultation and Engagement, including the Cumulative Effects Consultation Report.

ES 12. Our Changing Climate

Climate change presents many challenges in remote areas like Marten Falls. During the 2023 / 2024 winter season, most winter access roads to northern communities including Marten Falls were not opened or only opened for light traffic (Stimpson, 2024). Climate events such as increased rainfall, flooding, wildfire risks, extreme heat, and ecosystem shifts have the potential to affect both the construction and long-term use of the Community Access Road. If climate events result in the closure of the Community Access Road, it will also affect us and potentially other communities that depend on it.

The Community Access Road incorporates mitigation strategies to lower emissions from construction and maintenance activities. Adaptation measures are also incorporated by designing infrastructure that can withstand expected climate conditions. The goal is to build a road that is resilient and minimizes risks to surrounding communities in a changing climate. While these strategies will greatly enhance the Community Access Road's resilience, they will not eliminate all risks.

ES 13. Other Regulatory Requirements

One of the federal requirements is an assessment of potential accidents and malfunctions of the Community Access Road. Based on its design and intended use, professional judgement, and experience with other remote road projects, potential accidents or malfunctions were identified, such as spills, transportation accidents, and extreme weather events, among others.

Accidents can be prevented through good planning and design. In addition, safety measures can be implemented to reduce the likelihood of an accident happening and, if one does occur, to manage it effectively. A requirement that the owner / operator selected for construction of the Community Access Road will have to fulfill is the preparation and implementation of plans to prevent accidents and malfunctions. These could include but not limited to a Spill Contingency Plan, Waste Management Plan, Emergency Response Plan, and Wildlife Management Plan.

The Community Access Road will be designed in accordance with the Ontario Ministry of Transportation Roadside Design Manual (Ontario Ministry of Transportation, 2023). In addition, the geometric design criteria used for the design and construction of the Community Access Road will be based on the latest and best practices from the Transportation Association of Canada and Ministry of Transportation of Ontario Design Supplement.

The lack of an appropriate plan to support Indigenous communities and non-Indigenous workers in their interactions could also be considered a potential accident and malfunction to the Anishinaabeg culture. During construction, the owner / operator, with guidance and support from Marten Falls First Nation, will be required to provide mandatory, ongoing cultural awareness and sensitivity training to protect the Anishinaabeg. The training should be developed with Indigenous communities to avoid further damage due to the opening of roads to the north. It can also be a means to building trust and understanding, and to protect the Anishinaabeg culture.

The federal Tailored Impact Statement Guidelines require information on how the Community Access Road may contribute to Canada's ability to meet its environmental obligations and commitments. During the route selection process, the Project Team prioritized environmental sustainability when analyzing data collected by technical discipline specialists in the water, land, and people categories. This analysis confirmed that the Preferred Route for each of the three segments were those that had the least impact on the environment when compared to other options. Environmental sustainability was a consideration throughout, influencing the Preferred Route selection and the development of mitigation measures and monitoring activities.

ES 14. Monitoring Programs and Future Commitments

Monitoring programs serve to verify the accuracy of the effects assessment and evaluate the effectiveness of mitigation and enhancement measures. Monitoring programs also include future commitments related to mitigating residual effects. A project-specific environmental monitoring program will be developed and implemented that includes the monitoring commitments related to valued components presented in the Environmental Assessment / Impact Statement.

The Environmental Assessment / Impact Statement considers pre-construction and construction monitoring programs, as well as operation and maintenance monitoring programs and future commitments for the various technical disciplines.

ES 15. Summary and Recommendations

The Community Access Road will connect Marten Falls to Ontario's main highways, making travel safer and allowing families to visit one another more easily. It will help lower the cost of food, fuel, and other supplies while improving community services such as health care, education, and wellness. The Community Access Road will also create new opportunities for the Community to grow and flourish.

As a multi-purpose road, it can also increase economic opportunities for Indigenous communities and others. The Community Access Road is anticipated to create jobs during construction and through operations.

The Community Access Road will not solve all the Community's challenges, but it does represent a step in a positive direction. It opens the door to new opportunities to grow as a community and offers hope for a better future. As Chief Bruce puts it, "It is not just a path to progress; it is a testament to our resilience, our vision for the future, and our commitment to the well-being of our people." From a community point of view, the Marten Falls First Nation supports the Community Access Road.

Marten Falls First Nation looks forward to continuing the conversation on next steps throughout the Assessment Process.

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1. Our Story

We, Marten Falls First Nation (Marten Falls First Nation), are an Anishinaabe community located at the junction of the Albany and Ogoki Rivers in northern Ontario. These ancestral territories have historically been a place of abundant fish, wildlife, and berries that have sustained us since time immemorial. The nearest major city is Thunder Bay, Ontario, approximately 430 kilometres southeast of our Community.

The word Anishinaabe is used to describe a single Anishinaabe person, or the cultural grouping as a whole. Anishinaabeg is the plural form of the word, and is often used to describe those who belong to the group.

> Marten Falls was a fort (Marten Falls). The government and Indian agents named our people Marten Falls. Our real name is Wegwahjihna Ininiwag (Weh-gua-jih-na I-ni-ni-wag) (meaning: End of the Falls People). In the 1920s we moved down river because people were drowning in the rapids at Marten Falls. A baby drowned. Also, when planes came they couldn't land on the rapids.
> — **Elizabeth Achneepineskum**

> We were created different, but yet the same. — **Pearl Achneepineskum**

Our Community is remote, surrounded in silence and the beauty of nature and water. It allows for space and time to meditate in thoughts and spirit. Where we are in contact with nature, with its rhythms, smells and sounds, we can practice our traditional ancestral ways.

However, our remote location also poses significant hardship, as it limits access to essential goods and services while limiting economic growth and opportunity.

> Our life is very different compared to the push button world outside. Yet we enjoy where we are. We love this place which has absolutely no resources for our people. But, yet, still, we have survived. We have figured it out in-house. We can survive it all. We have become strong as a Nation because of our hardships.
> — **Pearl Achneepineskum**

The services currently available in our Community include a small general store, Band Office, nurse's station, elementary school, water treatment plant, and Nishnawbe Aski Police Service detachment. Despite the challenges, this land is integral to our identity as the Anishinaabe people of Marten Falls First Nation; it is our connection to our culture, our ancestors, and to the Creator.

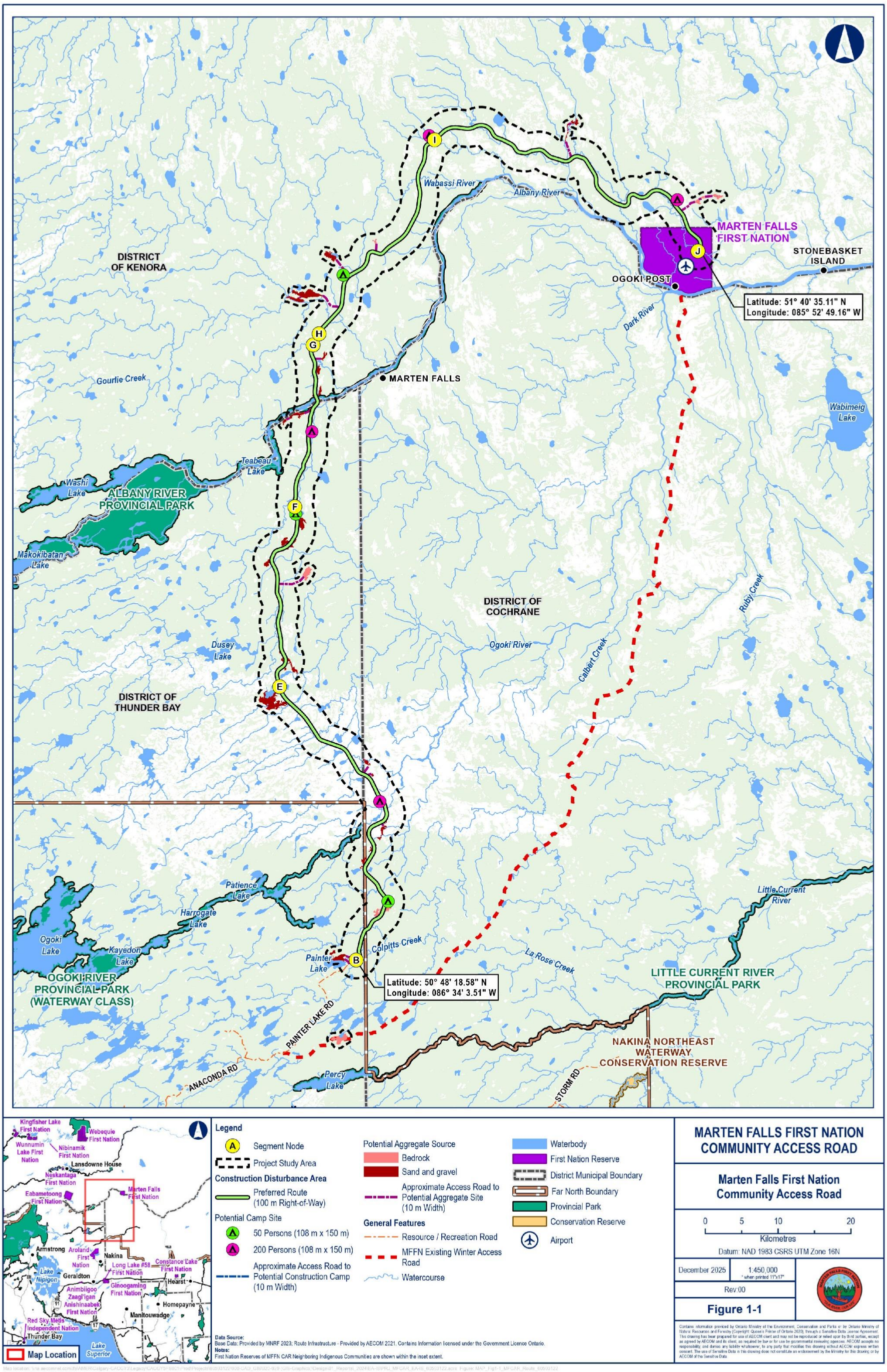
Marten Falls is only accessible year-round by air transportation out of Thunder Bay and Nakina, Ontario. Our Community members rely on air travel to obtain food, clothing,

fuel, and to see our family members or seek medical help. Air travel is a costly but necessary expense to maintain life in our Community. In addition to access by air, a winter access road is built on an annual basis when conditions permit. The winter access road is generally open between January and mid-March, depending on ice thickness, and permits passenger vehicles and large commercial vehicles to travel to Community until spring thaw. The winter access road allows for movement of building materials for homes, equipment for our Community, and other large or heavy items that are difficult to bring in by plane.

The annual construction and operation of the winter access road has become increasingly threatened by climate change, as warmer winters shorten the window in which the road is operational. In 2024, for example, weather conditions delayed the opening of the winter access road and it was only open for a short period of time (2 to 3 weeks, compared to 6 weeks historically). This further restricted our access to the broader region and made it increasingly difficult to access food, clean drinking water, fuel, building supplies, and health care services. The shortened window in which the winter access road operates also has impacts on our social interaction, as it is challenging to travel in and out of our Community to visit our relatives living inside and outside of Marten Falls. It especially poses challenges regarding our youth, who must leave their home, their families, and their Community to complete their education beyond the eighth grade. They often move to Geraldton or Thunder Bay, where they are effectively cut off from the Community and potentially have to face dangers and hardships on their own, without the support of their family nearby. Fortunately, starting in September 2024, students will be able to do most of their high school studies from home with online courses. This will be possible with the assistance of the Matawa Education and Care Centre.

To remedy these issues, we are proposing a multi-purpose all-season road of approximately 184 kilometres, which will connect to the Ontario provincial highway network (**Figure 1-1**). The proposed Marten Falls First Nation Community Access Road (our Road / the Community Access Road) is a measure by which we can assert our sovereignty and secure a better future for our members. Our Road is also an act of economic reconciliation so that our people have access to the broader region for better work opportunities, increased social cohesiveness, and easier, more affordable access to the goods and services that we need to thrive. We are proposing an approach to sustainable development that is framed by our worldview as Anishinaabe peoples and is steeped in our Community's values. In the words of Chief Bruce Achneepineskum (2023), "…[our] journey is towards self-determination, prosperity and it is a fight against climate change…we are leading our own future, our own prosperity, and making decisions in our own traditional territory."

Figure 1-1: Marten Falls First Nation Community Access Road



This land has provided generously for our people, who have lived for generations according to its rhythms and governed by its natural laws. We call this “Anishinaabe bimaadiziwin” (Anishinaabe way of living), the way in which we, as spiritual beings, are connected to the land and all other living beings. As Anishinaabe people, we follow a set of instructions and teachings called “mino-bimaadiziwin” (living a good life) that was gifted to us by the Creator, and details how we must interact with all of Creation in ways that are good and healthy. As described by Chief Bruce Achneepineskum (2019):

> In the Anishinaabeg creation story, humans are lowered to Earth by a spiritual ladder to inhabit a newly created Earth, to use all its abundant resources, to be allowed to use the land and its waterways as they needed, but never take more than needed as to do so will upset the balance of life.
>
> We are mainly moose hunters, and when we hunt it is only in fall time and not spring. I was told that this is because springtime is mating season for the moose, so there is a lot of baby moose around. And when you kill a young moose that moose will not have a chance to reproduce, and there will be less moose for the coming fall. And if you kill the mother moose the young moose will most likely not live long. Overall it’s just better to let the moose repopulate. — **Derek Baxter**

As Anishinaabeg, our ancestors historically lived according to the seasons, following goose in the early spring, and then trapping beavers and muskrats, and setting fishing nets in the late spring after the ice break-up.

> In the spring - they hunted geese, ducks, muskrat and fish and set nets. — **Elizabeth Achneepineskum**

Summers were spent in ceremony, as well as setting fishing nets, and gathering berries and medicines.

> In the summer - Sturgeon fishing, living off trapping money. A lot of members would go to Pagwa to work in lumber / cord cutting. Kids would help their parents. Kids would be happy eating oranges and bread for the first time down there as well. — **Elizabeth Achneepineskum**

Fall was spent preparing for winter by hunting moose, drying and smoking fish and meats, and preparing warm clothing and wigwam covers.

> [They] prepared for the winter in the fall (bijibiboon). While waiting for the ice to freeze they prepared snowshoes, smoked meat, hunted moose / big game.

> In the winter - they moved to their winter home. Usually go to the Marten Falls fort to get their groceries. They used to also go to the fort on January 1st to celebrate the new year, dance the year in. They used to dance to the violin. They had players from Marten Falls like Jim Windjack. — **Elizabeth Achneepineskum**

We still live our lives guided by these principles; however, time has brought substantial changes to our lands.

> We trapped otter, mink, marten, and beaver while living on the land. I don't think anyone traps the traditional way anymore, most people who did have passed away now. — **Mary Coaster**

Colonization brought newcomers who are not familiar with mino-bimaadiziwin. Many of the animals that we relied on to sustain us, and that were gifted to us from the Creator, were hunted to near-extinction during the fur trade. Additionally, many colonial policies were put into place that sought to destroy our way of life, such as the *Indian Act* (Government of Canada, 2019a). The government restricted our access to hunting, trapping, and fishing; reserves were created to limit our mobility; treaty rights were broken; our children were taken and sent to residential schools; some children were put up for adoption in the 60s scoop, and the colonial government banned us from practicing our ceremonies for nearly 70 years between 1885 and 1951.

> The *Indian Act*, that is the devil within Indian communities. *Indian Act* speaks for itself. A failure to my community. Government is still controlling. It seems we have to beg. Crowded homes is the biggest example. — **Vida Baxter**

The combined impact of these colonial efforts has been devastating to our way of life. In particular, the residential schools which sought to break our spirit and assimilate us into the Euro-Canadian society. Many of our community members were physically, emotionally, and sexually abused by nuns, priests, and other employees of these schools. We were sent away from the Community to attend the schools, cut off from our families, and forbidden from speaking our language. By the 1960s, we built a school within our Community so that we could take control of the education of our youth. However, the horrific abuses that were inflicted upon us has left an ongoing legacy of intergenerational trauma that we are still working to overcome today.

We have persevered despite this; however, accessible, safe education beyond the eighth grade continues to present challenges for our youth. While some may take advantage of the recent option to take high school classes online through Matawa Education and Care Centre, others may still choose to learn in person in Geraldton or Thunder Bay.

There are serious concerns about our youth's safety being so far from home at a vulnerable age. Sending youth away also hinders our ability to share intergenerational knowledge and important cultural practices during some of their most formative years.

> Our first suicide happened in 2019. We were the only reserve for a long time that didn't have suicide. It proves we did something right in raising our children.
> — **Pearl Achneepineskum**

In addition to education, our people face critical issues surrounding access to clean drinking water, food, medical care, and housing. Furthermore, we are acutely impacted by climate change, which threatens our winter access road – our lifeline for necessary supplies into our Community.

The Community Access Road that we are proposing is a way in which we can overcome these challenges and move towards a better future for our people. In proposing our Road, we are asserting our rights to develop our lands in accordance with our own laws for living a good life, mino-bimaadiziwin, by selecting construction routes, materials, and methods that are less disruptive to the natural world, including the peatlands. In doing so, we are showing our respect to Creation and we know that the land will continue to provide abundantly for the generations to come.

> Eli (former Chief of Marten Falls First Nation) once said we are not throwing away our native culture, we are innovating a new approach to help our future.
> — **Elizabeth Achneepineskum**

2. Why We Need This Road

2.1 Our Current Transportation Options

As mentioned in **Section 1**, our Community is currently only accessible year-round by air transportation out of Thunder Bay or Nakina, Ontario. During the winter months, if weather conditions allow, a 140-kilometre winter access road is built on an annual basis. Travelling on the winter access road can be dangerous. The sun sets early in winter and there are no lights on the winter access road. Cellular reception is unreliable and there are no rest stops. There is a lot of large commercial vehicle traffic on the winter access road as it is the only way for us to obtain building materials for homes, equipment for our Community, and other large or heavy items that are difficult to bring in by airplane.

We have a total of 870 registered members with approximately 350 living in our Community. Although our land is of breathtaking beauty, life in our Community can be challenging. We face a shortage of available housing, access to clean drinking water, as well as social challenges brought on by colonization – youth suicide and alcoholism, as well as opioid, crack, cocaine, and crystal meth addictions.

> Drugs are crippling our community. More programs need to be operational to provide support. More treatment services can be accessed easier with an all-season road. So costly to fly in and out all the time. — **Delia Okeese**

Table 2-1 provides information on movement in and out of our Community to give an overview of our access challenges.

The winter access road has been determined to be insufficient to meet the needs of our Community. It is open for a short period of time and has become unreliable due to climate change.

> It costs the government a lot of money to build a winter road every year. We could have had an all-season road by now. We always have to be careful of ice thickness on the lake and river crossings and pagwawana (sinkholes on the muskeg). Pagwawana do not freeze in the winter. — **Elizabeth Achneepineskum**

Table 2-1: Travel by Airplane and Winter Access Road

Mode of Transportation	Frequency	Notes
Airplane	• Average 6 flights per week (in and out): 3 flights per week from Nakina and 3 flights per week from Thunder Bay • 3 flights per week carrying freight • 3 flights per week carrying passengers	• Flights can be commercial or charters • One of the weekly flights brings 4,000 litres of diesel fuel • Round trip plane ticket to Thunder Bay is between $500 and $750 • Round trip plane ticket to Nakina is approximately $500
Winter Access Road	• Approximately 30 commercial loads in / out per winter • Local traffic between 7 and 8 vehicles per day	• Opens between January and mid-March and remains open for an average of 6 weeks • There have been years when the road is not open due to weather conditions • Materials coming in are primarily for housing, including wood, shingles, concrete and plumbing; enough material for 8 to 10 houses per year.

During the 2023 / 2024 winter season, most winter access roads to northern communities including Marten Falls were not opened or only opened for light traffic (Stimpson, 2024). As such, northern Ontario First Nations declared a state of emergency over winter roads (Global News, 2024).

Although transportation by air is available, it is expensive and is not an option for the transportation of large items like building supplies and household appliances. This affects how much it costs to live in our Community in addition to affecting our quality of life due to limited access to basic social, health, education, and wellness services. It is not uncommon for the airport to be closed for multiple days due to storms and fog, which further isolates us.

> Road access will benefit people with cost of living, transportation for people to come in and out. Perhaps create more jobs for people in the long run.
> — **Norma Achneepineskum**

> The Community Access Road will make it possible for people (members) to bring loved ones home to be buried as it is too expensive to use the plane.
> — **Rosie Achneepineskum**

The road should be built because it will be easier to get affordable food up north. It will also make constructing houses and buildings more affordable.
— **Judy Slipperjack**

The all-season access road will provide cheaper costs of food, gas and travel.
— **Delia Okeese**

2.2 Purpose of Our Road and Why We Need It

We have been waiting for a road for 40 years. — **Elizabeth Achneepineskum**

There are thousands of roads in Canada that benefit a lot of people. I understand environment assessments need to be done, but it seems to take forever. I want our all-season road to be a priority. — **Vida Baxter**

The wait is now over. We have decided to be the Proponent of our own road to create opportunities and secure a better future for the coming generations.

Our Road will connect us permanently to the main highways in Ontario. Having this road will make travel safer and lower the cost of food, fuel, and other supplies. It will also improve our Community services like health, education, and wellness, and open up new opportunities for our Community to grow. It is also possible that having a road will encourage some of our community members who currently live somewhere else to move back to Community.

The Community Access Road is a positive step. I cannot wait to see when this road becomes a reality. Community members will have the liberty to come and go whenever they please. It's an opportunity for whole families to leave the community and visit their relatives who reside outside of Marten Falls. With climate change, the winter road has become very unreliable and often times community members are unable to transport fuel, construction materials and other heavy goods.

The Community Access Road will also bring food security and affordable housing to community members and lower the cost of living overall. It has been a long time coming!

If we work together, we will get this road done! — **Lawrence Baxter**

Regarding the Community Access Road Project, I am most excited about the positive changes that it will provide. The road will provide access to a better quality of life in terms of accessing healthcare, emergency care and other travel

> for healthcare needs for our community members. It will help provide access to fresh food and give our community opportunities to build and bring materials for new homes, home improvements and upgrades to important buildings. A road can help students access family and give Marten Falls First Nation high school students the chance to see family members regularly. One day we can build our very own high school, so they don't have to leave their parents at 13 to 14 years old for months at a time. The Community Access Road Project plays a pivotal role in the Marten Falls First Nations' social and economic development.
> — **Susanna Baxter**

In addition to these benefits, our Road can also be used by others like other Indigenous communities, mining, forestry and tourism. By allowing it to be used for more than one purpose, we can keep other infrastructure to a minimum in the far north. This fits with our Community's land use plans.

While the main use of the Community Access Road will be for our Community, the road will also be used for potential future mineral exploration. The timing, ownership, funding, and feasibility of those potential future roads or mine developments are not known at this time. Our Road will benefit our Community regardless of a future link to potential northern mine development areas. One of the main challenges to development projects in the far north region is the cost of transportation and access to infrastructure. As such, a multi-purpose road can increase economic opportunities for our Community and others.

We expect our Road to create jobs during construction, maintenance, and operations. It will improve our access to employment opportunities because we would be able to reliably commute to work year-round. We anticipate our Road will be used by personal vehicles (for example cars, vans, and small trucks) and commercial vehicles, including larger trucks. The building and regular maintenance of our Road will give our Community the opportunity to develop transferable skills in equipment operations, and project management that can be used for other community and industrial projects in the region.

Our Road will not solve all our challenges, but it is a step in a positive direction. It opens the door to a new future, opportunities to grow as a Community and offer hope for a better future.

> The impact they are afraid of is already happening. The drugs are already here. The moose hunters are already here. The planes are already here. The tourists are already here. The impact is already happening. We could walk across our river last year it was so dry. We are already directly affected by development. People, moose and fish adapt. — **Elizabeth Achneepineskum**

> The bottom line is that my community needs the Community Access Road. What else do we need to say? Words on paper and our words should be implemented. All remote communities should be compensated with the high costs of living which causes poverty. There are limitations on housing, education, and hydro. — **Vida Baxter**

> I would like to see the road built. — **Mary Coaster**

2.3 Government Involvement and Funding

The need for all-season access to northern communities was identified in Building Better Lives: Ontario's Long-Term Infrastructure Plan 2017 (Ministry of Infrastructure, 2017). The north is especially at risk from climate change, and many communities rely on winter access roads for transportation and supplies. The Growth Plan for Northern Ontario (Ministry of Infrastructure and Ministry of Northern Development, Mines and Forestry, 2011) also promises to work with remote communities to improve access. Building our Road is part of the provincial government's promise to create jobs, provide long-term benefits, and make life better for people in the far north.

The government has promised to fund the planning and regulatory approval for a road from Marten Falls connecting to the existing provincial highway in the south (Marten Falls First Nation, 2017a). This road is the only option that will allow us to travel in and out of the Community at any time and guarantee that we can offer a better future to our members. Other options were considered but they did not meet the needs of our Community entirely.

3. Our Roles

We, Marten Falls First Nation, are the Proponent of our Road. We have been working with engineers and consultants on the design and regulatory applications for our Road.

The sections below describe the roles of our community members, our Chief and Council, and those tasked with advancing our Road.

3.1 Our Community Members

Our Community needs this road; and there has historically been support and interest in having a road. To guarantee our involvement in the decisions of our Road, we have taken on the role of Proponent. However, we also need to make sure we listen to our Community members and incorporate their feedback to get consensus before moving forward. This puts Marten Falls First Nation in the unique position of being both the Proponent and an Indigenous community that must be consulted.

> The all-season road will benefit the next generation. Cost of living would go down. Families of the students travelling for school would be able to see their families more often. — **Delia Okeese**

> The first time building a road was mentioned one elder said to build it on hard ground, 'not in the muskeg as it will be difficult to maintain it.' Another elder said, "The Creator put us here where we can have everything to live a good life; air, water, land, nature, animals for food, trees for shelter and warmth, medicines from beaver and roots, etc." — **Rosie Achneepineskum**

3.2 Our Chief and Council

As an Indigenous community we have one Chief and eight council members, which form our Chief and Council. They are elected every 2 years in accordance with the *Indian Act* electoral system (Government of Canada, 2019a). Their current term expires on September 29, 2025.

Our Chief and Council have a unique responsibility as both the Proponent of our Road, and as our governing body. They also have a responsibility to represent the members of Marten Falls First Nation in a way that promotes the best interests of our Community. Our Chief and Council approves the direction of the Community Access Road with guidance from the Community and senior community members.

3.3 The Project Team

We wanted the process to securing our Road to be community-led. Our Community members have been involved in developing solutions and advancing decisions since 2017. Preparing the Environmental Assessment / Impact Statement, as well as complying with the consultation requirements is not a simple task. We formed the Community Access Road Project Team (the Project Team), which includes two Senior Community Member Advisors, a Project Director, and a Technical Lead. The Project Team acts with the guidance, direction, and input from our Chief and Council, our Community Member Advisors, and our community membership to:

- Manage our Road and meet the requirements for the Environmental Assessment / Impact Statement. This includes managing engineers and consultants supporting the preparation of this Environmental Assessment / Impact Statement and all of the supporting documents;
- Keep our Community up to date on plans and progress;
- Provide direction and input to help our Chief and Council with decisions related to our Road; and
- Consult and engage our members, as well as neighbouring Indigenous communities.

The members of the Project Team are:

- Lawrence Baxter, Senior Community Member Advisor;
- Bob Baxter, Senior Community Member Advisor;
- Qasim Saddique, Project Director; and
- Jennifer Bruin, Technical Lead.

3.3.1 Contact Information

The main contacts for questions about our Road are:

- Chief Bruce Achneepineskum
- Qasim Saddique
  Project Director
  c/o Marten Falls First Nation
  General Delivery
  Ogoki Post, Ontario P0T 2L0
  Telephone: 1-800-764-9114
  Email: eaisinput@martenfallsaccessroad.ca

We retained AECOM Canada ULC (AECOM) to support us with our Road. They are tasked with the preparation of the Environmental Assessment / Impact Statement and the preliminary design. Their contact is:

- Kyle Hampton
  Project Manager
  189 Wyld Street, Suite 103
  North Bay, Ontario P1B 1Z2
  Telephone: 1-800-764-9114
  Email: eaisinput@martenfallsaccessroad.ca
- Ingrid Trimble
  Senior Environmental Engineer
  105 Commerce Valley Drive West
  Thornhill, Ontario L3T 7W3
  Telephone: 1-800-764-9114
  Email: eaisinput@martenfallsaccessroad.ca

3.4 Project Management and Decision Making

Day to day activities relating to advancing the submission of the eventual permitting of our Road are managed by the Project Team. The preparation of this Environmental Assessment / Impact Statement required inputs from consultants such as engineers and various technical disciplines. In 2018, a Request for Proposal was issued to identify consultants to support us with the engineering design for our Road, consultation efforts and preparation of this Environmental Assessment / Impact Statement, with inputs from different technical discipline specialists.

The Project Team is tasked with managing and guiding the consultants, dealing with project financials, responding to project inquiries and reviewing technical documents among other tasks. The Project Team is also tasked with providing the Community and Chief and Council with regular updates and next steps. They work with the technical discipline specialists and engineers to find a way to share data and information with Marten Falls First Nation in such a way that we stay informed.

The power to make major decisions resides with the Community and Chief and Council. This includes, for example, the approval of the Preferred Route of our Road and approval of the Final Environmental Assessment / Impact Statement. In these events the Project Team works with the consultants and engineers to prepare a recommendation or deliverables. These are then shared with the Community for feedback. The recommendation or deliverables are updated depending on the Community's guidance; and then presented to Chief and Council, who in turn issue a Band Council Resolution to move our Road forward.

3.5 The Seven Grandfathers

> The names of our rivers, lakes, and places that we named in our language should be kept traditionally, as it is our connection to the land and identity for future generations to come. Because behind every name there's a story.
> — **Rosie Achneepineskum**

Mino-bimaadiziwin (living a good life) is the original set of instructions given to us by the Creator for how to live a good, balanced, and healthy life. Through mino-bimaadiziwin we have a reciprocal relationship with the land, plants, and animals, which are all gifts from the Creator. Respect for all of Creation must be maintained, and we will be treated and provided for in kind by the Creator. Mino-bimaadiziwin includes respecting and providing for all living beings.

By treating the land and all living beings with respect and never taking more than we need, we help to make sure that the generations that follow us are provided for.

To help guide us, the Seven Grandfathers teaching was given to us by the Creator as the values by which we should live our lives (Seven Generations Education Institute, 2021). Each of these values are intricately connected, and should not be viewed as an individual, standalone principle. The sum of these values is the framework that informed our Road's Environmental Assessment / Impact Statement.

The Seven Grandfathers are spirits who watch over the Anishinaabeg and provide us with the following seven teachings:

1. Debwewin

Debwewin, or **truth**, refers to our lived experiences and how we must speak truth to our experiences.

The people of Marten Falls First Nation used to live their lives freely on the land, fishing, hunting and trapping according to the seasons. There were many paths across the landscape that they travelled. The arrival of missionaries to our lands marked a time of significant change in the Community. It became increasingly difficult for us to practice our culture. We used to honour the Creator through drumming and ceremonies, but missionaries and the government banned these practices.

Residential schools further destroyed our way of life through assimilation. Children were forced to go to schools as far away as Fort Albany, Dryden, Kenora, Sault Saint Marie, and Sioux Lookout, and were not allowed to

practice their cultures or speak their languages in residential schools. Abuse and neglect were rampant. Children were spiritually, physically, mentally, and sexually abused by teachers and school administrators, who often included clergy members. Many children died from the trauma inflicted at residential schools and lack of basic medical care. The ongoing legacy of intergenerational trauma continues to affect the Community today.

The Community is struggling with a mental health crisis, as well as social and economic problems. The culmination of these makes connecting to the old ways of life harder to access. Despite the trauma inflicted by colonialism, the Community strives to persevere and honour the values taught to us by the Creator.

We view the construction of our Road as a means of economic reconciliation, so that our people have access to the broader region for better work opportunities, increased social cohesiveness, and easier, more affordable access to the goods and services that we need to thrive.

2. Dabasendiziwin

Dabasendiziwin is the principle of **humility**. We view the preparation of the Environmental Assessment / Impact Statement as a process steeped in humility, as we seek to tell a story about the existing conditions of the social, cultural, economic, built, and natural environments in which we live, and plan our Road in a way that honours those findings, spanning across all disciplines included in the water, land, and people categories.

Our Road considers the possible positive and negative effects to the existing environment, health, social, and economic conditions, and provides mitigation of adverse effects, and effects on our own Community and other Indigenous peoples.

Indigenous Knowledge has guided this process, and informed the selection of the route.

3. Manaaji’idiwin

The teaching of manaaji’idiwin tells us that we must **respect all other beings** that are a part of Creation. This includes the land, the water, plant life, wildlife, insects, and other people. As Anishinaabeg, we are taught to take care of the land, and take only what we need. This teaching is our own built-in form of sustainability and makes sure that the natural world remains healthy and thriving, and the generations ahead of us will have what they need to survive.

Our Road is vital for upholding our Community to sustain itself by connecting us to the goods and services that we need to survive, and in doing so, promoting the social and economic well-being of our people.

This includes:

- Selecting a route that minimizes impact on the environment and people;
- Assessing all aspects of our Road as holistic and interrelated. The Environmental Assessment / Impact Statement categorizes the disciplines as water, land, or people, and views these categories and the disciplines within them as linked; and
- Recommending monitoring and mitigation measures.

4. Zaagi'idiwin

The teaching of zaagi'idiwin is about **unconditional love** for one another. Our Community is currently facing a mental health crisis that dramatically impacts social cohesiveness, in part due to the lack of access to Marten Falls.

Many community members make the difficult choice to move to nearby communities for employment or education, knowing that visits home will be limited without easy and affordable access to the Community. This is especially true for our youth, who must move to Thunder Bay or Geraldton for their high school years. Our Road signifies freedom for our Community, and a better chance for our youth to have a good life. It represents an opportunity for our people to more easily gather in love and ceremony, while also have the chance to explore pursuits beyond the Community. It will also allow our people to more readily access medical services, which is becoming increasingly more vital with the mental health crisis in our Community.

5. Gwayakwaadiziwin

Gwayakwaadiziwin refers to **virtue**, or **honesty**. We aimed to be transparent throughout the Environmental Assessment / Impact Statement, and for our Road to consider the water, land, and people disciplines. We shared information on our Road through the Consultation and Engagement Program. It was designed around the following guiding principles:

- Kawininitojikateg nikan onajikewining ineke: the Anishinaabe relationship to the land should be seen as a cultured landscape; also an area that is continuously being used by the Anishinaabe as a habitation and as a resource;

- Kezhikanawabajikateg kaye ji tepwaaniwaang kekikinozhiwemakaang: everything on our land and in the water is living being and needs to be respected;
- Kakina ji wiinda mawa nowaht anishinabek ka onjiwatch: engage the Anishinabek on all issues that affect our shared and communal lands;
- Jih ishi kanawejikatey kakina kekon: respecting the natural and Anishnaabe customs and teachings at all times; and
- Chi Mamow waban ji kateg emishiinonaniwang mashkawisiinaniwang: looking at it together. In numbers there is strength.

Indigenous communities to be consulted throughout the life of the Marten Falls Community Access Road Project were identified by the Ministry of the Environment, Conservation and Park and the Impact Assessment Agency of Canada (the Agency).

These communities were invited to participate in the Consultation and Engagement Program through a range of activities, including meetings with the Project Team and consultants, Public Information Centres, online webinars, the Project website, monthly e-blasts, and field program updates.

Additionally, communities were given project-related information and invited to participate at various points to inform and guide the process of preparing the Environmental Assessment / Impact Statement. Indigenous Knowledge Sharing Agreements were established to grant communities control over how the knowledge they shared with the Project Team would be used in the Environmental Assessment / Impact Statement. Two Aboriginal and / or Treaty Rights and Interests forums were also held.

6. Zoongide'ewin

Zoongide'ewin is the concept of **courage**. Our Community has faced several challenges that have posed serious threats to our way of life, and to the health and well-being of our community members. We have persevered despite these challenges, and we seek to provide a better way of life for our people. The process of preparing regulatory submissions has often excluded or misrepresented Indigenous voices, and requires coerced co-operation with various levels of a colonial government that has done us significant harm.

Our Road is a unique opportunity for our Community to frame the Environmental Assessment / Impact Statement in a way that represents us and honours our knowledge.

We achieve this by applying a First Nations lens not only to the methodology for our data collection, but also to the order in which this information is presented. Indigenous Knowledge was given equal weight to western scientific knowledge, and communities were given autonomy over how their knowledge was shared through the Indigenous Knowledge Sharing Agreements. Additionally, Indigenous field assistants were hired for field programs as a means of teaching local youth about environmental existing field-based data collection practices, while also teaching researchers about our ways of life on the land. This reciprocal lens required that data was treated as inherently holistic, rather than being viewed as distinct, discrete points. To emphasize the interconnectivity of the technical disciplines, they were sorted into three categories: water, land, and people. These categories were chosen to highlight the similarities of the disciplines within each but are assessed for their broader interconnections with all other aspects of our Road.

As regulatory submissions are often difficult to read for people who are not environmental practitioners, there was an emphasis on making this assessment accessible. Information and updates on milestones were made available in plain language fact sheet handouts at Public Information Centres and online. We also offered webinars and prepared videos to help disseminate information on the Community Access Road.

By applying our own lens to our Road's Environmental Assessment / Impact Statement, we are standing in the strength and integrity of our community values in an arena that more typically values a Euro-Canadian worldview.

7. Nibwaakaawin

Nibwaakaawin means **wisdom, or to have vision**. Ontario Chamber of Commerce and Canadian Council for Aboriginal Business defines economic reconciliation as, "pursuing meaningful, equitable economic opportunities and outcomes for Indigenous Peoples" (Beyer, 2023) Envisioning a path towards economic reconciliation that aligns with our values as Anishinaabeg is foundational to our empowerment. As part of this vision, we look to sustainable development that is framed and informed by Indigenous Knowledge, respecting the generational wisdom and sustainability principles

held by our people. The process of preparing the Environmental Assessment / Impact Statement has allowed us to carefully examine how our Road will interplay with all the water, land, and people considerations, and allows us to mitigate impacts in ways that continue to respect and honour our values. Economic reconciliation represents redress for past injustices, and signifies the Agency we have over our economic future. We strive to create a future in which our Community's needs are met, and our people can prosper and thrive; it is integral for our survival and sustainability.

The Seven Grandfathers teaching contains the core principles that guide our actions as Anishinaabeg. The lands we live on today are our ancestral territories, a place that has historically provided very well for us. However, we are facing unprecedented challenges regarding climate change, a mental health crisis, and access to education, essential goods and services. Our current winter access road is threatened with the prospect of shorter, less cold winters, meaning that many items essential to our survival must be flown into the Community and can be very costly. As a result, it is increasingly difficult to survive, and our Community faces challenges with rising costs, loneliness, and isolation that have resulted in a serious mental health crisis. Our Road represents hope, economic reconciliation, and a way to provide for the generations ahead; as Chief Bruce said (2023), "We are getting our house in order and setting up the future of our seven generations."

4. How We Selected Our Road

4.1 Choosing a Solution for Our Community

Marten Falls First Nation evaluated different options to connect the Community before selecting the Community Access Road as their preferred choice. The following provides a list of alternatives that were considered, and why they were rejected:

- **Continuing to operate and maintain a winter access road.** This has the disadvantage of being weather dependent. In addition to this, due to climate change it has become more and more unreliable and is occasionally only open for a few weeks before the ice becomes too thin again;
- **Continuing to operate the airport.** This is costly, and limited in its capacity. It does not offer daily flights, is also dependent on the weather, and charter planes cannot accommodate the transportation of building materials and equipment (large, heavy items); and
- **A railroad.** This would not offer freedom of movement, and therefore it did not meet the needs of the Community.
- **Road alternatives.** Four road alternatives were considered by Marten Falls First Nation: two generally following the route of the winter access road (referred to as Alternatives 2 and 3) and two located west of the winter access road (referred to as Alternatives 1 and 4). Based on feedback from Marten Falls members and the engineering team, the options were narrowed down to Alternative 1 and Alternative 4.

4.1.1 Do Nothing Alternative

The Community Access Road needs to comply with both provincial and federal requirements, this is described in more detail in **Section 5**. This section was prepared to comply with one of the provincial requirements, which is the evaluation of a do nothing alternative. This would mean that no Community Access Road would be constructed, and that Marten Falls would remain disconnected from the provincial highway network, continuing to only be accessible by air and the winter access road.

A number of Ontario provincial government planning documents have developed recommendations and priorities, which highlight the need for improved transportation connections in northern Ontario. Without the Community Access Road these would not be met. These plans include:

- Building Better Lives: Ontario's Long-Term Infrastructure Plan (Ministry of Infrastructure, 2017) identifies the Community Access Road and notes that the Province of Ontario (the Province) is working with Marten Falls First Nation to

plan and construct an all-season access road connecting the Community to the existing highway network. It also notes that building the Community Access Road is part of the government's commitment to create jobs, provide long-term benefits and improve the quality of life for people in the region.

- The Growth Plan for Northern Ontario (Ministry of Infrastructure and Ministry of Northern Development, Mines and Forestry, 2011) outlines the Province's commitment to work with remote communities for improved access.
- The Province has also committed to developing regional transportation plans to keep goods and people moving across the province. Regional planning is underway for northern Ontario (Phillips, 2019).

Not proceeding with the Community Access Road will not address the recommendations or priorities of Ontario's Long-Term Infrastructure Plan (Ministry of Infrastructure, 2017) or the Growth Plan for Northern Ontario (Ministry of Infrastructure and Ministry of Northern Development, Mines and Forestry, 2011) for improved access for remote communities. It would also not meet the commitment from Ontario to plan and construct an all-season access road connecting Marten Falls to the highway network (Marten Falls First Nation, 2017a).

Without the Community Access Road, Marten Falls First Nation will continue to rely heavily on air delivery of food, fuel and other goods and supplies needed to sustain community life, which comes with high costs. The increasing unreliable access via the winter access road will put additional strains on delivery of large goods including building supplies, appliances and equipment. The Community has also identified constraints to opportunities for employment, business, and related economic and social development as a result of dependence on air transportation (Marten Falls First Nation, 2017a). It is possible that doing nothing could eventually make the Community unhabitable. It would isolate Marten Falls First Nation community members more as the effects of climate change continue to evolve. It could also make the Community unattractive for future generations.

In addition to impacts to Marten Falls First Nation, without the Community Access Road it would not be possible to develop proposed mineral projects in the far north that the Province has indicated its support for.

While the Community Access Road will result in some environmental impacts as described in **Sections 9** and **10**, with the recommended mitigation, the Project Community Access Road is considered to be justified considering the expected benefits. As a result, the do nothing alternative is not being recommended for consideration.

The best solution is an all-season access road. It will make Marten Falls First Nation more resilient, less vulnerable to climate change, grant freedom of movement and flexibility, and is a less expensive alternative compared to transportation by air.

The first road we made from the Community to Nakina was a snowmobile trail back in the early 80s. The plan for that was to bring some stuff for the Community—stuff that we couldn't bring on the plane during the summer. So that didn't work. The skidoo was not enough power to bring heavy stuff.

So, we move on to a tractor train to Nakina, and that took too long because it took about 36 hours away to get to the other end, from here to Percy Lake, to haul the stuff. We made only three trips per year, and that was not enough for our community needs. A tractor train is a bulldozer that ties up the sleigh with the freight behind, and that could carry a lot of pounds. That didn't help us that much because it was too slow. We only could do limited trips per year, so we have to wait for the next year to bring the rest of the stuff. So it got delayed.

So we got the vehicle road, the winter road, what we have now. And that's not working either. We only use it 2 months to 3 months, depending on how the cool and warm weather comes in, and it's rapidly coming in early for the past 5 years due to the global warming. We only could use the winter road for 2 months. That's it. And we don't have enough time to haul the freight.

You know, Chief Eli is the one that started the snowmobile route and the tractor route, and part of this route that we have today to haul the stuff. And that's where we are now, all-season road coming. Meanwhile, we try to keep using what we have now, that winter road with driving vehicles. Traffic is heavy on the weekend, especially when the big trucks start to haul stuff. You don't see them until you're in a corner. At least if you have lights, you see them at a distance. Most people prefer to use heavy trucks. They let us know when those trucks are coming in, so we watch out for them. So in March, when it gets warmer, we travel at night, so the road is frozen solid, which is good. — **Russell Achneepineskum**

4.2 How Alternative Routes were Identified

Before requesting approval to construct and operate the Community Access Road, alternatives to be considered had to be approved by the provincial Terms of Reference and the route it should follow had to be identified. A report outlining efforts between 2007 and 2020 to identify potential routes was prepared in 2020 (AECOM, 2020a).

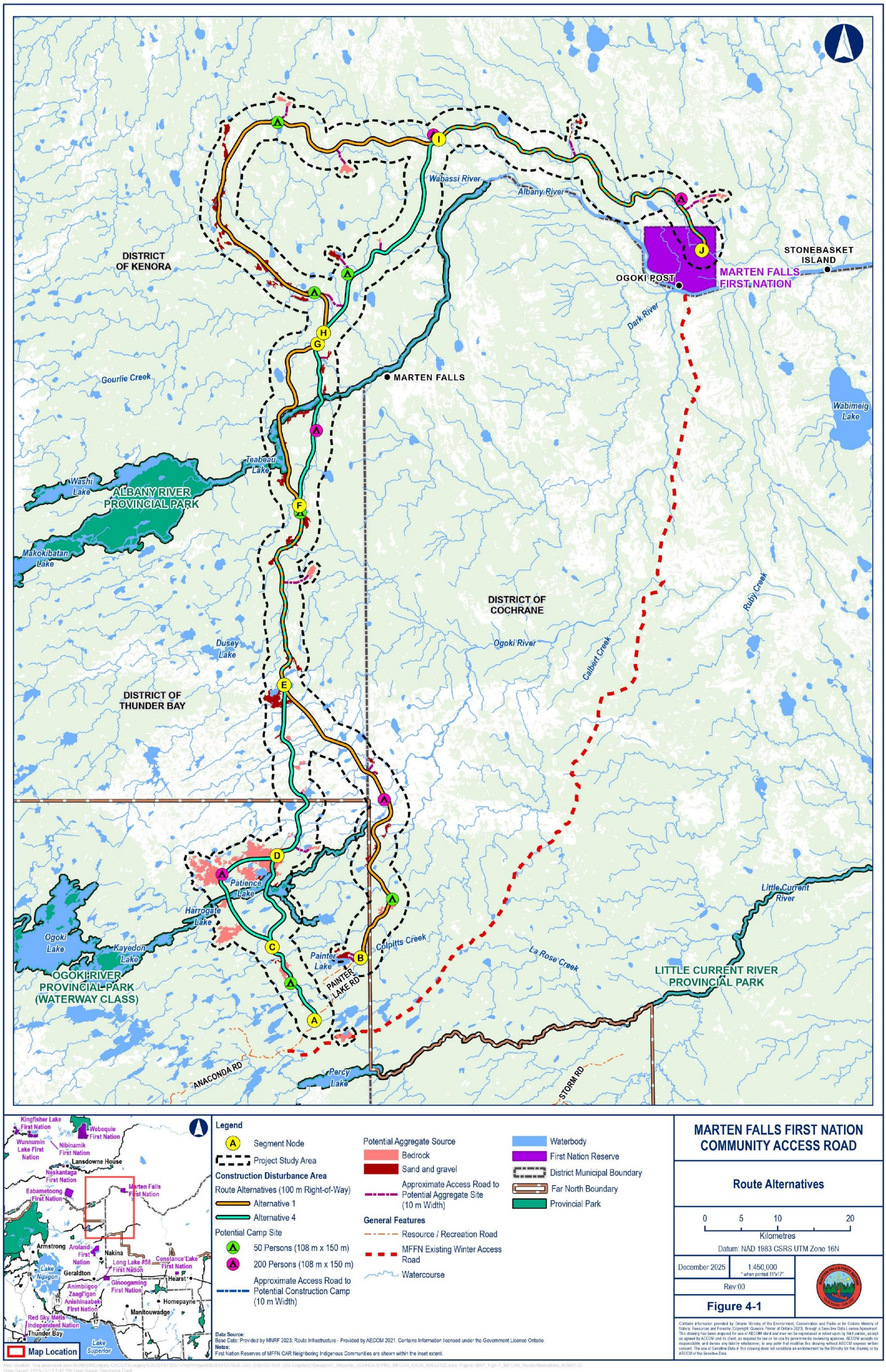
Table 4-1 presents a summary of these efforts and gives an overview of how the two alternative routes to be evaluated were selected and how the Preferred Route was chosen. The resulting alternatives are referred to as Alternative 1 and Alternative 4 and are shown on **Figure 4-1**.

Each alternative starts at Painter Lake Road and runs north approximately 130 kilometres before turning eastward towards Marten Falls, roughly following the west / north side of the Albany River.

Table 4-1: Summary of Alternative Development

Date	Activity
2007 to 2009	• Matawa First Nations Tribal Council, on behalf of Marten Falls First Nation, investigated opportunities to realign and improve the winter access road used. The study focused on the safety, environmental and operational deficiencies of the winter access road identified by community members. The results of the study concluded that the winter access road should be realigned to higher ground for future potential upgrade for all-season uses.
2009	• Marten Falls First Nation secured funding to assess the feasibility of a winter access road realignment and / or construction of a new all-season access road. Marten Falls First Nation also considered how to maximize economic opportunities and job creation for them in road construction and maintenance, as well as for future development.
2016 to 2017	• Marten Falls First Nation secured provincial funding to research and explore options for connecting the Community to the existing provincial transportation network with an all-season road. Before being allowed to construct the Community Access Road permits and approvals will be needed, which are also covered under the provincial funding. • As advised by Marten Falls First Nation Chief and Council, a Project Team was established to identify potential routes for the Community Access Road based on the findings of previous studies.
2017	• The identification of a preliminary preferred route (which had been identified by Marten Falls First Nation) was based on the understanding that the Community Access Road would be for community access only. The potential routes were presented in January and March 2017 to the Community for feedback and input.
Spring 2017	• A proposal was submitted to the Province. The intent of it was to determine next steps. Following review of the proposal, the Province entered discussions with Marten Falls First Nation about funding, during which the Province disclosed that funding would only be available for a single multi-purpose all-season access road.
August 2017	• Ontario announced that the Province would provide funding to plan the all-season road access to the Ring of Fire, and that as part of this plan they would work with Indigenous communities, including Marten Falls First Nation, to build all-season access roads to communities. • Following the announcement, a meeting was held with the Community to introduce the idea that the Community Access Road would need to be a multi-purpose road to obtain provincial funding.
Early 2018	• Marten Falls First Nation community members were consulted to obtain input on values and features of importance, and feedback related to the change of the road use from strictly community-based to multi-purpose. The additional community consultation and outreach efforts resulted in the development of four potential route alternatives.
August 2018	• Request for Proposal for Environmental Assessment and Preliminary Design Services for the Community Access Road was released.
Late 2018	• Following release of the Request for Proposal, the routes were further refined. Portions were realigned to avoid valued / sensitive features and in some cases, sections were removed from consideration; this was done in collaboration with engineers and consultants. The changes were primarily due to the Anishinabek Knowledge presented in the community-based land use planning process. • Consultation events took place in November 2018 in Marten Falls and Thunder Bay. The purpose of the events was to provide an update on ongoing studies and review the route mapping with existing Anishinabek Knowledge. Revisions were made based on input received. • A detailed review of the alignment of each route against aerial imagery also resulted in minor modifications to avoid large lake and wetland crossings.
March 2019	• Notice of Commencement of Terms of Reference were advertised on Wawatay Radio and published on the Geraldton Times Star, Chronicle Journal, Thunder Bay Source, Wawatay News, TBNewsWatch, Windspeaker, and Anishinabek News. • The Notice of Commencement included four potential route alternatives. These four routes were shared through consultation as potential alternatives that would be reviewed to confirm the reasonable range of alternative methods for assessment and evaluation.
July 2019	• Feedback received from Marten Falls First Nation community members and Chief and Council determined that only Alternative 1 and Alternative 4 would be considered. On July 31, 2019, Marten Falls First Nation signed a Band Council Resolution to only consider Alternative 1 and Alternative 4 moving forward in the environmental assessment process. The Terms of Reference prepared as part of the Community Access Road includes a supporting document that presents the historical development of alternatives (AECOM, 2020b).
June 2020	• While investigating construction feasibility of the two routes, a newly identified potential crossing location of the Ogoki River for Alternative 4 was identified to the west.

Figure 4-1: Route Alternatives



4.3 Our Route Alternatives

The Project Team worked with the technical experts and engineers to find a way to share the data with Marten Falls First Nation in such a way that Marten Falls First Nation could make an informed decision.

4.3.1 Dividing the Alternatives into Segments

The Alternative 1 and Alternative 4 routes run parallel, overlap, and cross each other at multiple locations. To simplify the evaluation of Alternative 1 and Alternative 4, these were divided into three separate segments based on their geographic location (**Figure 4-2**). Dividing Alternative 1 and Alternative 4 into segments gave Marten Falls First Nation the flexibility to choose any alternative in any segment. This means that Marten Falls First Nation did not have to choose either Alternative 1 or Alternative 4, but that they could choose the alternative which made the most sense for each segment.

- Segment 1 – Ogoki Crossing (**Figure 4-3**) is located at the south end of the proposed road. Alternative 1 and Alternative 4 start at Painter Lake Road and consider crossing the Ogoki River;
- Segment 2 – Albany Crossing (**Figure 4-4**) is located by Albany River Provincial Park and considers crossing the Albany River; and
- Segment 3 – North of the Albany (**Figure 4-5**) is located north of the Albany River and turns eastward toward the Community.

Where the two alternatives overlap, for example, between Segment 1 and Segment 2, no alternatives were developed as both alternatives will use the same route.

Figure 4-2: Route Alternative Segments

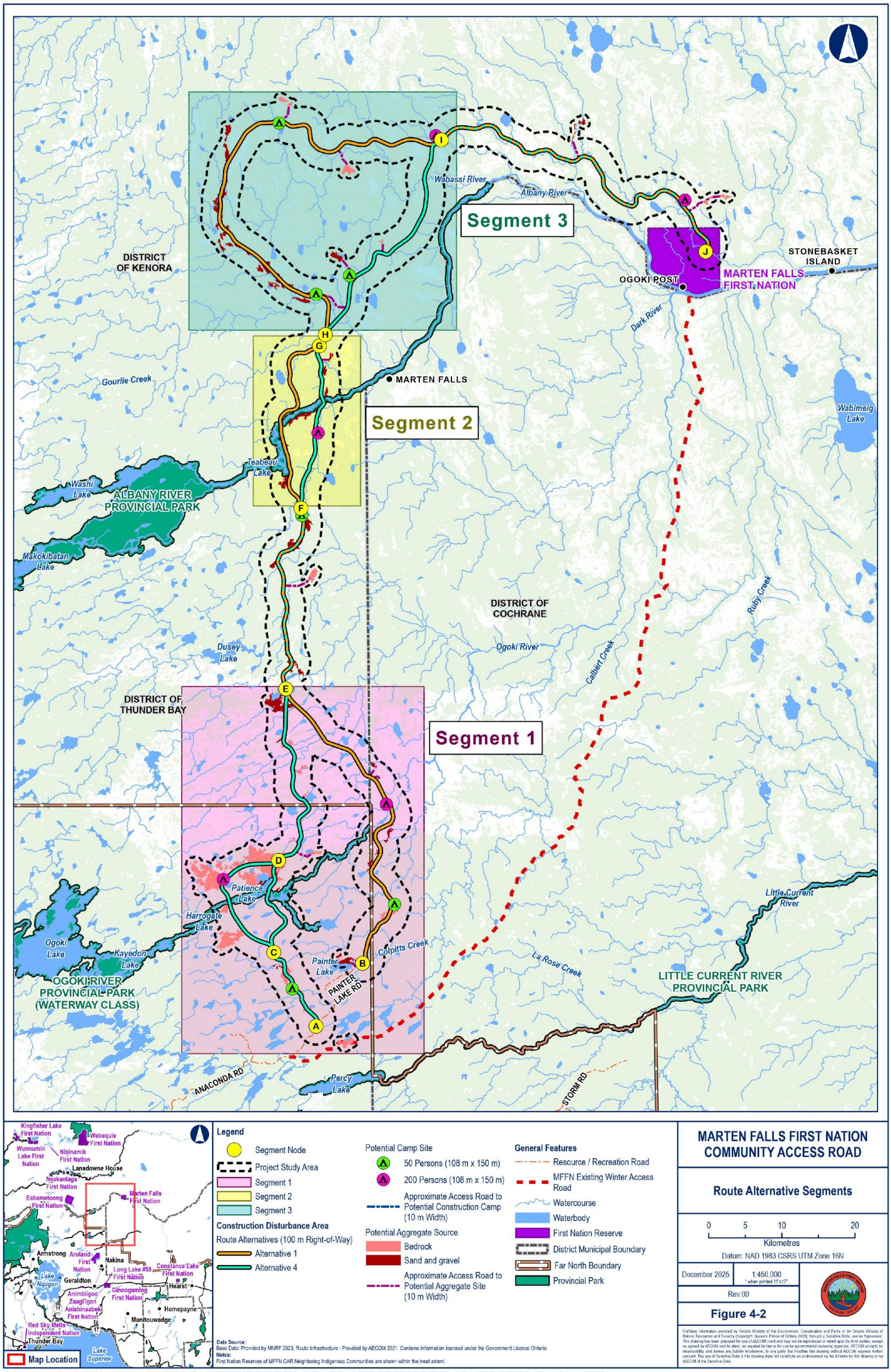


Figure 4-3: Segment 1 – Ogoki Crossing

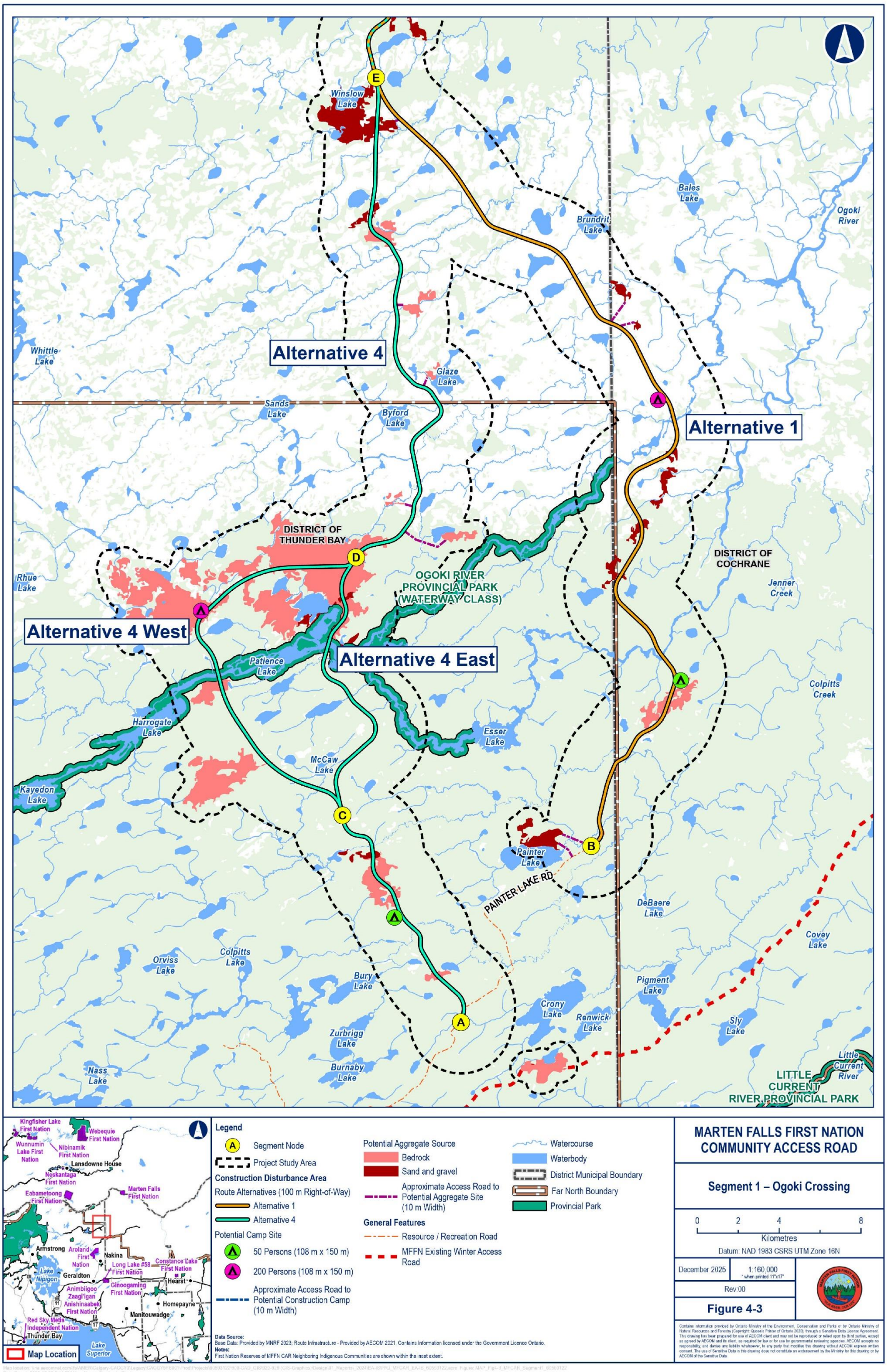


Figure 4-4: Segment 2 – Albany Crossing

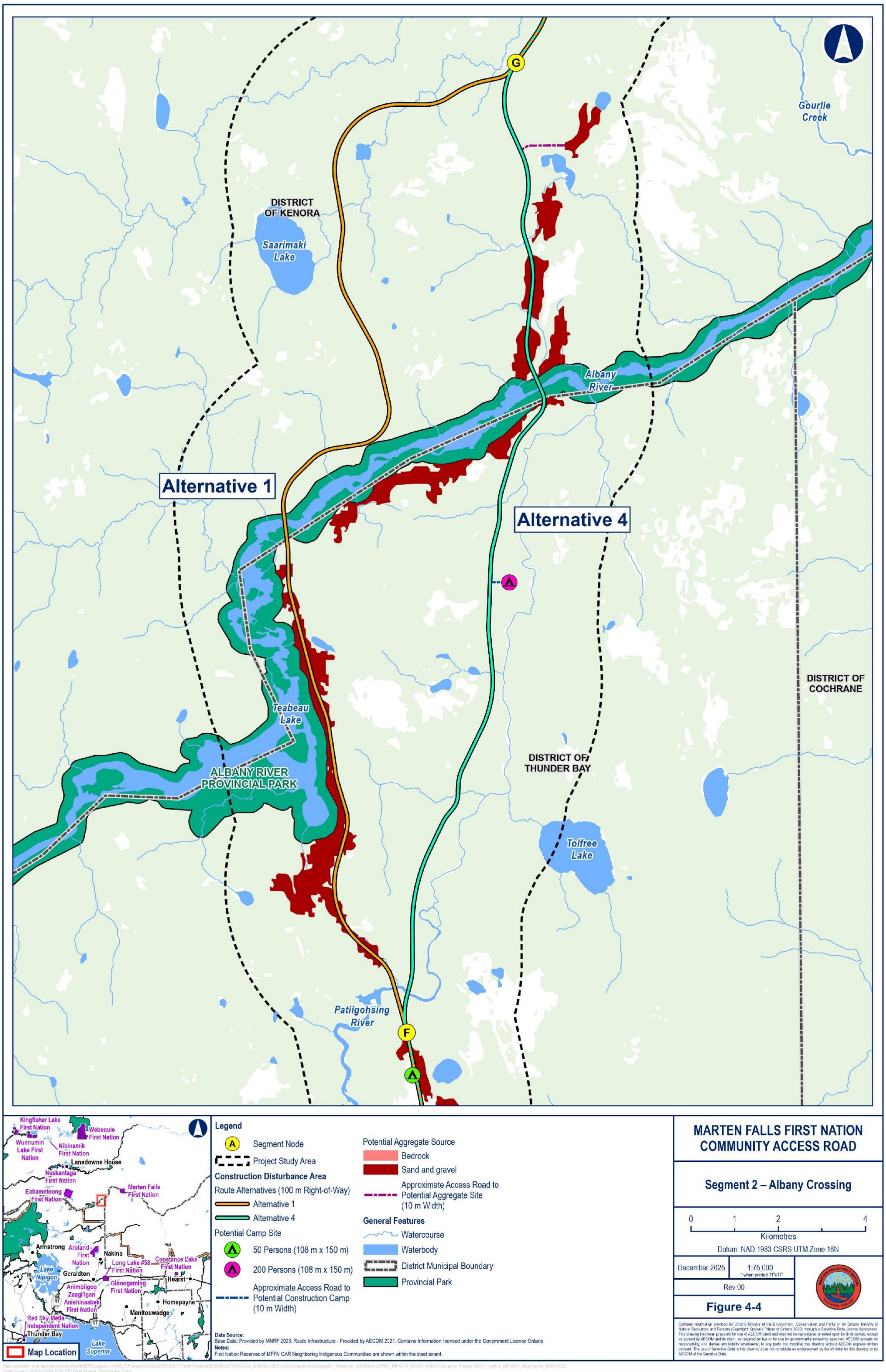
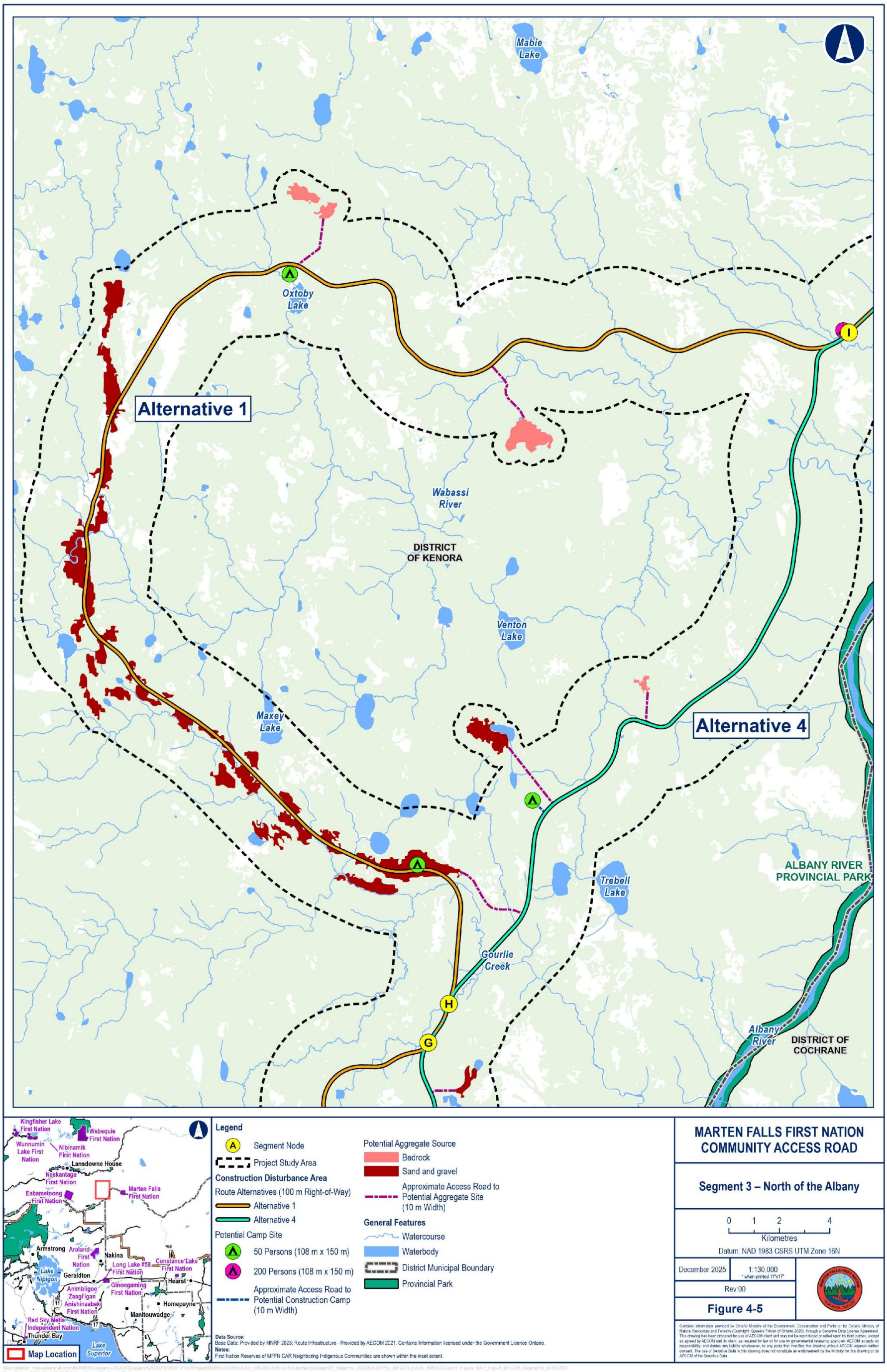


Figure 4-5: Segment 3 – North of the Albany



4.3.2 Metrics to Help Identify a Preferred Route

Technical discipline specialists had been collecting data for their areas of expertise for several years to understand the existing conditions of the natural, socio-economic, and cultural environments, as well as to help with engineering. In the summer of 2023, the technical discipline specialists were asked to consider the data available to them, identify only the metrics that would help identify a preferred alternative and complete a comparative analysis. These tables and the methodology used to complete the analysis is included in **Appendix A** and **Appendix B**, respectively.

Table 4-2 and **Table 4-3** provide an overview of the metrics the technical disciplines considered in their analysis. The construction of each route alternative will require the local extraction of sand, gravel, and bedrock. Some of these materials are readily available along Alternative 1 and Alternative 4, while in other cases, temporary access roads will need to be constructed to support aggregate extraction. Therefore, the evaluation of each route alternative also considered the sand, gravel, bedrock, and associated temporary infrastructure required for construction.

Table 4-2: Categories, Factor Groups, and Factor in the Route Alternative Evaluation

Category	Technical Discipline / Factor Groups	Metric / Factors
Marten Falls First Nation community feedback / Indigenous Knowledge	Aboriginal and / or Treaty Rights and Interests	• Indigenous current use of lands and resources for Traditional purposes • Cultural continuity and well-being (ability to practice and transmit cultural traditions)
Water	Fish, fish habitat	• Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, Burbot
Water	Groundwater and geochemistry	• Groundwater
Water	Peatlands	• Peatland ecosystems
Water	Surface water	• Surface water
Land	Physiography, terrain, and soils	• Physiography, terrain, and soils
Land	Ungulates	• Moose • Caribou
Land	Wildlife	• Bats • Furbearers • Amphibians and reptiles • Wolverine • Species at Risk wildlife including pollinating insects
Land	Vegetation	• Wetland and riparian ecosystems • Upland ecosystems • Traditional use plants and Species at Risk plant populations
Land	Birds	• Species at Risk forest and wetland birds • Raptors • Shorebirds • Waterfowl
People	Acoustic and vibration environment	• Acoustic and vibration environment
People	Atmospheric and greenhouse gas	• Air quality and greenhouse gas
People	Cultural Heritage	• Archaeological sites and resources • Built Heritage resources / cultural heritage landscapes
People	Community Well-Being	• Economic – regional economy • Human health and community safety - public safety • Human health and community safety -environment factors influencing human health • Socio-community
People	Land and resource use	• Land use compatibility • Parks and protected areas • Recreation and tourism • Extractive industry • Forestry industry • Remote outfitters • Trapping
People	Visual	• Visual
People	Climate adaptation and resiliency	• Climate adaptation and resiliency

Table 4-3: Technical, Engineering, and Cost Criteria

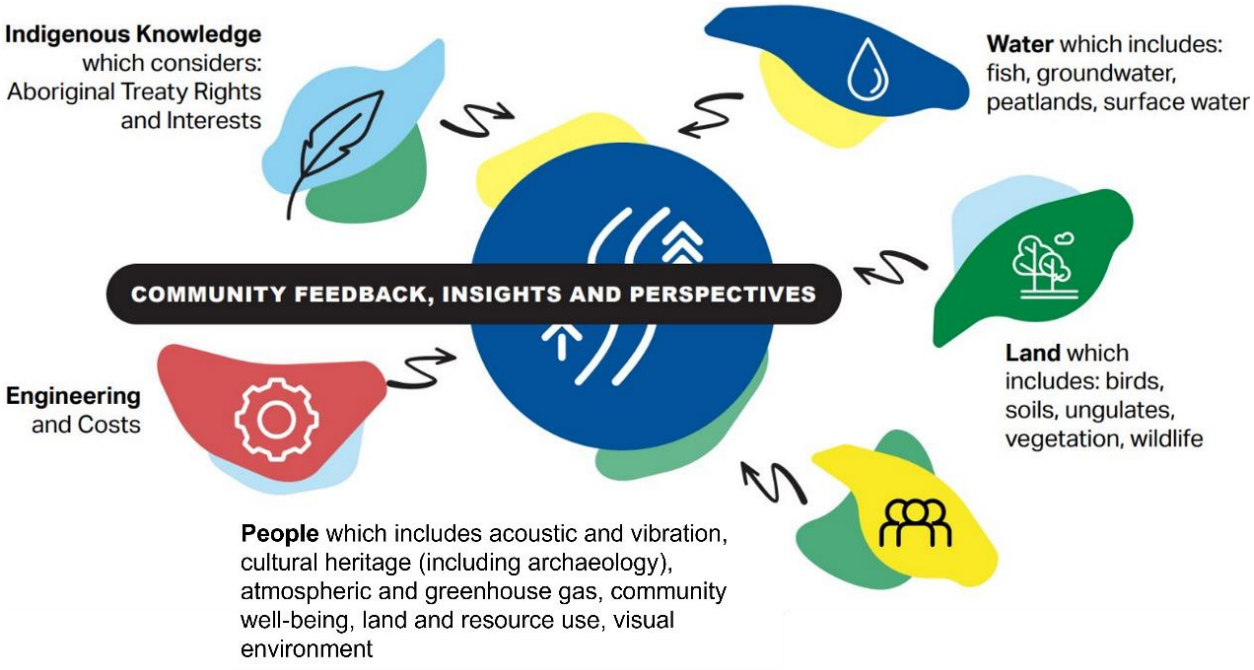
Metric / Factor	Indicator
Design	• Roadway alignment length • Number of water crossings • Length of water crossings
Construction Complexity	• Access to roadway material • Constructability of roadway • Constructability of water crossing
Miscellaneous	• Schedule implications
Operations	• Long-term maintenance
Cost	• Value of construction

4.3.3 Presenting Findings

The tables containing the metrics and comparative analysis incorporated all the data collected by the technical discipline specialists. The Project Team and the consultants had to find a meaningful way to organize and share this with Marten Falls First Nation community members, Chief and Council, other Indigenous communities, and the public to gather feedback, given that it is over 80 pages of information (**Appendix A**).

The technical analysis and data were grouped and summarized into the categories of water, land, and people to better resonate with Indigenous communities. It included feedback previously received from Marten Falls First Nation and collected Indigenous Knowledge, as well as information from engineering. Maps of each segment and summary tables were shared with Marten Falls First Nation community members, Chief and Council, other Indigenous communities, and the public. **Figure 4-6** shows how the inputs of Indigenous Knowledge, water, land, people, and engineering, with Marten Falls First Nation at the centre, contributed to the route selection process and final decision.

Figure 4-6: Inputs of Indigenous Knowledge, Water, Land, People and Engineering



4.3.4 Gathering Feedback

Table 4-4 presents a summary of how and when feedback was collected and how it influenced the selection of the Preferred Route. It does not include feedback on other topics, as this section focuses specifically on how inputs for selecting the Preferred Route were gathered. More detailed information about the feedback received is provided in **Section 11**.

Table 4-4: Consultation on Route Selection

Date	Event	Comments
November 2, 2022	In-Community Public Information Centre #4 at Marten Falls	• Existing conditions data was still being gathered. Technical disciplines had not completed an analysis or provided a recommendation on a preferred alternative. • Small-scale maps of the alternatives were shared, as well as available Indigenous Knowledge. • The Community shared feedback on their initial thoughts on their preferred alternative for each segment.
December 6, 2022	Marten Falls First Nation community members only Public Information Centre #4 held in Thunder Bay	• Existing conditions data was still being gathered. Technical disciplines had not completed an analysis or provided a recommendation on a preferred alternative. • Small-scale maps of the alternatives were shared. • No comments were received on the selection of route alternatives.
December 7, 2022	Public Information Centre #4 held in Thunder Bay	• Existing conditions data was still being gathered. Technical disciplines had not completed an analysis or provided a recommendation on a preferred alternative. • Small-scale maps of the alternatives were shared. • No comments were received on the selection of route alternatives.
December 8, 2022	Public Information Centre #4 held in Geraldton	• Existing conditions data was still being gathered. Technical disciplines had not completed an analysis or provided a recommendation on a preferred alternative. • Small-scale maps of the alternatives were shared. • No comments were received on the selection of route alternatives.
October 23, 2023	Marten Falls First Nation Chief and Council meeting (virtual)	• All technical disciplines prepared a preliminary recommendation on a preliminary technically preferred route for each segment. This was shared through summary results tables and small-scale maps for each segment. • The results provided a preliminary technical recommendation, which was developed using western science, focusing on the available natural science, engineering, and social science information. • Indigenous Knowledge reports had not been received at this time. The Marten Falls First Nation Indigenous Knowledge report was received in November 2023. • Marten Falls First Nation community members and Chief and Council shared feedback on the preliminary recommendation. • Marten Falls First Nation community members were very engaged in providing feedback at the in-community presentation. • The feedback focused on Segment 2. The preliminary technical recommendation identified Alternative 1 as the preliminary technically preferred route. This alternative parallels and crosses the Albany River, while Alternative 4 only crosses it. Marten Falls First Nation community members and Chief and Council members expressed concerns with Alternative 1 as the Albany River is very important to Indigenous communities.
October 23, 2023	Marten Falls First Nation community members only Public Information Centre #5 held in Thunder Bay	• Same as previous
October 24, 2023	In-Community Public Information Centre #5 at Marten Falls	• Same as previous
October 25, 2023	Public Information Centre #5 held in Thunder Bay	• The preliminary recommendation for each segment was shared. • The public shared feedback on the preliminary recommendation.
October 26, 2023	Public Information Centre #5 held in Geraldton	• The preliminary recommendation for each segment was shared. • The public shared feedback on the preliminary recommendation.
November 10, 2023	Meeting with Long Lake #58 First Nation	• The preliminary recommendation for each segment was shared. • No feedback shared.
November 16, 2023	Webinar on Route Selection (webinar was open to the general public)	• The preliminary recommendation, specifically for Segment 2, was updated based on the feedback received in October 2023 (the updated route). • Attendees shared feedback on the updated route.
November 21 to 23, 2023	Aboriginal Treaty Rights and Interests Forum	• The updated route was shared. • Attendees shared feedback.

Date	Event	Comments
January 16, 2024	Nibinamik First Nation	• The updated route was shared. • Attendees asked questions related to migratory birds, moose, Black Ash / Black Spruce, the Regional Assessment, air pollution, impacts of new or increased access to the area by outsiders. and spill response.
June 5, 2024	Weenusk First Nation	• The updated route was shared. • No feedback shared.
June 20, 2024	Long Lake #58	• The updated route was shared. • Attendees expressed interest in road construction methods and timelines, operation and maintenance of the road and shared concerns regarding the impacts of new or increased access to the area by outsiders.
June 19 and 20, 2024 July 15 and 16, 2024	Meetings with Aroland First Nation	• The updated route was shared. Feedback from Aroland First Nation members on it was recorded. • General support on the updated route from Aroland First Nation. • Concerns regarding safety were noted. The Project Team responded by stating that safety is being considered as part of the Community Access Road.
July 17 and 18, 2024	Marten Falls First Nation	• The consultants used the feedback received from Marten Falls First Nation on October 23 and 24, 2023, regarding the updated route to prepare the Preferred Route recommendation. • The Preferred Route recommendation was shared with Marten Falls First Nation community members and their Chief and Council.

4.4 Our Preferred Alternative

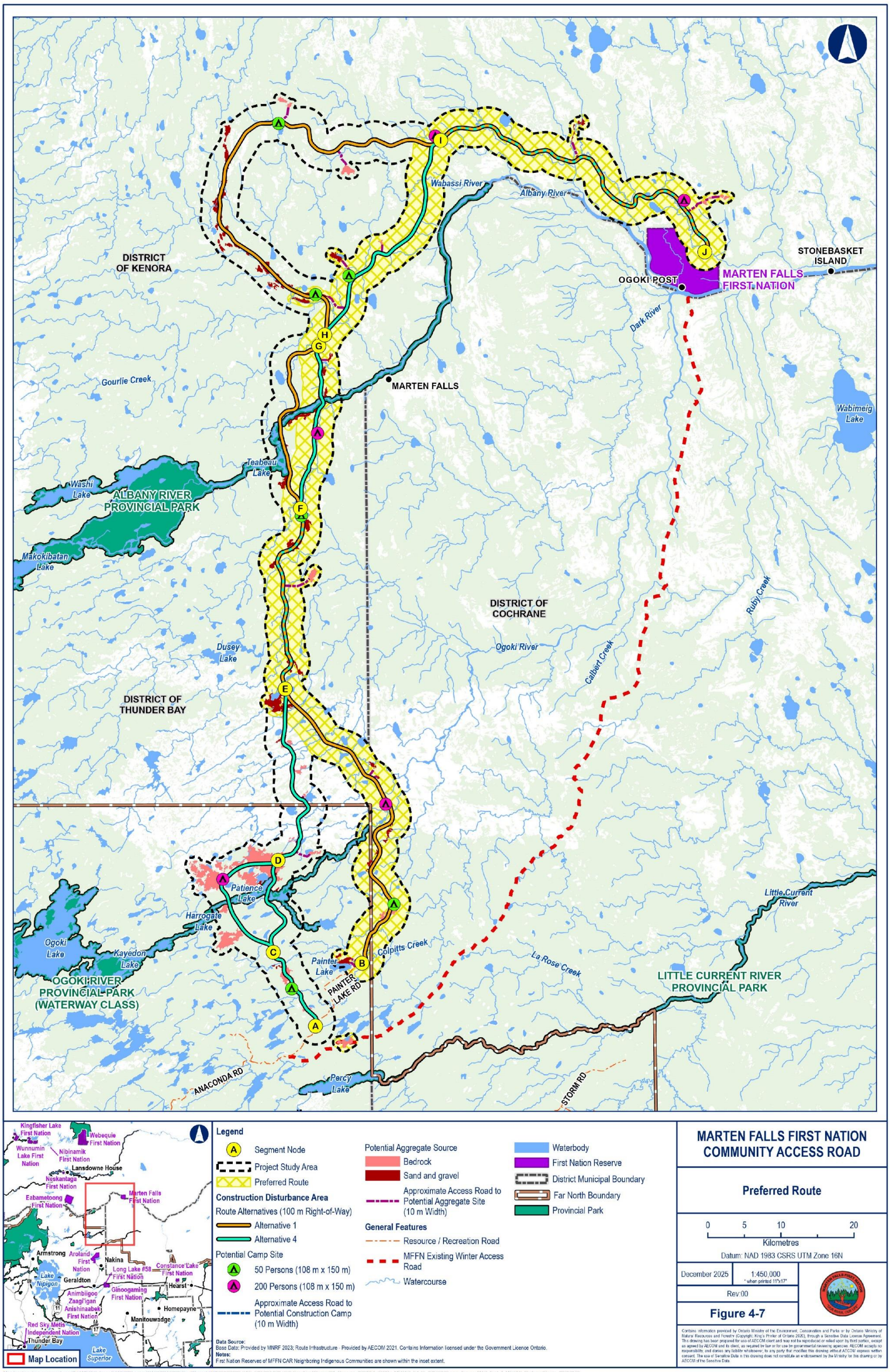
As described in the previous section, results and recommendations were shared with Marten Falls First Nation community members, Chief and Council, other Indigenous communities, and the public. The recommendations were revised based on the feedback received. All of this informed the Preferred Route recommendation presented to Marten Falls First Nation Chief and Council for their consideration. A Band Council Resolution supporting the Preferred Route, as shown on **Figure 4-7**, was signed on August 26, 2024.

Sections 4.4.1 to 4.4.3 present the information associated with the Preferred Route recommendation. This information consists of maps, associated summary tables, and a brief justification why each alternative was chosen over others.

4.4.1 Segment 1 – Ogoki Crossing

The road begins in Aroland First Nation's traditional territory as it goes north. The traffic resulting from the Community Access Road also ends up on Aroland First Nation's traditional territory. For these reasons, Marten Falls First Nation Chief and Council wanted to make sure that the comparative analysis of alternatives was shared with Aroland First Nation members, and the community was broadly engaged and consulted on the comparative analysis to make sure that their feedback was incorporated into the decision. This resulted in several meetings with Aroland First Nation members both on-reserve and off-reserve in Thunder Bay (Progress Report 3: Identification of the Preferred Alternatives Milestone – Aroland First Nation; AECOM, 2024c). In those sessions the Project Team shared the technical analysis, the updated route, and then finally Marten Falls First Nation's Preferred Route. Aroland First Nation members provided feedback, which was recorded and the key takeaway from those meetings over a few months was that Aroland First Nation supported the Preferred Route as selected by Marten Falls First Nation.

Figure 4-7: Preferred Route



Based on the information outlined in **Table 4-5**, the overall Preferred Route for Segment 1 is Alternative 1 (**Figure 4-8**). The main reasons include:

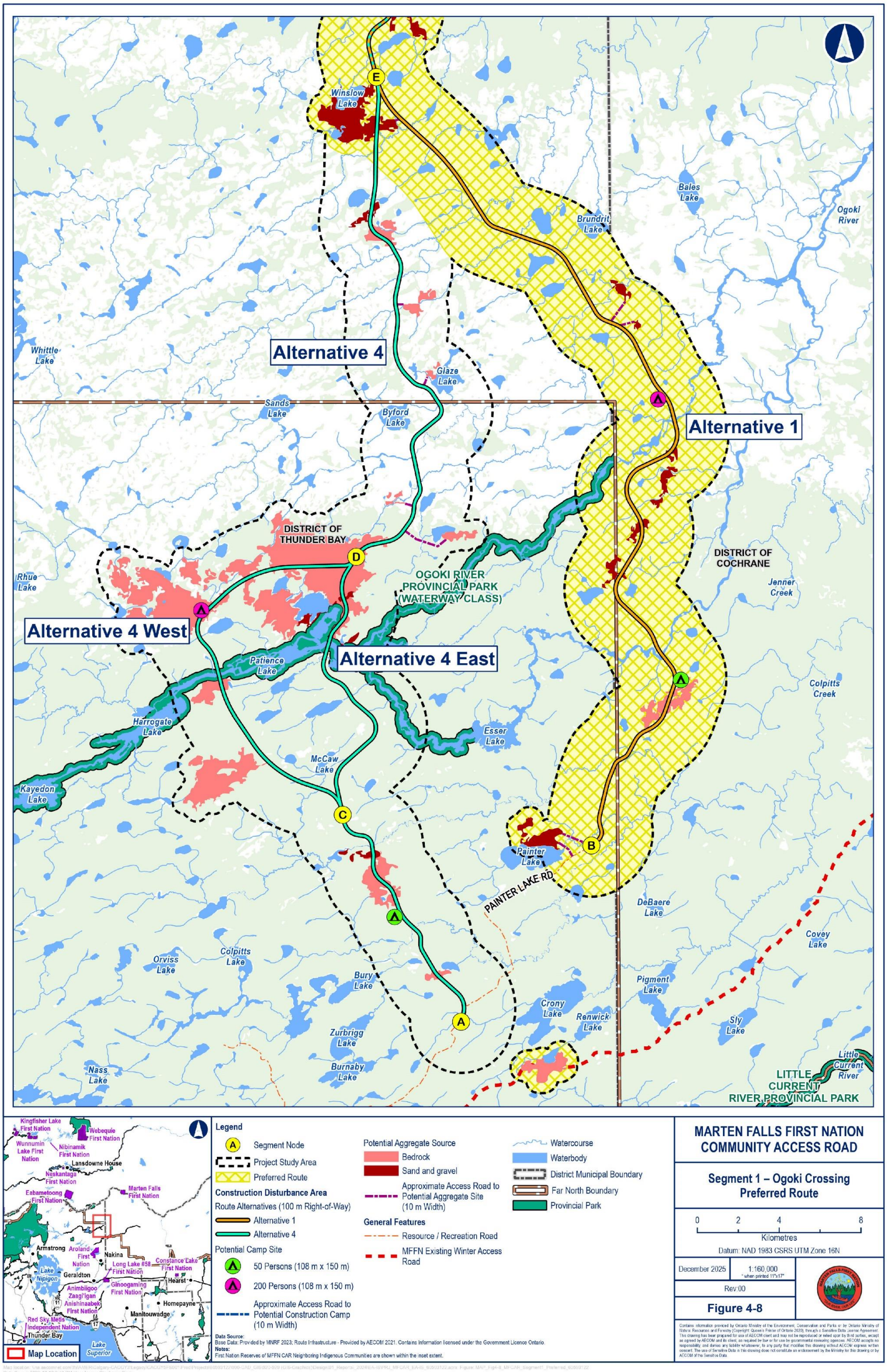
- Marten Falls First Nation and Aroland First Nation community members preferred Alternative 1;
- Provided Indigenous Knowledge did not raise any concerns with Alternative 1;
- Based on western scientific analysis:
  - Smaller footprint and shorter road length than the other options;
- Least disturbance to accessible habitats for Traditional Use Plants;
- Least loss of peatland area and least impacts to fewest peatland types;
- Least disturbance to significant landforms, soil, wildlife, wetlands, riparian ecosystems, upland ecosystems, birds, and caribou;
- Crosses over the least amount of area of coarse-grained and bedrock surficial materials;
- Least disturbed area of carbon sinks; and
- Least number of waterbody crossing locations.

Table 4-5: Segment 1 – Ogoki Crossing Results of Route Evaluation

Category	Alternative 1	Alternative 4 East	Alternative 4 West
Marten Falls First Nation and Aroland Community Feedback	●	▲	◆
Indigenous Knowledge	●	▲	◆
Water	●	◆	▲
Land	●	◆	▲
People	●	◆	▲
Engineering, Costs	▲	◆	●

Legend: Green circle = most preferred;
Yellow diamond = moderately preferred;
Red triangle = least preferred

Figure 4-8: Segment 1 – Ogoki Crossing Preferred Route



The main reasons why Alternative 1 is the least preferred alternative from an engineering point of view include:

- Fewer bedrock quarry opportunities – requires longer hauls, increases cost;
- Complex constructability – the majority of the route traverses poor substrates;
- High schedule implications:
- Road construction with poor substrates, terrain, and high cost to haul aggregates; and
- No means of access without significant upgrades to the Painter Lake Road section;
- High maintenance / operational costs due to poor ground terrain compared with other alternatives and gravel haul costs.

For the purposes of route selection, it was assumed that all upgrades to Anaconda Road and Painter Lake Road required to construct and operate Segment 1 will be completed in advance by others.

4.4.2 Segment 2 – Albany Crossing

The preliminary recommendation was presented for consideration to Marten Falls First Nation community members, and Chief and Council on October 23 and 24, 2023.

The preliminary recommendation identified Alternative 1 as the preferred alternative for Segment 2. Marten Falls First Nation community members expressed concerns with this alternative paralleling the Albany River near Teabeau Lake. The Albany River and the surrounding area are very important to Marten Falls First Nation. Having a road and associated traffic for kilometres along it would forever change an area too valuable to sacrifice, impacting valued components that Marten Falls First Nation wants to safeguard. They communicated their preference for Alternative 4. The engineers and consultants explained that Alternative 4 would require large quantities of aggregate as it is on a lower lying area and needed to be raised. The preliminary recommendation had identified aggregate areas near Teabeau Lake at the same location at which Alternative 1 paralleled the Albany River and another source further north. Marten Falls First Nation reiterated their concern with having any disturbance near Teabeau Lake. The engineers completed more detailed calculations and established that there would be enough aggregate from a site further north, and away from Teabeau Lake. This change reduced the overall footprint which in turn also changed the preference from the water and land technical discipline specialists in favour of Alternative 4. As such, the recommendation

was revised and the overall Preferred Route for Segment 2 coincides with Marten Falls First Nation's preference for Alternative 4.

The updated results of the overall Preferred Route for Segment 2 are presented in **Table 4-6** and **Figure 4-9**.

Table 4-6: Segment 2 – Albany Crossing Results of Route Evaluation

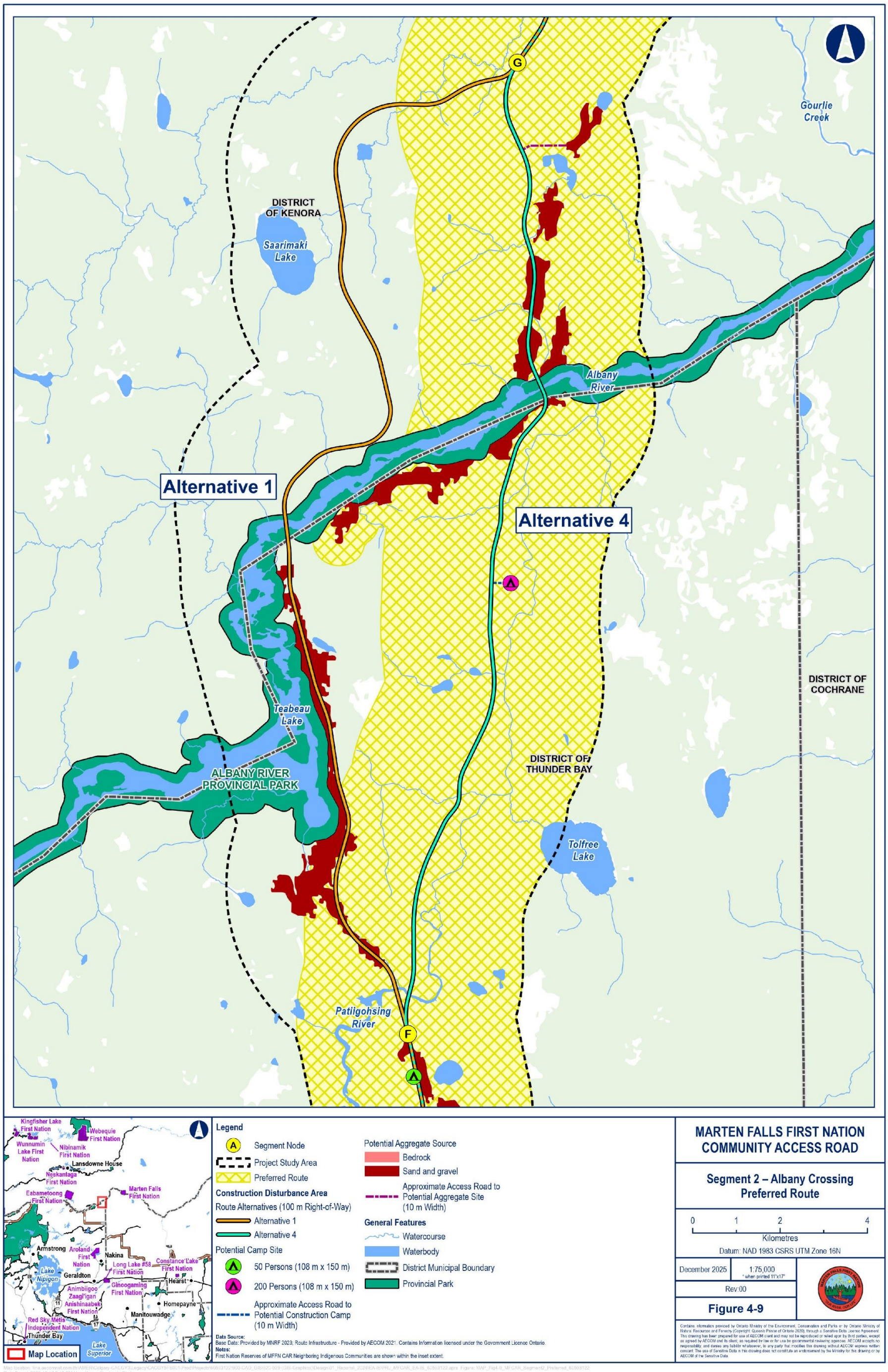
Category	Alternative 1	Alternative 4
Marten Falls First Nation Community Feedback	▲	●
Indigenous Knowledge	▲	●
Water	◆	◆
Land	◆	●
People	◆	●
Engineering, Costs	●	◆

Legend: Green circle = most preferred;
Yellow diamond = moderately preferred;
Red triangle = least preferred

The overall Preferred Route for Segment 2 is Alternative 4. The main reasons included:

- Identified by Marten Falls First Nation community members as the preferred alternative;
- Received Indigenous Knowledge did not raise any concerns with Alternative 4;
- Based on western scientific analysis:
  - Less loss of peatland area and impacts to fewer peatland types;
  - Less impacts to winter use habitat and no impacts to nursery area habitat for ungulates;
  - Less impacts on wildlife;
  - Smaller direct loss of highly suitable and highly accessible habitat for Traditional Use Plants;
  - Smaller impact to suitable Species at Risk / Species of Conservation Concern;
  - Less visual impact; and
  - Narrower water crossing at the Albany River (94 metres versus 194 metres).

Figure 4-9: Segment 2 – Albany Crossing Preferred Route



4.4.3 Segment 3 – North of the Albany

The main use of the Community Access Road will be for Marten Falls First Nation. However, it will open the possibility for other infrastructure projects and potential future mineral exploration. One such project is the Northern Road Link, which is proposed to connect from the Community Access Road.

The Community Access Road Terms of Reference were approved in October 2021 and included Alternatives 1 and 4. The Northern Road Link Proposed Terms of Reference (Northern Road Link, 2022) were submitted later, in April 2022, and their route alternatives considered allowing the Northern Road Link to connect to the Community Access Road regardless of Marten Falls First Nation's choice of a preferred alternative for Segment 3. Therefore, the selection of Segment 3 did not consider the Northern Road Link to avoid additional impacts.

Based on the information outlined in **Table 4-7** the overall Preferred Route for Segment 3 is Alternative 4 (**Figure 4-10**). The main reasons include:

- Identified by community members as the preferred alternative;
- Received Indigenous Knowledge did not raise any concerns with Alternative 4;
- Based on western scientific analysis:
  - Smaller footprint and shorter road length than the other option;
  - Smaller direct loss of highly accessible habitats for Traditional Use Plants;
  - Smaller direct loss of peatland area;
  - Disturbance of fewer significant landforms, surficial materials and soils;
  - Crosses over the least area of coarse-grained and bedrock surficial materials;
  - Least number of sensitive receptors;
  - Lower residual effects on wildlife, birds, moose, and caribou;
  - Least number of waterbody crossing locations; and
  - Smaller direct loss of wetland and riparian ecosystems, disturbance of fewer upland ecosite types and smaller direct loss of highly suitable habitat for Traditional use Plants.

The main reasons why Alternative 4 is the least preferred alternative from an engineering point of view include:

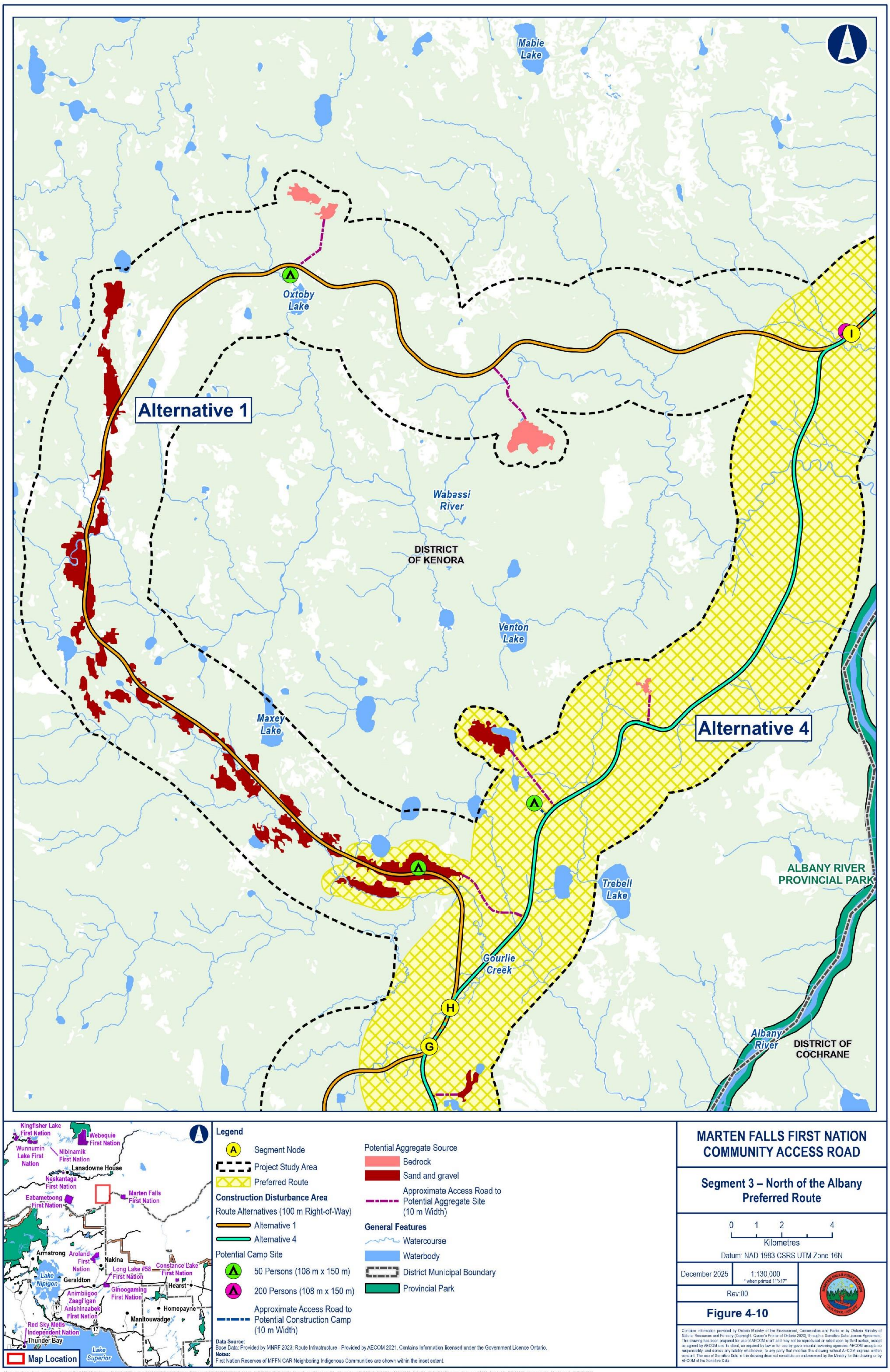
- Constructability of roadway and cost; and
- Access to aggregate.

Table 4-7: Segment 3 – North Albany Crossing Results of Route Evaluation

Category	Alternative 1	Alternative 4
Marten Falls First Nation Community Feedback	▲	●
Indigenous Knowledge	◆	◆
Water	▲	●
Land	▲	●
People	▲	●
Engineering, Costs	●	▲

Legend: Green circle = most preferred;
Yellow diamond = moderately preferred;
Red triangle = least preferred

Figure 4-10: Segment 3 – North of the Albany Preferred Route



4.4.4 Regulatory Requirements

The Community Access Road is required to meet provincial regulatory requirements for the selection of the Preferred Route. The list below outlines how these requirements were met.

- Undertaking consultation on route selection criteria;
- Determining / documenting applicable mitigation measures;
- Providing a description of net effects considering the quantity and sensitivity of features and the proposed mitigation. Effects were quantified where possible (for example length, number, and area);
- Providing a description of the Project and alternatives, including a rationale for each;
- Describing the environment that will be affected, or that might reasonably be expected to be affected, directly or indirectly;
- Documenting preference for alternatives based on each technical discipline / valued component;
- Determining the Preferred Route for each segment;
- Documenting the consultation undertaken on the selection of the Preferred Route;
- Complete net effects assessment on the Preferred Route considering each technical discipline / valued components and more detailed mitigation; and
- Comparing advantages / disadvantages to the do nothing alternative.

There are no federal requirements related to route selection.

4.5 Summary

The Preferred Route considered in this Environmental Assessment / Impact Statement (**Figure 4-7**) consists of the eastern alternatives. Refer to **Section 7** for the result of collaboration between Marten Falls First Nation, other Indigenous communities and the consultants. It considers Indigenous Knowledge; impacts to water, land and people; and the interconnectedness and interdependence of human-ecological systems. Although none of the alternatives chosen were the engineers' preference, the Project Team has worked with the engineers to make sure that the Preferred Route is still constructable and safe; and that it will remain operational for generations to come.

5. Roles of Regulators

5.1 Regulatory Framework

Before being able to build the Community Access Road, approvals need to be obtained for different project activities such as the construction of the Community Access Road and setting up aggregate sites to help with construction. There are federal and provincial requirements that need to be met before obtaining those approvals.

5.1.1 Provincial Environmental Assessment Requirements

The provincial *Environmental Assessment Act* (Government of Ontario, 1990a) considers potential environmental effects which could result from the construction and operation of a project. In April 2018, Marten Falls First Nation signed an agreement with the Ministry of the Environment, Conservation and Parks confirming the environmental process which needed to be undertaken before constructing the Community Access Road, including the preparation of an Individual Environmental Assessment, now called a Comprehensive Environmental Assessment. A Comprehensive Environmental Assessment is prepared for large-scale, complex projects with the potential to cause environmental effects.

The Community Access Road is aiming to co-ordinate notifications, where possible, for the environmental assessment to meet the requirements of other Class Environmental Assessments. Some project activities could be subject to various Class Environmental Assessment processes, including:

- Class Environmental Assessment for Provincial Parks and Conservation Reserves (Ministry of the Environment, Conservation and Parks, 2004), as the project requires the disposition of land(s) and permits to build new road(s) and water crossing(s) within provincial park(s), which are managed by the Ministry of the Environment, Conservation and Parks, Ontario Parks Operations;
- Class Environmental Assessment for Resource Stewardship and Facility Development (Ministry of Natural Resources and Forestry, 2024) projects regarding disposition of rights to Crown resources, which would be managed by the Ministry of Natural Resources; and
- Class Environmental Assessment for Provincial Transportation Facilities and Municipal Expressways (Ministry of Transportation, 2024a).

The decision regarding ownership of the Community Access Road has yet to be made. It is currently unknown who will own, maintain and operate the Community Access Road.

5.1.2 Federal Impact Assessment Requirements

All-season public roads that require 75 kilometres or more of new right-of-way, as per Schedule 1 (51) of the Physical Activities Regulations under the *Impact Assessment Act*, may be subject to the Act (Government of Canada, 2019b). After considering the detailed Project Description, the Agency determined that a federal impact assessment is required for the Community Access Road and an Impact Statement needs to be submitted to the Agency for review and approval. The Agency prepared and released the Marten Falls Community Access Road Project: Tailored Impact Statement Guidelines in February 2020 (Impact Assessment Agency of Canada, 2020a) to outline the information and studies necessary to conduct the impact assessment.

The federal process has legislated time limits. This means that the process should take a certain amount of time. The Community Access Road's Impact Statement was initially expected to be provided by February 24, 2023. However, Marten Falls First Nation faced challenges to meet this timeline due to the COVID-19 pandemic, summer 2021 forest fires, winter 2021 / 2022 heavy snow conditions, and unforeseen regulatory requirements. This resulted in delays and therefore in November 2022, Marten Falls First Nation requested a 3.5-year extension. The Agency granted the extension in January 2023, which provided more time to complete the Impact Statement Phase (in other words, to make sure that all required information and studies are submitted to the Agency). The federal Impact Assessment Process consists of five phases: Planning, Impact Statement, Impact Assessment, Decision-Making and Post Decision. The Community Access Road is in the Impact Statement phase.

The time limit to conclude the Impact Statement Phase was varied to reflect the time period between the release of the Supreme Court of Canada's decision on the constitutionality of the *Impact Assessment Act* and the day the amendments to the Act came into force. Communication was received from the Agency on October 8, 2024, indicating that a decision on the Community Access Road's Impact Statement will be provided by April 1, 2027.

5.1.2.1 Supreme Court of Canada Decision

On October 13, 2023, the Supreme Court of Canada released its ruling finding Canada's *Impact Assessment Act* unconstitutional in part. On June 20, 2024, the *Budget Implementation Act, 2024, No. 1* received Royal Assent and brought into force amendments to the *Impact Assessment Act* (Government of Canada, 2019b). As per the Supreme Court decision, under the amended *Impact Assessment Act*, federal impact assessments for designated projects are to focus on prevention and mitigation of

adverse effects within areas of federal jurisdiction, including effects to fish and fish habitat, aquatic species listed under the federal *Species at Risk Act* (Government of Canada, 2002), migratory birds, effects to federal lands, and Indigenous peoples.

Marten Falls First Nation met with the Agency on July 31, 2024. During the meeting, the Agency offered to vary the time limit of the Impact Statement Phase by 251 days to reflect the time period between the release of the Supreme Court of Canada's decision on the constitutionality of the *Impact Assessment Act* and the day the amendments to the Act came into force.

The Agency sent a letter to Marten Falls First Nation on June 11, 2025, outlining the next steps in the Community Access Road Impact Statement Phase due to amendments made to the *Impact Assessment Act* (Government of Canada, 2019b). As stated in the letter, the Agency will focus its technical review of the Community Access Road Impact Statement on key issues under federal jurisdiction that are relevant for decision making, specifically federal effects and the positive benefits of the Community Access Road. The Agency will also concentrate on leveraging federal mechanisms outside the *Impact Assessment Act*, as well as provincial legislative frameworks and instruments, to address the key issues. Key issues the Agency will focus on include fish and fish habitat, migratory birds, potential impacts to Indigenous peoples, and public interest factors.

The Environmental Assessment / Impact Statement has been prepared to meet, as much as possible, the requirements of the Tailored Impact Statement Guidelines issued on February 24, 2020, under the *Impact Assessment Act* (Government of Canada, 2019b). Considering that impact statements under the 2024 amended *Impact Assessment Act* are to focus on issues of federal jurisdiction, some of the assessment work may not be predominantly featured in the final decision; however, the body of work is expected to inform the outcome.

5.1.3 Canada-Ontario Agreement on Assessment Co-operation

There are federal and provincial requirements that the Community Access Road must meet before construction can begin. Federal and provincial governments are cooperating on the assessment of the Community Access Road, in accordance with the Cooperation Plan (Impact Assessment Agency of Canada, 2020b). The Cooperation Plan allows Marten Falls First Nation to prepare one single Environmental Assessment / Impact Statement submission to satisfy both the federal and provincial processes (Government of Canada). Marten Falls First Nation worked with both levels of

government to understand what a “single, cooperative assessment” includes. Here are some key points:

- The Agency and the Ministry of the Environment, Conservation and Parks are to co-ordinate activities, where possible, including harmonizing timelines, streamlining processes, and reducing regulatory burden. They will also work to provide Marten Falls First Nation with consistent advice, and to share information and expertise during review. Each jurisdiction retains its own decision, which means that the Province and the Agency will come to their own decision about the Environmental Assessment / Impact Statement and its recommendations;
- The Province and the Agency have agreed with a combined Environmental Assessment / Impact Statement for the Community Access Road;
- The Agency will, within regulatory timeline limitations, align and co-ordinate with Ministry of the Environment, Conservation and Parks public comment periods and associated timelines for the Community Access Road;
- The Agency will lead Crown consultation on behalf of the Government of Canada, while Ontario (Ministry of the Environment, Conservation and Parks and Ministry of Mines) will be responsible for provincial Crown consultation. They will co-ordinate, where possible, joint consultation and engagement meetings with Indigenous communities, subject to the communities’ agreement on this approach; and
- The Agency and Ministry of the Environment, Conservation and Parks will consult with each other regarding proposed conditions related to decisions, to facilitate consistency and improve regulatory efficiencies.

5.1.4 Preparation of the Environmental Assessment / Impact Statement

To prepare one single submission that meets both requirements of the provincial environmental assessment and the federal impact assessment, Marten Falls First Nation needed to understand what these requirements are.

The first step under the provincial environmental assessment process is the submission and approval of a Terms of Reference. A Terms of Reference is a document prepared by the Proponent of the undertaking and submitted to the Ministry of the Environment, Conservation and Parks for approval. It sets out the framework for the planning and decision-making process to be followed by the Proponent during the preparation of an environmental assessment. The Terms of Reference was approved, with amendments, by the Ministry of the Environment, Conservation and Parks on October 8, 2021.

Under the federal impact assessment process, the planning phase of the process ended on February 24, 2020, and produced the final Tailored Impact Statement Guidelines as

well as various plans (for example Cooperation Plan, Indigenous Engagement and Partnership Plan, Permitting Plan, and Public Participation Plan). These documents serve as a roadmap for the activities and participatory opportunities of the federal impact assessment process. The final Tailored Impact Statement Guidelines were posted on the Registry on February 24, 2024.

Both the Terms of Reference and Tailored Impact Statement Guidelines are lengthy documents and do not follow the same order or include the same requirements. To help with the review of the Environmental Assessment / Impact Statement and comparing it against the regulators' requirements, concordance tables have been prepared which list the federal and provincial requirements and indicate where the information can be found in this submission. The concordance tables are included in **Appendix C**.

5.1.5 Review of the Environmental Assessment / Impact Statement

A Draft Environmental Assessment / Impact Statement was released in 2025 to allow Indigenous communities, the public, and regulators an opportunity to provide their feedback. The Final Environmental Assessment / Impact Statement was prepared to meet the federal Tailored Impact Statement Guidelines and the provincial Terms of Reference. Feedback on the Draft Environmental Assessment / Impact Statement has been reviewed and incorporated as appropriate to prepare the Final Environmental Assessment / Impact Statement. The feedback received and the associated responses can be found in **Appendix C**.

Table 5-1 presents an outline of the approximate timelines for the review process after the Environment Assessment / Impact Statement is submitted.

Opportunities to provide comments on the Environmental Assessment / Impact Statement will be provided throughout the review process (Draft Environmental Assessment / Impact Statement circulation, Final Environmental Assessment / Impact Statement circulation, Ministry Review period, etc.). The Province and the Agency will consider these comments and may ask questions of clarification and request additional information from Marten Falls First Nation. It is also possible that other Indigenous communities may provide information at this stage (for example Indigenous Knowledge) that may need to be considered in the assessment. The regulators will evaluate all the information and make a decision on whether the Environmental Assessment / Impact Statement meets their requirements. For projects undergoing federal / provincial assessments, including the Community Access Road, the final decision on the assessment is required before the project can secure any relevant permits, licence, authorizations and approvals to begin construction **(Appendix AA)**.

Table 5-1: Submission Timelines

Task Name	Submission Timeline	End of Review Period / Decision
• Draft Environmental Assessment / Impact Statement (Interested Persons only draft Record of Consultation and Progress Report 3) – early release to Indigenous communities	February 18, 2025	120 days
• Draft Environmental Assessment / Impact Statement (Interested Persons only draft Record of Consultation and Progress Report 3) – submission to regulators	April 22, 2025	60 days
• Federal Impact Assessment Phase begins. During the Impact Assessment Phase, the Agency will: – conduct its analysis of the Assessment Process for the Community Access Road; – develop an Impact Assessment Report and any potential conditions; and – conduct a public comment period on the Impact Assessment Report and the potential conditions	April 2025	300 days
• Draft Environmental Assessment / Impact Statement (Interested Persons only draft Record of Consultation) – public review period	April 22,2025	60 days
• Milestone 4 Progress Report (Draft Record of Consultation and Engagement for Indigenous Communities)	First quarter 2025	29 days
• Receipt of comments and incorporation into the Final Environmental Assessment / Impact Statement	June 23, 2025	October 17, 2025
• Final Environmental Assessment / Impact Statement and final Record of Consultation	February 20, 2026	-
• Provincial comment period of the Environmental Assessment	7 weeks	-
• Ministry of the Environment, Conservation and Parks prepares the provincial comment period on Ministry Review	5 weeks	-
• Provincial comment period of the Environment Assessment	5 weeks	-
• Minister (Provincial) decision-making phase	13 weeks	-
• Federal decision-making phase	30 days	-

5.1.6 Amendment Procedure

This section provides the procedure to be followed in the event changes are made to what is outlined in this Environmental Assessment / Impact Statement. This is a regulatory requirement and certain concepts need to be provided to meet the provincial requirement as detailed in the *Environmental Assessment Act*. Therefore, this section may not easily be conveyed in plain language.

5.1.6.1 Minor Changes and Significant Changes

5.1.6.1.1 Procedure for Changes to Project

This procedure will be followed when the Proponent wishes to make a change to the Community Access Road (the Project) as detailed in the Environmental Assessment, following *Environmental Assessment Act* approval, should approval be given.

5.1.6.1.2 Minor Changes and Significant Changes

A “change to the Project” means a change to the Project as it is described in the Final Environmental Assessment / Impact Statement or any Final Environmental Assessment / Impact Statement Addenda, a change to any monitoring programs as set out in the Final Environmental Assessment / Impact Statement, a change to any mitigation measures set out in the Final Environmental Assessment / Impact Statement or any Final Environmental Assessment / Impact Statement Addenda, and a change to any commitments documented in the Final Environmental Assessment / Impact Statement.

A “minor change” means any change to the Project that does not result in new or increased net negative environmental effects beyond those assessed in the Environmental Assessment / Impact Statement.

A “significant change” means a change to the Project that is not a minor change.

The Proponent will assess the potential net negative environmental impacts of the proposed change. Based on that assessment, the Proponent will determine whether a proposed change to the Project is a minor change or a significant change. The Proponent will document the assessment and determination, which will include a description of the change, the rationale for the change, and a description of any new or increased net negative environmental effects.

The Proponent will provide the assessment to the Ministry of the Environment, Conservation and Parks Director (Director), Environmental Assessment Branch.

5.1.6.1.3 Procedure for Minor Changes

For a minor change to the Project, the Proponent will provide notice of the minor change to:

1. Every Indigenous community that was consulted during the Environmental Assessment process;
2. The clerk of every municipality that was consulted during the EA process; and
3. Any provincial ministry, federal department, or other person who, in the opinion of the Proponent, may be interested in the minor change.

The Proponent will then prepare a document that includes a description of the change and a summary of the assessment described in **Section 5.1.6.1.2**. The Proponent will publish a copy of the document on the Project website and thereafter may proceed with the minor change.

5.1.6.1.4 Procedure for Significant Changes

For a significant change to the project, the Proponent will prepare a Draft Environmental Assessment / Impact Statement Addendum that includes the following:

- A description of the proposed change(s);
- Reason for the proposed change;
- A description of the assessment carried out under **Section 5.1.6.1.2**;
- Potential environmental impacts associated with the change(s), as well as any related changes to monitoring, mitigation measures, or commitments for future construction and operation responding to the potential environmental impacts;
- Any known external approvals required.

5.1.6.1.5 Consultation on Draft Environmental Assessment / Impact Statement Addendum

The Proponent will prepare a Notice of Draft Environmental Assessment / Impact Statement Addendum. The Notice of Draft Environmental Assessment / Impact Statement Addendum will include:

- Name of the Project;
- A brief description of the proposed significant change;
- Geographical location of the Project study area;

- Name of the Proponent;
- Invitation to provide comments on the results of the Draft Environmental Assessment / Impact Statement Addendum (noting whether changes are of an urgent nature, as below);
- Start and end dates of the comment period;
- Contact information for individuals who can provide further information;
- How the Draft Environmental Assessment / Impact Statement Addendum can be accessed; and
- Information on where any additional materials can be accessed (e.g., website, physical location).

The Proponent will distribute the Notice of Draft Environmental Assessment / Impact Statement Addendum by:

- Providing a copy of the notice to:
  - Every Indigenous community that was consulted during the Environmental Assessment process for the Project;
  - The clerk of every municipality that was consulted during the Environmental Assessment process for the Project; and
  - Any provincial ministry or federal department or other person who, in the opinion of the Proponent, may be interested in the significant change; and
- Publishing a copy of the notice on the Project website.

The Notice of Draft Environmental Assessment / Impact Statement Addendum will provide for a minimum 30-day comment period, or other time period as directed by the Director of Environmental Assessment Branch.

The Proponent will consider and address, as appropriate, any comments or concerns received from interested parties. Any changes made to the Draft Environmental Assessment / Impact Statement Addendum as a result of concerns raised in respect of the change will be reflected in the Final Environmental Assessment / Impact Statement Addendum.

The Proponent will consolidate all comments received during the comment period, along with the Proponent's responses, into an Environmental Assessment / Impact Statement Addendum Record of Consultation. This document will also include a summary of notification and consultation activities, and records of meetings and other communications between the Proponent and commenters.

The Proponent will provide the Final Environmental Assessment / Impact Statement Addendum and Environmental Assessment / Impact Statement Addendum Record of Consultation to the Director of the Environmental Assessment Branch. The Final Environmental Assessment / Impact Statement Addendum and Environmental Assessment / Impact Statement Addendum Record of Consultation will also be posted to the Project website and may be made available in public location(s) if directed by the Director of the Environmental Assessment Branch.

5.1.7 Potential Permits and Approvals

Another regulatory requirement is to include a list of anticipated permits and approvals that will be required for the Community Access Road following completion of the Environmental Assessment process, as well as a list of commitments. To facilitate reference to this information, it has all been included in Appendix AA.

5.2 Qualifications of Individuals

One of the requirements of the Impact Statement is to list the main technical discipline specialists who supported the preparation of the submission. Each supporting technical document includes the names and qualifications of the authors and technical reviewers involved in the preparation of the supporting technical document. The names and qualifications of the individuals who prepared the Final Environmental Assessment / Impact Statement is included in **Appendix D**.

6. Our Approach

This section provides the methodology used to prepare the Environmental Assessment / Impact Statement for the Community Access Road. Certain information and technical concepts need to be provided to meet the federal and provincial requirements and may not easily be conveyed in plain language.

In 2021, Marten Falls First Nation submitted an Effects Assessment Methodology to the Province and the Agency to comply with the requirements of the Terms of Reference and the Tailored Impact Statement Guidelines (Impact Assessment Agency of Canada, 2020a). This document outlined Marten Falls First Nation's approach for completing the Environmental Assessment / Impact Statement. Both the Province and the Agency issued comments and questions, to which Marten Falls First Nation responded and updated the Effects Assessment Methodology accordingly.

This section aims to balance providing a plain language, non-technical explanation of the approach to complete the Environmental Assessment / Impact Statement with the regulatory requirements under the provincial *Environmental Assessment Act* (Government of Ontario, 1990a) and the federal *Impact Assessment Act* (Government of Canada, 2019b). Most of **Section 6** includes a simple overview of the methodology with some sections including more detailed and technical information to comply with the requirements.

Supplemental technical documents have been prepared for each valued component and are provided separately in the appendices. These documents describe how each technical discipline applied the methodology outlined here.

The federal and provincial process use different terminology. The Environmental Assessment / Impact Statement has been prepared typically using the federal terminology, except for effects assessment, which is used interchangeably. **Table 6-1** includes a list of the federal and provincial terminology.

Table 6-1: Glossary of Federal and Provincial Assessment Terminology

Federal Terminology	Provincial Terminology
Valued component	Criteria
Mitigation measure	Impact management measure
Residual effects	Net effects
Impact assessment	Effects assessment

6.1 Indigenous Knowledge

Indigenous Knowledge refers to Indigenous systems of knowledge as well as cultural practices related to the production of knowledge based on traditional belief systems, relationships to the environment, and community practices. It is the accumulated and living knowledge built upon the historic experiences of peoples living on the land and adapting to social, economic, environmental, spiritual, and political change (Chiefs of Ontario, 2025). It includes knowledge about the natural environment (for example caribou seasonal use and calving areas), the relationships between environmental changes and species or ecosystems, and how potential effects to the environment can be avoided or reduced.

Indigenous land and resource use refers to specific areas and resources used for traditional purposes when Indigenous peoples learn and practice their Indigenous Knowledge [Garvin and Northern Forestry Centre (Canada), 2001]. This includes the areas and sites used for hunting, trapping, fishing, and gathering, and the resources harvested, as well as cultural sites, features, and practices—sometimes referred to as Traditional Land Use.

6.1.1 Indigenous Knowledge Program

In 2019, the Project Team launched a program to collect Indigenous Knowledge. The Indigenous Knowledge Program is a critical component of the information base on which the assessments rely. The information generated through the Indigenous Knowledge Program has been woven with scientific approaches, and both knowledge systems have been given equal consideration in forming the foundation for existing conditions, predicting potential project effects, and determining appropriate mitigation and monitoring methods.

The Indigenous Knowledge Program consists of two concurrent phases:

- Collecting existing Indigenous Knowledge and information on Indigenous land and resource use to inform the early stages of the assessments; and
- Conducting project-specific Indigenous Knowledge and land and resource use studies.

The protection and confidentiality of Indigenous Knowledge and information on Indigenous land and resource use is of the utmost importance to the Project Team. To honour and respect this important information, Indigenous Knowledge Sharing Agreements were established with interested communities before the use of community information. The Sharing Agreement outlines how confidential and sensitive information will be woven into the Project's effects assessment and design processes.

All Indigenous communities and groups identified by the Ministry of the Environment, Conservation and Parks and the Agency through the Indigenous Engagement and Partnership Plan had the opportunity to participate in the Indigenous Knowledge Program. The Indigenous Knowledge Program provided interested Indigenous communities with an opportunity to share existing Indigenous Knowledge, information on Indigenous land and resource use, cultural values that may be relevant to the Community Access Road, and / or complete project-specific studies to collect and share Indigenous Knowledge, information on Indigenous land and resource use, and cultural values. The Indigenous Knowledge Program included opportunities for Indigenous communities and groups to meet with Marten Falls First Nation to discuss the program, ask questions, and share concerns and interests. In support of this, Marten Falls First Nation created an internal Indigenous Knowledge program guide that provides:

- An overview of the program and information on how Indigenous Knowledge, Indigenous land and resource use, and cultural values and practices can be collected and / or shared;
- Information on how Indigenous Knowledge, Indigenous land and resource use, and cultural values and practices may be used in the planning and design processes; and
- A suite of guidance materials developed based on the information requirements of both the federal and provincial assessment processes, including; question guides to support the collection of information on historical and current community context, Indigenous Knowledge relevant to the various technical disciplines, information on Indigenous land and resource use, cultural values and practices with associated spatial data, and perspectives on potential project-related effects and associated mitigation and / or enhancement measures.

The guidance document supported participating Indigenous communities in providing project-specific information in a manner that facilitates meaningful incorporation into the Environmental Assessment / Impact Statement.

Marten Falls First Nation strove to respectfully collaborate with Indigenous communities on how Indigenous Knowledge, information on Indigenous land and resource use, and cultural values were considered in reporting and how potential effects to Aboriginal and / or Treaty Rights and Interests were assessed. Measures to support this included, but were not limited to:

- Engaging Indigenous communities to solicit information on Indigenous Knowledge, Indigenous land and resource use, and cultural values;
- Informing existing conditions;

- Providing Marten Falls First Nation community members with sections of the Environmental Assessment / Impact Statement for review to Illustrate how Indigenous Knowledge and information on Indigenous land and resource use, and cultural values have been integrated, and to confirm that it has been presented appropriately, and
- Completing collaborative working sessions with Indigenous communities on Aboriginal and / or Treaty Rights and Interests.

Further information on how potential effects on Indigenous rights were assessed is provided in the Aboriginal and Treaty Rights and Interests Study Plan (AECOM, 2021).

Information provided by Indigenous Knowledge Holders, recognized as such by their Indigenous community, was obtained through literature review and shared directly by Indigenous communities. This was done either through face-to-face meetings or the receipt of Indigenous Knowledge reports.

Information on the status of neighbouring Indigenous communities' participation in the funding offer for the Indigenous Knowledge Program is included in **Table 11-3**. Each Technical Support Document includes a section on information shared by Indigenous peoples, which informed each report (Section 3 of the Technical Support Documents).

6.1.1.1 Inclusion in Reporting

The inclusion of Indigenous Knowledge was considered for each valued component. The extent of its consideration varied depending on the valued component itself, the potential for the Community Access Road to affect that valued component, and whether Indigenous Knowledge for that valued component was received. How Marten Falls First Nation integrated Indigenous Knowledge also depended on what was agreed upon in the Indigenous Knowledge Sharing Agreements. The Technical Support Documents, provided in the appendices and summarized in **Sections 8**, **9,** and **10**, describe how Indigenous Knowledge was considered and incorporated into each discipline.

6.1.2 Consultation and Engagement Program

All Indigenous communities identified by the Province and the Agency had the opportunity to participate in this program. Refer to **Section 11** for more information about how Indigenous communities were identified for the consultation and engagement program. To date, Marten Falls First Nation has organized Public Information Centres, webinars, Aboriginal and / or Treaty Rights and Interests forums, a forum to discuss the approach to reviewing the Draft Environmental Assessment / Impact Statement, and other consultation and engagement activities, as well as posted videos on the

Community Access Road website. The communities were provided with information on the Community Access Road and invited to participate at various stages. Marten Falls First Nation also attended in-community meetings when invited by the communities. In addition to this, the first hour of Public Information Centres was reserved for Indigenous community members. Field monitors from Marten Falls First Nation and Aroland First Nation also participated in the great majority of field surveys.

6.2 Gender-Based Analysis Plus

Gender-Based Analysis Plus is a methodology designed to identify and analyze how diverse groups of people including men, women, and gender-diverse people, youth, and Elders may experience policies, programs, and initiatives differently. It aims to make sure inclusive outcomes by integrating a comprehensive, equity-focused approach in all stages of planning, execution, and evaluation. The methodology integrates data collection, analysis, and evaluation to provide an inclusive approach that addresses the specific needs and challenges of each group.

6.2.1 Data Collection

Gender-Based Analysis Plus data collection for the Community Access Road included demographics, human health, engagement opportunities, and secondary research. This approach aimed to capture diverse perspectives, address data gaps, and establish a comprehensive socio-economic and health existing conditions and effects assessment.

- **Demographics:** Data was collected on gender, age, location (for example on-reserve and off-reserve population), and educational attainment levels. These data was collected primarily through Statistics Canada information and through surveys to fill data gaps (Statistics Canada, 2023a);
- **Human health:** Data was collected on the safety and security of women and girls, including gender-based violence, human trafficking, and access to healthcare;
- **Engagement opportunities:** Attention was given to voices that are traditionally underrepresented in decision-making. Sessions were held with youth during school hours, and with women and Elders in Marten Falls and Thunder Bay. Refer to **Section 11** for more information; and
- **Secondary research:** Existing reports, literature, and statistical data relevant to Gender-Based Analysis Plus was reviewed to establish context and socio-community, economic, and human health existing conditions.

6.2.2 Analytical Framework

The Gender-Based Analysis Plus was guided by an intersectional approach, examining how various identities (for example gender, age, and socio-economic status) intersect to create unique experiences and challenges for individuals, and how these relate to the Community Access Road. Data was assessed to understand the specific needs, barriers, and potential impacts of the Community Access Road on diverse groups. For this assessment, the focus was on identifying Gender-Based Analysis Plus information, mitigating unintended negative effects that may result from the Community Access Road, and maximizing potential community benefits.

6.2.3 Inclusion in Reporting

The inclusion of Gender-Based Analysis Plus was considered for each valued component. The extent of its consideration varied depending on the valued component itself, the potential for the Community Access Road to affect that valued component, and the availability of Gender-Based Analysis Plus information. Where this information was available, it has been included in Existing Conditions, Residual Effects Assessment, Cumulative Effects Assessment, and Monitoring Programs and Future Commitments (Sections 5, 7, 8, and 9 respectively of the Technical Support Documents), as applicable.

6.2.4 Limitations and Assumptions

We recognize that there may be limited data available for Marten Falls First Nation. For example, some Statistics Canada Data for 2021 has been redacted to meet confidentiality requirements under the *Statistics Act* (for example, income of individuals in 2020), so data from 2016 may be used, if available (Statistics Canada, 2017; Government of Canada, 2017b).

Another limitation is the small sample sizes for subgroups. In-community surveys were completed and Gender-Based Analysis Plus information was requested, but due to low response rates, there are statistical limitations to the data, making it challenging to draw conclusions.

Small sample sizes also increase privacy concerns, as identifying individual responses become easier with a limited dataset. This may discourage individuals from reporting gender-diverse identities due to social stigma, which could impact the inclusivity of the data. The reliance on self-reported data in the survey may introduce bias, reluctance to disclose sensitive details, or variations in how individuals understand and interpret identity categories.

A comprehensive gender-based plus analysis requires data disaggregated by multiple identity factors (for example gender, age, and socio-economic status). While best efforts were made to collect these data, some levels of detail may be missing, which could limit the ability to fully capture intersectional experiences.

6.3 Valued Components

An effects assessment of the Community Access Road begins with identifying what is valuable from an environmental, economic, social, and health perspective, and could be impacted by the road, referred to as valued components. Both the Terms of Reference and Tailored Impact Statement Guidelines included a list of valued components (or assessment criteria) to be assessed. In and around Marten Falls, there are many valued components, which have been grouped into the following groups so that they could be studied further: water, land, and people. The specific technical disciplines identified for each group are as follows:

- **Water:** surface water, fish and fish habitat, groundwater and geochemistry, and peatlands;
- **Land:** vegetation; wildlife; birds; ungulates; and physiography, terrain, and soils; and
- **People:** Aboriginal and / or Treaty Rights and Interests, acoustic and vibration environment, cultural heritage, archaeology, atmospheric and greenhouse gas, community well-being (economic, human health and community safety, and social), land and resource use and visual environment.

At the beginning of the Project, valued components were provided by the Province and the Agency through discussions, formal documents such as the Tailored Impact Statement Guidelines, and through a determination of best practice for different disciplines. Throughout the development of the field programs, the valued component list was expanded to consider Indigenous Knowledge and conversations with members of Marten Falls First Nation and other local communities.

Each discipline has valued components to be assessed. For example, for fish and fish habitat, different species were identified that served as good species to determine the overall health of fish, these include namehn (Lake Sturgeon), okaas (Walleye), masamekos (Brook Trout), najwabe (Northern Pike) and ling (Burbot). A description of the valued components for each discipline can be found in **Section 8**.

6.4 Criteria and Indicators

Once the applicable valued components were confirmed, the next step was to find a way to measure potential effects to each valued component, specifically the changes caused by the Community Access Road. These are called indicators. They represent the resource, feature, or issue related to a valued component that, if changed, may demonstrate an effect on water, land, or people.

For example, in the case of the fish species listed above, the selected indicators included:

- Habitat quality and quantity;
- Distribution and connectivity of habitat and migration; and
- Survival and reproduction.

The Supporting Technical Documents include a description of how indicators were selected for each valued component.

6.5 Project Phases and Physical Boundaries

The next step in the methodology was to define the project phases and physical boundaries, so that we can understand how the activities associated with the Community Access Road and all the associated infrastructure (for example quarries) may interact with the physical environment. This is important because not all construction and operation activities are relevant to every valued component.

To manage these differing effects, we need to properly define what is referred to as the “temporal boundary,” which is the time period during which the project effects occur, and the “spatial boundary,” which is the physical location of those effects. The temporal boundaries are common to all the discipline groups; however, the spatial boundaries differ based on the discipline and the potential interactions.

6.5.1 Temporal Boundaries

The Community Access Road assessment considered the following temporal boundaries:

- **Construction:** construction starts with site preparation and continues until the Community Access Road is in operation. During construction, there will be a need for temporary infrastructure such as borrow areas, lay down and storage areas, temporary access roads, construction camps for workers, and temporary aggregate areas. The installation and removal of all temporary infrastructure is included in this phase. All temporary infrastructure will either be decommissioned

or closed, depending on the infrastructure type. For example, it is not possible to return a temporary aggregate site to its original condition before construction began. As a result, these locations will be closed in accordance with the requirements of the *Aggregate Resources Act* (Government of Ontario, 1990b). Other types of temporary infrastructure, such as construction camps, will be decommissioned, which includes removing all the components of the camp and establishing vegetation as outlined in the required Rehabilitation Plan to align with the Aggregate Resources of Ontario: Site Plan Standards (Ministry of Natural Resources and Forestry, 2020a) The construction phase of the Community Access Road is anticipated to last between 3 and 10 years;

- **Operations and Maintenance:** this phase will begin once all the construction activities described above are completed. It includes the use of the Community Access Road by vehicles and the maintenance activities required to keep the road safe and in good condition. This phase is considered permanent and is based on general knowledge of maintenance practices for similar highways, including when major repairs to road components, such as bridges, are typically needed; and
- **Decommissioning:** the Community Access Road is expected to operate as a permanent roadway. Therefore, there are no plans to decommission, and the work conducted by the disciplines did not consider the decommissioning requirements. If there is a future need to suspend use, decommission, or abandon the Community Access Road, a separate study would be required to assess the impacts and determine the path forward.

As we were defining the phases described above, our engineering and design team created a description of the anticipated construction, operations, and maintenance activities, which is shared in **Section 7**. Each discipline reviewed this description and used their experience and knowledge to identify potential interactions between the Community Access Road and the environment that require further discussion. Some of these interaction discussions are driven by requirements from various regulatory agencies. The Technical Support Documents, provided in the appendices and summarized in **Sections 8** and **9,** include information on the activities considered for each valued component.

6.5.2 Spatial Boundaries

The Community Access Road considered four spatial boundaries. These areas include locations where activities may take place and where interactions between these activities and the environment could occur.

The Project defined two general areas that are common to all disciplines:

- **Construction Disturbance Area:** this is described as the area of direct disturbance from the construction and operation of the Community Access Road. The following activities are expected to take place exclusively within this area: the Project footprint (the linear road corridor) roadway clearing and the construction of bridges, laydown areas, worker camps, pits and quarries, and associated temporary and permanent access roads. There is a 100-metre wide right-of-way associated with the Community Access Road for both Alternative 1 and Alternative 4, which will be cleared for construction; and
- **Project Study Area:** early in the scoping of the Community Access Road, this area was developed to help disciplines and the engineering and design team focus their studies and further refine the study area and Construction Disturbance Area. It represents generally the area of the Community Access Road. It consists of the corridor area 2.5 kilometres from the centreline of Alternative 1 and Alternative 4.

The disciplines defined two additional study areas, which vary by discipline, and in some cases, by valued component. For example, for wildlife, the Local Study Area for wolverine, caribou, and moose differ based on the known habitat and behaviours of each species.

- **Local Study Area:** this area represents the expected limit of direct effects from the Community Access Road. The local study areas for each discipline are outlined in **Sections 8** and **9**, with more information on their development provided in the appendices; and
- **Regional Study Area:** this area represents the expected limit where indirect and cumulative effects may occur. The regional study areas for each discipline are outlined in **Sections 8** and **9**, with more information on their development provided in the appendices.

6.6 Existing Conditions

Existing condition is a term used to describe the condition of water, land, and people as they are today. In some instances, this includes information on how past activities influenced the way the environment exists today. Information on existing conditions was gathered based on the Local Study Area and Regional Study Area identified for each valued component. Data collection methods included desktop reviews of existing information, field programs that collected baseline valued component specific data and

other information from the Project Study Area, and a review of Indigenous Knowledge provided by Marten Falls First Nation and other Indigenous communities with interests in the Project area. This information helped the disciplines form a picture of the current and past environment conditions within the Project Study Area, allowing them to determine what might change in the future. The existing condition in this Environmental Assessment / Impact Statement are described for both Alternative 1 and Alternative 4, and the ancillary infrastructure associated with each alternative, to meet the requirements of the Terms of Reference (as discussed in **Section 4**). This information was used to inform the selection of the Preferred Route. Detailed descriptions of existing conditions for each discipline are provided in the Technical Support Documents in the appendices, with a summary provided in **Section 8**.

6.7 Residual Effects Assessment

Following the collection of existing condition information on Alternative 1 and Alternative 4, an exercise was conducted to select the Preferred Route (**Section 4**). The Preferred Route includes all associated features, such as pits and quarries, temporary access roads, and worker camps associated with the construction of the Preferred Route. A residual effects assessment has been completed using the Preferred Route.

6.7.1 Identify Potential Effects

Once information on the existing condition was collected, each discipline used it alongside the description of anticipated construction, operations, and maintenance activities to determine the potential interactions between the Community Access Road and the environment. Based on these interactions, potential effects to the valued components were identified, and strategies to avoid or mitigate these effects were examined.

Mitigation strategies are designed to reduce the potential negative effects on the environment. For example, placing sources of fuel at least 30 metres from a waterbody is a mitigation measure that reduces the potential effect of accidental fuel spills on a waterbody.

Following the application of mitigation measures, the effects were reassessed to determine if any residual or left over effects remain. This process is referred to as the residual effects assessment.

The following provides a high-level description of the steps to complete a residual effects assessment:

- Identify potential effects: for example, during construction, potential effects to fish and surface water could include the release of sediment while constructing a water crossing;
- Identify mitigation measures to avoid or minimize identified effects and enhance benefits: for example, scheduling work to avoid wet and rainy periods can reduce the risk of erosion and sedimentation; and
- Predict residual effects following the implementation of mitigation measures. Residual effects are the remaining potential impacts that could occur after mitigation measures are put in place. In the example of erosion and sedimentation, no residual effects are expected if erosion and sediment control measures are regularly inspected for effectiveness throughout construction.

The residual effects assessment considered the potential interactions between the Preferred Route for the Community Access Road and the environment within the temporal and refined spatial boundaries described in **Section 6.5**. To determine the potential effects of the Community Access Road, a quantitative and qualitative analysis of the existing conditions and potential project interactions was reviewed. Based on this analysis, the disciplines drafted a description of the anticipated effects for each valued component.

In this phase of the assessment two types of effects are described:

- A **direct effect** occurs when there is a change due to a project activity. The potential direct effects resulting from the interactions between the Community Access Road and environment has been based upon input received through the Indigenous Knowledge Program, Consultation and Engagement Program, regulatory agency guidance, and professional judgement; and
- An **indirect effect** occurs when a change to one valued component resulting from a project activity causes a change to another valued component (in other words, changes in air quality could indirectly affect fish, vegetation, or wildlife).

Both effect types have been assessed for mitigation and residual effects.

6.7.2 Identifying Mitigation and Enhancement Measures

Following the identification of potential effects, disciplines explored technical and economical feasible mitigation measures that can be applied to avoid or minimize the

identified negative effects. Additionally, the technical disciplines examined potential enhancement measures to offset negative effects and increase positive effects. Mitigation and enhancement measures consist of industry-standard practices, federal and provincial standard specifications, regulator-mandated measures, best management practices, and recommendations from industry and environmental professionals based on expertise, scientific publications, experience, and judgement. Where available, Indigenous Knowledge and recommendations from Indigenous communities has also informed mitigation and enhancement measures.

6.7.3 Assessing Residual Effects

Residual effects are the effects remaining after the application of mitigation measures and include both direct and indirect effects. The assessment of residual effects is consistent with the sustainability principles outlined in Section 25 of the Tailored Impact Statement Guidelines. It identifies both positive and negative effects on existing conditions that are predicted to persist despite efforts to minimize or avoid changes through mitigation measures.

Where a potential effect was identified but implementation of mitigation measures is likely to avoid or sufficiently minimize the effect, the result is “no residual effect,” and the effect was not carried forward for characterization.

All predicted residual effects were carried forward for characterization using the characteristics outlined in **Table 6-2**. The characterization of the effects was based on industry-standard approaches, regulator requirements, and input from discipline teams.

Section 13 of the Tailored Impact Statement Guidelines provides additional direction on the effects assessment methods for some disciplines and valued components. Further information on the discipline-specific effects assessment methods or definitions for the *Impact Assessment Act* process are detailed within the corresponding Technical Support Documents provided in the appendices.

For magnitude, discipline-specific definitions apply and are provided within the Technical Support Documents. Ecological and socio-economic context may also be relevant when describing a residual effect. Where appropriate, information regarding residual effects on community wellbeing was disaggregated by gender, age, and other community relevant identity factors to identify disproportionate residual effects for diverse subgroups. Effects characteristics are described using both quantitative and qualitative information.

Section 13.1 of the Tailored Impact Statement Guidelines identifies additional effects characteristics for certain disciplines (for example wetlands, birds, terrestrial wildlife, and Species at Risk). These additional effects characteristics are described in the discipline-specific study plans.

Section 8.3 of the Terms of Reference indicates that for each net effect predicted, the direction, magnitude, geographic extent, duration, reversibility, frequency and likelihood will be described and are combined to reach a conclusion on significance of the net effects taking into consideration professional judgement.

The assessment of significance of residual effects of the Project was informed by the interaction between the residual effects characteristics, with magnitude, duration, and geographic extent being the most important factors, along with consideration of context. Consideration was also given to the concerns of Indigenous communities, interested agencies, groups, and individuals raised during engagement.

Using the overall residual effects characteristics, each of the potential residual effects was assigned a significance level as a means of ranking the potential effects. Significance was generally as follows (with consideration of context for each valued component):

- Significant: Residual effects were generally considered to be significant if the residual effects were classified as high in magnitude, a geographic extent greater than the Construction Disturbance Area, and a longer term in duration, or they represent a substantial management concern; and
- Not Significant: Residual effects were generally considered not significant if they demonstrated any other combination.

Taking into account the significance for each residual effect along with the context, an overall significance determination was completed for valued components.

Table 6-2: Residual Effects Characteristics

Effects Characteristic	Definition	Description
Context	• Social context. • Ecological context. • Timing of effect in relation to sensitive activities.	• Context relates to the existing setting, level of disturbance, and resilience to adverse effects. • Context can also relate to timing as it applies to assessing the worst-case scenario for all interactions.
Direction	• Direction of change from existing conditions.	• Positive: net gain or positive effect. • Neutral: no change to existing condition. • Negative: net loss or adverse effect.
Magnitude	• Magnitude is the expected change from existing conditions.	• Negligible, low, medium, and high.
Geographic Extent	• The spatial area where the effect is expected to occur.	• Construction Disturbance Area: effect is confined within the direct physical disturbance of the Community Access Road. • Local: effect extends into the Local Study Area. • Regional: effect extends into the Regional Study Area. • Beyond Regional: effect extends beyond the Regional Study Area.
Duration	• The period of time that the effect is expected to occur.	• Short-term: effect ends before the end of construction. • Medium-term: the effect occurs during construction and ends soon after operation begins, and / or occurs during operation and maintenance and ends soon after the activity causing the effect ends. • Long-term: the effect occurs during construction and persists into operation.
Frequency	• How often the effect is expected to occur.	• Infrequent: the effect is expected to occur rarely. • Frequent: the effect is expected to occur intermittently. • Continuous: the effect is expected to occur continuously.
Reversibility	• The ability to return to existing conditions.	• Reversible: the effect is not permanent. • Irreversible: the effect is permanent.
Likelihood	• Probability that the effect will occur.	• Unlikely: the effect is not likely to occur. • Possible: the effect may occur but is not likely. • Probable: the effect is likely to occur. • Certain: the effect will occur.
Uncertainty	• The potential for observed results to deviate from predictions made.	• Uncertainty could be related to a number of factors, such as project design and components, existing conditions, spatial and temporal scope, valued component response, effectiveness of mitigation measures, overall scope of factors considered, cumulative effects, and natural and human causes of accidental events.
Direct / Indirect	• Nature of the pathway through which the effect occurs.	• Direct effects are typically immediate and spatially aligned with the activity. Indirect effects may be delayed or spatially removed but are causally linked and predictable.

6.8 Cumulative Effects Assessment

The *Impact Assessment Act* (Government of Canada, 2019b) requires that each environmental assessment of a project consider any cumulative environmental effects that are likely to result from the project in combination with the environmental effects of other physical activities that have been or will be carried out in the region. A cumulative effects assessment builds on the results of the effects assessment and considers the incremental changes that are predicted to have a likely residual adverse effect on a valued component.

The Agency defines cumulative effects as "changes to the environment, health, social, and economic conditions, as a result of the Project's residual environmental, health, social, and economic effects combined with the existence of other past, present, and reasonably foreseeable physical activities, as well as within activities of the Project itself from multiple emissions and discharges (for example simultaneous operations) to understand synergistic or additive effects" (Impact Assessment Agency of Canada, 2020a).

Cumulative effects may result if:

- The implementation of the project results in direct residual adverse effects on valued components, even after applying technically and economically feasible mitigation measures; and
- The same valued components are also affected by other past, present, and reasonably foreseeable physical activities.

A cumulative effect on an environmental, health, social, or economic component can be significant even if the project's direct effects on that component are minor.

An easy way to describe cumulative effects assessment is as follows:

- Imagine you are gathering with family in the woods;
- When you and your cousins arrive, there is no one else and the area is quiet. You brought a speaker and decide to play some music;
- After a while, your parents, uncles, and aunts arrive. They want to listen to their own music, so they setup in a different spot and play what they like;
- Then the teenagers arrive and decide to listen to something different, so they go to another area and play their music; and
- Meanwhile, the younger kids learned some new songs and gather in another area to sing and play.

One could look at the music you are playing as your effects on the noise level in the woods. As more family members arrive, they are like other projects in the area, each contributing their own noise impacts. Your noise, plus everyone else's, represents the cumulative effect on the noise levels in those woods.

There are three key topics relating to cumulative effects that also need to be understood. These include:

- **Temporal Overlap:** this refers to your activity happening at the same time as another activity. For example, in the case of your family gathering in the woods, this means that to consider other sources of noise in your cumulative effects assessment, they must happen at the same time. If someone else visits the same woods 2 months later, there is no overlap in activity, meaning the noise you generate does not coincide with the noise from 2 months later, and therefore, there is no cumulative effect;
- **Spatial Overlap:** this refers to your activity happening in the same area as other activities. For example, in the case of your family gathering in the woods, the teenagers decide to go play music in the basement of one of their houses a few kilometres away. While they are generating noise at the same time as you, their music will not be heard in the woods due to the distance. Therefore, they overlap in time but not in space, and as such, there is no cumulative effect from the teenagers' music and yours; and
- **Reasonably Foreseeable Projects:** this concept refers to projects that can reasonably be anticipate and considered in a cumulative effects assessment. For example, you know your parents, uncles, aunts, and the younger kids will be coming. You also know that your neighbours organized a birthday party at the spot next the one you have chosen. It is therefore reasonably foreseeable that their activities will also contribute to noise in the woods, and you can consider their cumulative effect alongside yours.

An example of a project that is not reasonably foreseeable, in the context of the family gathering in the woods, would be unexpected construction to repair a bridge that collapsed the day before the event. Since you could not have known the bridge would collapse and that repair work would take place, the noise from the repair work would not be considered reasonably foreseeable.

Following our example, to understand the cumulative effects on noise levels in the woods, you would need to:

- Understand existing conditions: this refers to the noise levels that are already there before you arrive;
- Understand your impacts (in other words, how your music contributes to the overall noise levels);
- Consider mitigation measures (for example lowering your music volume or using headphones);
- Assess residual effects: these are the remaining effects after applying mitigation measures, such as the noise levels resulting from your music after lowering the volume or using headphones; and
- Add potential effects from other activities: once you know the residual effects of your music, you would add the potential effects of other reasonably foreseeable projects happening at the same time and in the same area.

Following the steps above would help identify the cumulative effects that may occur in the woods, considering both the noise you will make when you arrive and the noise from other sources being added.

The following sections are more technical and provide a detailed description of the Community Access Road cumulative effects assessment methodology. As mentioned before, certain information must be included in the Environmental Assessment / Impact Statement to comply with regulatory requirements.

6.8.1 Cumulative Effects Methodology

The cumulative effects assessment builds on the results of the effects assessment and considers the incremental changes that are likely to result in a residual adverse effect on a valued component. Valued components that are not expected to have a residual effect, or where the residual adverse effect is predicted to be of negligible magnitude or unlikely to occur, have not been carried forward into the cumulative effects assessment. Only the residual effects on valued components that have been identified are brought into the cumulative effects assessment.

The identification and assessment of cumulative effects were undertaken as follows:

- Identify and assess the residual effects of the Community Access Road;
- Define the spatial and temporal boundaries of the cumulative effects based on the residual effects predicted;
- Identify other past, present, and reasonably foreseeable activities with effects likely to overlap in terms of type (in other words, valued component), temporally, and spatially with the predicted residual effects of the Community Access Road; and
- Predict potential cumulative effects and identify additional mitigation if warranted.

6.8.2 Project Inclusions List

A Project Inclusions List was prepared as part of the cumulative effects assessment to determine physical activities that may have a spatial or temporal overlap with the Community Access Road. The Project Inclusions List includes details regarding infrastructure projects in northern Ontario, where information was publicly available from online sources. Project information from the following list of sources was reviewed:

- Canadian Impact Assessment Registry (Impact Assessment Agency of Canada, 2024);
- Environmental reviews for completed and ongoing environmental assessments (Canadian Nuclear Safety Commission, 2024);
- Major Project Inventory (Natural Resources Canada, 2023a);
- Major applications and projects before the regulator (Canadian Energy Regulator, 2024);
- Environmental Registry of Ontario (Government of Ontario, 2022);
- Environmental Assessments website (Ministry of the Environment, Conservation and Parks, 2022a);
- 2024 to 2027 Northern Highways Program (Ministry of Transportation Ontario, 2024b);
- Applications before the Board (Ontario Energy Board, 2022);
- Infrastructure Ontario Projects (Infrastructure Ontario, no date);
- Independent Electricity System Operator projects and funding programs website (Independent Electricity System Operator, 2024);
- Hydro One Major Projects (Hydro One Networks Inc., 2024);

- Ontario Power Generation Projects (Ontario Power Generation Inc., 2022);
- Class Environmental Assessment for Waterpower Projects notices website (Ontario Waterpower Association, 2024);
- Plans, Reports and Studies (Municipality of Greenstone, 2021a);
- Webequie Supply Road Project (Ministry of the Environment, Conservation and Parks, 2021a; Webequie Supply Road, 2020);
- The Northern Road Link Project (Ministry of the Environment, Conservation and Parks, 2023a; The Northern Road Link, 2024);
- Access Environment - Environmental Approvals and Registrations (Ministry of the Environment, Conservation and Parks, 2023b);
- Ontario Imagery Web Map Service (Ministry of Natural Resources and Forestry, 2020b);
- Regional assessment(s), where applicable; and
- Draft Marten Falls First Nation's community-based land use plans, where available.

In accordance with the Tailored Impact Statement Guidelines, the following projects have also been included on the Project Inclusions List and have been considered in the cumulative effects assessment:

- Historical and existing mineral developments, such as Orla Mining Ltd.'s Musselwhite Mine, De Beers' Victor Mine (closed), and Equinox Gold Corp.'s Greenstone Gold Mine;
- Other historical infrastructure projects, such as the Ogoki and Long Lac diversions;
- Webequie Supply Road Project;
- Rapid Lynx Broadband Project;
- Power transmission projects;
- Wataynikeneyap Powerline;
- Upgrades to the Anaconda and Painter Lake forestry roads;
- Northern Road Link Project;
- Railway transload facility;
- Activities within forestry management units;
  - Ogoki Forest Management Plans;

- Mining activities associated with the following deposits:
  - Eagle's Nest;
  - Black Thor;
  - Black Bird;
  - Big Daddy;
  - Black Label;
- Transportation of ore; and
- Mineral exploration activity / mining claims, such as Albany Graphite Corp.'s Albany Graphite Project

Publicly available information used to inform this list represents a snapshot in time ending in September 2025.

Using the information available on the above list of sources, temporal overlaps carried forward from the effects assessment were determined based on the following assumptions:

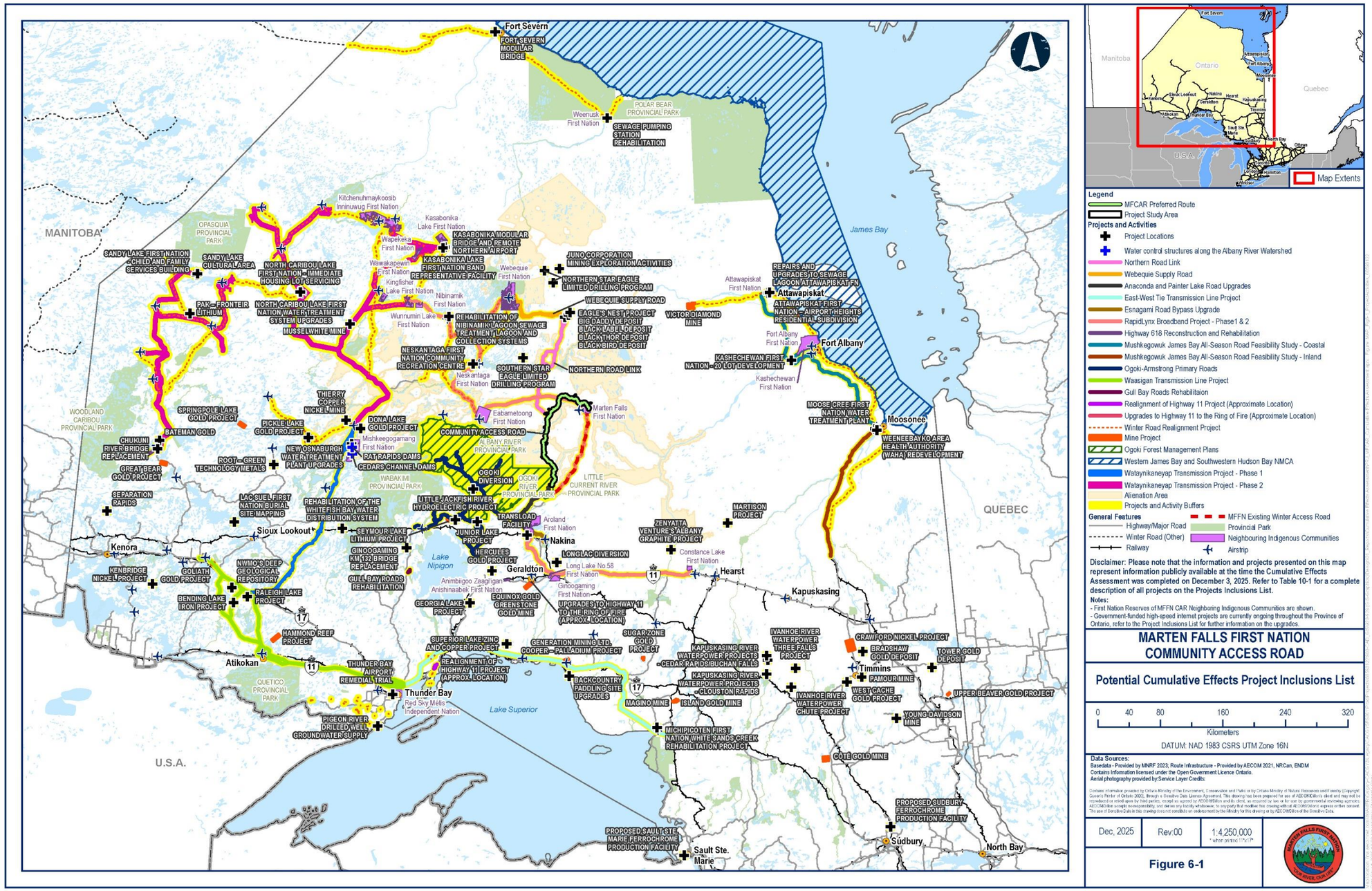
- Construction of the Community Access Road is anticipated to start within 2 to 5 years of Environmental Assessment / Impact Statement approval, depending on funding and permit acquisition; and
- Construction of the Community Access Road duration is anticipated to last between 3 and 10 years.

Spatial overlap and the distance between each project and the Community Access Road were determined for each valued component using location data, where available from the sources listed above. **Figure 6-1** shows the locations of each project included on the Project Inclusions List.

Using professional judgement and based on comments received through the Consultation and Engagement Program; past, present, and reasonably foreseeable activities identified as part of the Project Inclusions List have been reviewed. This review focused on activities where effects are likely to act cumulatively with the residual effects of the Community Access Road. Each discipline determined which activities should be considered to predict cumulative effects.

- Do the projects overlap in the type of effects?
- Do the projects overlap in the timing of effects?
- Do the projects overlap in the location of effects?

Figure 6-1: Potential Cumulative Effects Project Inclusions List



If effects of the other activities are expected to overlap in type, time, and space, it was assumed that those activities will act cumulatively and an assessment for cumulative effects is required.

A summary of the projects included in the cumulative effects assessment is provided in **Appendix E**. The complete Project Inclusions List considered by each valued component are included in the respective Technical Support Documents.

6.8.3 Spatial Data and Mapping

To accompany the Project Inclusions List, spatial data files were obtained from available online sources or provided by members of the Project Team, where available, and compiled into a Project Inclusions List map and data set for use by disciplines as part of their cumulative effects assessment.

Footprint data for most activities was not publicly available at the time the Project Inclusions List was prepared, therefore, the buffers noted in **Table 6-3** were assumed and applied per activity type.

Table 6-3: Buffers Applied to Activities on the Project Inclusions List

Type of Disturbance	Feature Type	Buffer	Comment / Rationale
All-Season Road	Linear	100 metres	To account for impacts on each side of the line
Community	Polygon	500 metres	Buffer applied to account for future growth
Mine	Point	2.5 kilometres	These projects noted as points as no footprint info was publicly available
Other	Point	2.5 kilometres	These projects noted as points as no footprint info was publicly available)
Other (small projects)	Polygon	100 metres	Buffer applied to account for impacts as no footprint info was publicly available
Railway	Linear	100 metres	To account for impacts on each side of the line
Trail	Linear	100 metres	To account for impacts on each side of the line
Utility Line	Linear	100 metres	To account for impacts on each side of the line
Winter Road	Linear	100 metres	To account for impacts on each side of the line

However, the following projects are in closer proximity to the Community Access Road and are more likely to have a temporal and / or spatial overlap. Therefore, a box was drawn based on the footprint shown on the aerial image of the project to capture the possible impacts and potential land for future development or expansion of the projects.

Since the box represents the footprint of the projects, an additional buffer was not applied. These projects include the following:

- Eagle's Nest Project;
- Greenstone Gold Mine;
- Victor Mine (closed);
- Copper - Palladium Project;
- Wataynikeneyap Powerline;
- Magino Mine;
- Island Gold Mine;
- Goliath Gold Project;
- Springpole Lake Gold Project;
- Crawford Nickel Project;
- Hammond Reef Project;
- Côté Lake Project;
- Great Bear Gold Project; and
- Upper Beaver Gold Project.

Refer to **Figure 6-1** for the complete Project Inclusions List map.

6.8.4 Cumulative Effects Assessment

Once other past, present, and reasonably foreseeable activities or projects were screened, those activities that may act cumulatively with the Community Access Road were carried forward into the cumulative effects assessment. Potential cumulative effects for each valued component were identified by reviewing the combined effects of the Community Access Road and the other activities listed in the Project Inclusions List. The assessment considered effects to both local and regional populations.

In cases where the effects of other activities are anticipated to act cumulatively with the Community Access Road, the cumulative effects assessment may explore additional technical and economical feasible mitigation measures beyond those that are publicly known or reasonably foreseeable to be implemented by the proponents of the activities on the Project Inclusions List. Proposed mitigation measures as part of the cumulative effects assessment are outlined in **Section 10**.

Information provided by Indigenous Knowledge Holders, Indigenous community members, regulators, and public stakeholders was used to develop the approach and

assessment conducted. A Cumulative Effects Consultation Report was developed detailing activities conducted, and input received, through all phases of the Assessment Process (Appendix X).

The cumulative effects assessment was completed in accordance with the *Impact Assessment Act* (Government of Canada, 2019b) methods, as well as the Tailored Impact Statement Guidelines and the Terms of Reference.

6.9 Identifying Follow-up and Monitoring Programs

It is important that mitigation measures are achievable, measurable, verifiable, and monitored for compliance and effectiveness throughout all temporal phases of the Community Access Road (in other words, construction, operations and maintenance phases). Recommended environmental monitoring will verify predicted environmental effects, evaluate the effectiveness of mitigation and enhancement measures, and identify the process to be followed if these mitigation and enhancement measures are not effective. Monitoring programs for each discipline are described in **Section 14**.

7. The Engineering of our Road

7.1 Description of Our Road

7.1.1 Overview

The Community Access Road will consist of a new all-season, multi-purpose road from the existing Painter Lake Road, located approximately 57 kilometres north of Nakina, Ontario, to Marten Falls (**Figure 1-1**). Options for road ownership, operations and maintenance activities, and liability are being discussed with the Province.

Table 7-1 presents the anticipated components of the Community Access Road.

Table 7-1: Anticipated Components of the Community Access Road

Components	Detail
All-season gravel road	• Total length: approximately 184 kilometre, of which 8 kilometre will be within the Marten Falls First Nation reserve • Right of way: approximately 100 metres wide, cleared to a width of 60 metres • Two-lane roadway, approximately 12 to 13 metres wide • Posted speed limit of 80 kilometres per hour • Temporary access roads related to road and bridge construction sites are included within the right-of-way
Bridge and / or culvert installations for river and stream crossings	• 47 bridges • 21 culverts
Borrow areas, aggregate and borrow source areas, and aggregate sites	• 40 aggregate site
Temporary access roads to potential construction camps	• 7 roads • 10 metres wide
Temporary access roads to potential aggregates sites	• 28 roads • 10 metres wide
Temporary work areas and camps	• 7 camps
Road maintenance facilities, rest stops, and pull-out areas	• To be confirmed during detail design

The details of each component are based on the preliminary design and are subject to change.

7.1.2 Components

7.1.2.1 Roads

Additional temporary clearing occurring in certain locations to accommodate construction activities, access, borrow areas, aggregate source areas, aggregate sources, and temporary infrastructure such as staging areas, camps, and debris and / or timber stockpiles will be required. Auxiliary project components required for the construction of the Community Access Road (in other words, staging areas and aggregate sites, etc.) will not be located on Provincial Park and Conservation Reserve Authority Lands.

The Community Access Road will have a design speed of 100 kilometres per hour, with a posted speed limit of 80 kilometres per hour. This design standard will allow year-round use by commercial and private vehicles, in accordance with size and weight limitations outlined in Ministry of Transportation regulations.

The predominant building materials for the Community Access Road will be blasted rockfill and / or composite borrow excavation material, capped with granular surface material. If feasible, the majority of the blasted rockfill will be obtained from rock outcrops within and / or adjacent to the right-of-way. If material within the right-of-way is unavailable, other proposed aggregate sites have been identified to provide the embankment and roadbuilding materials.

Early investigations on permafrost have shown the Community Access Road is located within the isolated patches of the permafrost zone (Heginbottom et al., 1995), with some possible locations identified in test holes and helicopter reconnaissance by KGS Group (2019a, 2019b). Excavation within identified permafrost areas will be avoided whenever possible, as cutting into surface vegetation can disturb the permafrost regime resulting in thaw and unstable ground. As a precaution, the design will primarily use fill along access roads to minimize permafrost degradation and will follow the recommendations outlined in a Permafrost Management Plan.

The required embankment thickness, based on the terrain type(s) encountered, is an average 1.5 metres thick embankment with 3H:1V side slopes (to be confirmed with the Ministry of Transportation of Ontario) and geotextile reinforcement added between the existing ground and the embankment (where required). More details on standard road construction can be found in **Section 7.2.3**.

7.1.2.2 Bridges and Culverts

Bridges and culverts will be required to cross over the creeks and rivers, with the type of crossing determined by the size of the stream. These will be chosen as follows:

- Culverts will be used for crossings less than 5 metres wide, measured from one bank to the other;
- Clear-span bridges will be installed for crossings between 5 and 30 metres wide. These bridges extend completely over the watercourse; and
- Bridges with piers and abutments will be used for water crossing longer than 30 metres.

Additional design measures and wildlife crossing mitigation options will be incorporated on select bridges and culverts located in high-suitability habitat for Species at Risk and road-mortality-vulnerable species (in other words, amphibians and reptiles). These measures will be further considered during detail design and implemented during construction at prioritized locations to facilitate safe wildlife passage above or below the Community Access Road and reduce the risk of barriers to movement across the Project area during operations.

Culverts

Culverts will be installed at locations where spring-melt or storm runoff needs to be diverted from one side of the Community Access Road to the other to prevent flooding and / or erosion. The purpose of equalization culverts is to maintain the existing surface water drainage patterns in the area. Culverts will be installed as construction progresses along the Community Access Road.

Culverts will range from small-diameter corrugated steel pipes for overland water drainage to large concrete box or steel arch culverts for smaller waterways. The expected proposed culvert sizes are as follows:

- Small-diameter corrugated steel pipe culverts: a minimum of 900 millimetres in diameter;
- Large concrete box culverts: approximately 3 to 4.5 metres square; and
- Large steel arch culverts: range from approximately 3 metres up to 8 metres in diameter with a semi-circular shape.

Bridges

The bridges will accommodate two lanes of traffic with appropriate shoulder widths. The foundation support for the bridge abutments is expected to consist of driven steel piles, drilled cast-in-place concrete piles, or concrete spread footings. More information can be found in **Section 7.2.3**.

7.1.2.3 Embankment Material Borrow Areas, and Aggregate Site Areas

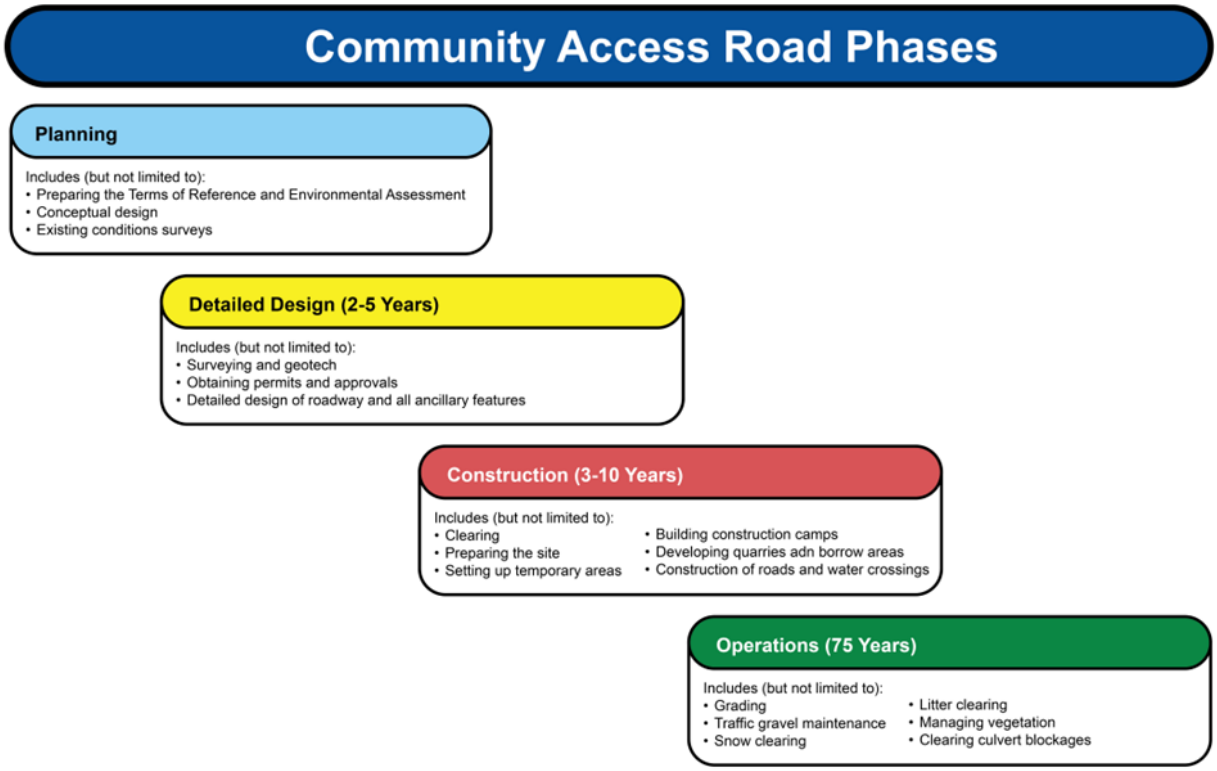
Pits and quarry areas (for example rock outcrop locations, sand and gravel pit locations) will be developed to provide crushed rock and granular materials for the construction of the Community Access Road and temporary access roads. Temporary access roads will be established to connect various components of the Community Access Road.

Only material that has been cleared through a geochemical verification process will be used to avoid acid rock drainage or metal leaching. Monitoring of runoff will be conducted from an erosion and sediment control perspective.

7.2 Our Road Activities

This Environmental Assessment / Impact Statement has been completed based on a preliminary design of the roadway, meaning that the details on how the road will be built and operated are still conceptual and presented at a high level. Projects of this type are typically developed following a multi-phase process, which is outlined on **Figure 7-1**.

Figure 7-1: Community Access Road Phases



7.2.1 Planning and Preliminary Design

The first step in the process is planning, which occurs in multiple phases over many years and generally begins with developing the concept for the Community Access Road. The concept for the Community Access Road has been discussed for more than a decade. For the purpose of this Environmental Assessment / Impact Statement, official environmental planning began in 2019 with the initial drafting of the draft Project Description and the development of the draft Terms of Reference.

A critical part of the planning process involves collecting information on the existing environment. This is achieved through field programs, desktop studies, and discussions with Indigenous peoples, the public, and regulators. The collected information is then used to inform the Environmental Assessment / Impact Assessment process and is documented in **Section 8**.

As discussed in **Section 5**, Marten Falls First Nation requires approval from both the Province and the Agency to construct the Community Access Road. This approval is granted under the provincial *Environmental Assessment Act* (Government of Ontario, 1990a) and the federal *Impact Assessment Act*. Once received, this marks the conclusion of the planning process.

The planning process includes the development of a preliminary design. Preliminary design refers to the initial thoughts on the Community Access Road, which includes the proposed alignment of the road and typical cross-sections of the road and bridges. A key component of the preliminary design is the development of a general route for the Community Access Road within a 5-kilometre-wide corridor, as shown on **Figure 4-7**. Such a wide corridor was chosen to allow for flexibility when completing the detail design. It allows engineers to move the final placement of the Community Access Road within the 5-kilometre buffer to account for Indigenous Knowledge, consultation, and the information presented in this Environmental Assessment / Impact Statement. This exercise is known as micro-siting. As part of the current planning process, the preliminary design has been reduced through micro-siting to a 100-metre corridor.

7.2.2 Detail Design

The design process, also known as detail design, typically begins after the conclusion of the planning process. However, it can begin while the project is awaiting a decision from the regulators. It should be noted that, if approval for the Community Access Road is granted under the provincial *Environmental Assessment Act*, the Community Access Road must follow the approval conditions within the approval.

Detail design, as the name suggests, is when the engineers work on the finer details of the Community Access Road design. This includes determining the exact type of bridges and culverts, refining the curves and grade of the roadway, planning the details of staging areas (including their location) and permanent features, and designing access roads to the proposed pits and quarries. During this phase, permits for items such as aggregate quarries will be obtained. This Environmental Assessment / Impact Statement includes descriptions for items that must be completed during this phase. Detail design is expected to take several years to complete.

7.2.2.1 Construction Phasing

An important aspect of the planning process is construction phasing, which is typically completed as part of the detail design. The engineers need to consider not only the seasons and associated weather conditions, but also sensitive timing windows. These timing windows are in place to minimize potential impacts on the environment (for example fish and wildlife) and people (for example cultural events). For example, tree clearing is ideally performed outside the nesting periods for migratory birds to avoid disturbing birds and their nests. If seasonal windows cannot be adhered to, additional permitting and mitigation measures will be required.

Construction of the Community Access Road could start at multiple location simultaneously. For example, construction could start at both the southern end near Painter Lake Road and the northern end near Marten Falls at the same time. This approach could expedite construction compared to starting from a single location. The number of construction locations will be determined as part of detail design and will depend on several factors such as funding availability, material supply, construction equipment, labour resources, and site accessibility.

For the effects assessment / impact assessment, the scenario with the largest construction extent was considered. This scenario represents the maximum level of construction activities occurring simultaneously and, consequently, the greatest potential impacts. It is the more conservative approach to the effects assessment.

7.2.3 Construction

Construction of a project typically begins after approval has been obtained and the detail design phase is complete. However, in some cases, detail design and construction may overlap and occur simultaneously. The construction approach will be determined early in the detail design phase. It should be noted that, if approval for the Community Access Road is granted under the provincial *Environmental Assessment Act*, the Community Access Road must follow the approval conditions within the approval.

Given the remote location of the Community Access Road, there are some differences from road constructed generally in Southern Ontario, one of these is that the Community Access Road will cross peatlands. The proposed approach for construction over these peatlands will aim to keep the peat in place while promoting natural water flow. This will be accomplished by placing large rocks approximately 1 metre in diameter over the peat. This will allow the water to continue to flow in between the large rocks, in more technical terms this is described as having a permeable embankment made of quarried rock or selected granular material. The permeable embankment will be supported by heavy geogrid to prevent clogging and allow settlement. Additional information on the construction approach and how it has been applied to comparable roads is provided in Appendix W.

Construction is expected to take between 3 and 10 years, with a partial overlap with the planning and design phase. If a combined detail design and construction model is chosen, construction could start as early as 1 year after the Environmental Assessment / Impact Statement is approved.

The general order of activities are as follows:

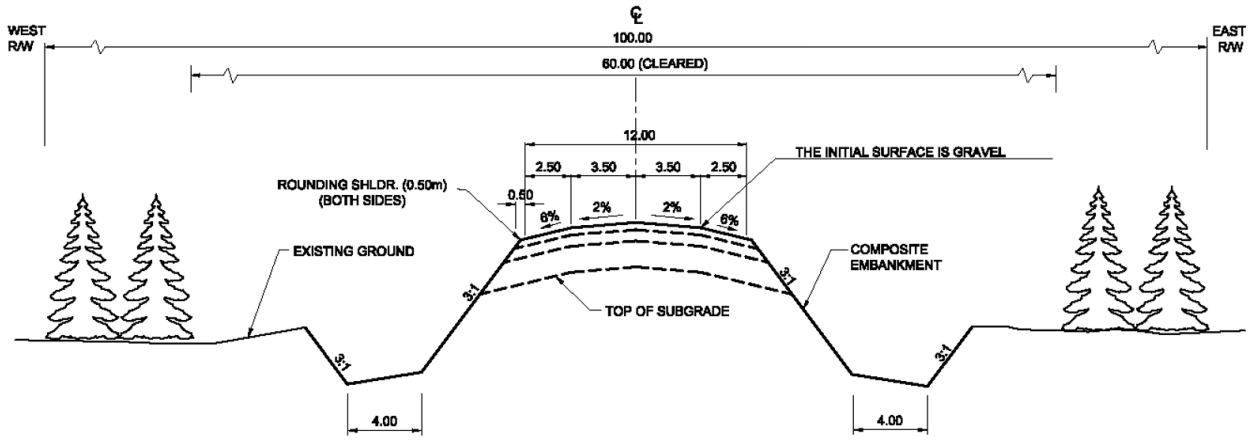
- Construct temporary access roads to reach notable locations such as aggregate sites, camps, and road and bridge construction sites;
- In conjunction with this, right-of-way clearing and grubbing, as well as topsoil stripping, will begin. These crews may move ahead to clear aggregate sites and other key areas to allow for early access to certain portions of the work; and
- During the first winter, snow fill crossings may be used to cross major wet areas, without impeding the free movement of water or the passage of fish, to enable access for the construction of roads, bridges, and major culverts. A snow fill crossing is a temporary, winter-only stream crossing constructed by filling a small watercourse channel with clean, compacted snow.

Following the first winter, after spring breakup, major embankment construction will begin in strategic locations. The embankment, which forms the bulk of the road, will consist of blasted rock, clay, or granular fill. Granular material will then be placed on top, forming the surface of the road.

Embankment construction will continue into the fall and winter, with winter embankments being built out of quarried rock or pit run to minimize cuts in frozen ground. Road topping, using aggregate materials, will be placed on each road segment as they are completed during summer / fall conditions.

Substantial completion is when construction has reached a point where final inspections and certifications begin. During this period, any deficiencies are identified and corrected. This process continues until final completion, at which point the operations phase begins, and the road opens to public use. **Figure 7-2** illustrates a typical cross-section of the road. Details of the typical construction activities for this type of project are discussed in the sections that follow.

Figure 7-2: Typical Cross-Section of the Community Access Road



7.2.3.1 Clearing and Grubbing

The first step in construction involves clearing and removing vegetation and grubbing the soil (in other words, remove remaining soil, stumps, and other organic material). This is done to prepare the Construction Development Area (a 100-metre-wide right-of-way) for road construction, temporary construction staging areas, and access roads (**Figure 7-3**). Hazard trees (those with potential to fall onto the work site) along the edge of the Construction Development Area will also be removed. Vegetation clearing and grubbing will also occur at construction laydown and staging areas, as well as temporary construction camps. Trees will mainly be removed using heavy machinery, although hand-clearing (for example chainsaws) may be used for small-scale efforts, such as those around sensitive features (**Figure 7-4**).

Figure 7-3: Example of Typical Access Road Clearing Activities

Source: Image created by Adobe Firefly (2024)

Figure 7-4: Example of Typical Clearing Activity

Source: Image created by Adobe Firefly (2024)

Brush and Timber Disposal

Where possible, usable, merchantable timber will be segregated and collected for reuse. Timber and materials that would typically be considered unusable may also be stockpiled to restore areas temporarily disturbed during construction (**Figure 7-5**). All other unusable timber and material will be collected and burned at designated sites.

Figure 7-5: Examples of Stockpiled Timber

Source: Image created by Adobe Firefly (2024)

Temporary Access Roads

Temporary access roads will be required during construction of the Community Access Road to access various locations along the Construction Development Area. This may include short parallel detours to facilitate construction around sensitive features and watercourses, as well as access roads to potential pits and quarries. In each instance, vegetation will need to be removed, but to a lesser extent than the width of the Construction Development Area, and grubbing / grading may be needed to allow for the safe passage of construction vehicles along the temporary access roads.

The purpose of the temporary access roads is to facilitate emergency access, equipment, and personnel, and to provide access to and from quarries, borrow areas, and aggregate source areas. Temporary roads will be developed within the right-of-way of the Community Access Road. The temporary access roads will be cleared, to a width of approximately 10 metres to accommodate equipment movement.

7.2.3.2 Blast Rock Production for Roadway Subgrade (Drill / Blast / Haul)

Quarries will be developed at aggregate sites (**Figure 1-1**) to provide crushed rock and granular materials for construction of the Community Access Road and temporary access roads. Most of the rock required for construction is expected to come from the aggregate sites developed as part of the Community Access Road. Heavy machinery, such as drill rigs, aggregate production equipment, and explosives will be required to access and produce materials from the potential aggregate sites. These aggregate sites will be subject to approval under the Ontario *Aggregate Resources Act* (Government of Ontario, 1990b). In addition, aggregate sites may require permits to take water for activities such as drill cooling, aggregate pit dewatering, and aggregate washing. An Environmental Compliance Approval might be necessary for the management of aggregate wash water.

Explosives will be transported, handled, and stored in compliance with federal and provincial regulations and will only be used by trained professionals. The storage of explosives will be in specially designed and secured containers and set back and isolated from all other activities.

Construction activities will include drilling, blasting, crushing, screening, piling, loading, hauling, and stockpiling of overburden materials and timber.

7.2.3.3 Aggregate Production for Processed Layers (Drill / Blast / Process / Stockpile)

To obtain the necessary aggregate material required for construction activities, drilling and blasting will be required at potential aggregate sites. Heavy machinery, such as drill rigs, aggregate production equipment, and explosives will be used to access these aggregate sources. Explosives will be transported, handled, and stored in compliance with regulations, and will only be used by trained professionals. Large-scale heavy equipment will be used to crush the aggregate to the desired size and the material will be stockpiled until it is needed (**Figure 7-6**). Aggregate is expected to be transported using large articulated haul trucks.

Figure 7-6: Example of Typical Aggregates Stockpile

Source: Image created by Adobe Firefly (2024)

7.2.3.4 Road Construction

Road construction activities will begin with contouring and blasting of rock outcrops along the Construction Development Area. Organic materials will be stripped, stockpiled, and may be used along the road grade slope and / or back slopes to encourage regeneration. Materials, including rock fill, aggregate, and composite material will be loaded, hauled, dumped, spread, graded, compacted, trimmed, and shaped before final surfacing with gravel (**Figure 7-7**). Geotextile fabric will be placed in poor subgrade areas to improve the integrity of the Community Access Road. Roadway signs will be installed, sedimentation control measures will be implemented, and disturbed areas will be revegetated, as outlined on the required Rehabilitation Plan to align with the Aggregate Resources of Ontario: Site Plan Standards (Ministry of Natural Resources and Forestry, 2020a).

Figure 7-7: Example of a Vehicle Hauling Aggregate Materials

Source: Image created by Adobe Firefly (2024)

7.2.3.5 Bridge Construction (Long and Short Span)

Where necessary, water crossing structures (for example bridges and culverts) will be installed along both the Community Access Road and temporary access roads (**Figure 7-8**). Proper water crossing techniques and mitigation measures will be implemented to minimize effects to the feature being crossed. Where culverts are required, they will be sized appropriately in accordance with the necessary approvals. Construction activities will include the installation of approach embankments, foundations, substructures, superstructures, traffic protection measures, and erosion control measures.

Figure 7-8: Example of Typical Bridge Construction

Source: Image created by Adobe Firefly (2024)

Short-span bridges, typically used for crossings with spans under 40 metres, can generally avoid in-water work, which is a key distinguisher from long-span bridge construction.

The typical construction process for bridge installation will include the following key activities:

- Installing temporary erosion and sediment control measures;
- Mobilizing equipment, materials, and personnel to the site;
- Surveying and laying out the works;
- Clearing vegetation;
- Preparing the site and constructing geosynthetic reinforced soil embankment approaches;
- Installing foundation piles at the abutment locations;
- Installing pile caps at the abutment locations;
- Installing riprap, where required, to protect the abutments and slopes;
- Installing girders and deck panels, where required;

- Constructing approach slabs;
- Installing traffic barriers on the deck and guardrails at the approaches; and
- Cleaning up the site and demobilizing.

7.2.3.6 Temporary Construction Camps

Due to the remote nature of the Community Access Road, the use of temporary construction camps will be required to support construction activities. Vegetation will be cleared in areas designated for the camps. Grubbing, grading, and the placement of aggregate will be required to establish a solid foundation for the camps. Trailers and temporary building structures will be installed.

During the operation of the camps, management and transportation of both potable and wastewater, as well as refuse, will be required. The method of domestic sewage disposal at temporary construction camps will be determined during detail design. Options may include holding tank systems with off-site disposal or on-site leaching beds. Food waste and other organic materials will be reduced using portable site incinerators and the ashes disposed of at off-site approved waste facilities.

The camp facilities will also include a site office with internet and telephone services. Typically, camp facilities consist of trailers mounted on sleighs or wheels, which can be towed to and from the camp location during the winter months using tracked vehicles when the ground is frozen. The camps are expected to be located either along the Construction Development Area or near the proposed aggregate sites. Construction camps will not be located in or within 500 metres of *Provincial Parks and Conservation Reserves Act* lands.

In addition, temporary fuel storage, camp, and maintenance facilities will be required. Typical camp facilities will include:

- Dining trailer;
- Accommodation trailers for personnel;
- Toilet and bathing facilities;
- Waste storage facility;
- Mechanic shop;
- Fuel storage facility; and
- Power supplied by onsite diesel generators.

The number of workers staying at the camps will fluctuate depending on the nature of the camp and its intended construction scope. However, extra capacity is usually

included for visitors and as a contingency in case additional personnel are required to meet schedule and production requirements. The locations of the camps may vary as activities progress along the alignment. It is anticipated that the scope of work for the Community Access Road will require a 200-person camp and a 50-person contingency camp located outside of the Community. Maintenance facilities may be setup at various camps depending on the nature and timing of the temporary infrastructure.

Water Use for Temporary Construction Camps

Camp operations will require potable water for the following purposes:

- Drinking and kitchen use; and
- Cleaning and servicing washrooms.

At peak, each camp operation may require an average of 205 litres per person per day. A construction camp operating at peak capacity may require up to 61.5 cubic metres of water per day. Final water demand requirements will be determined as part of the detail design phase. Water use activities will be subject to a Permit to Take Water in accordance with provincial requirements (Government of Ontario, 2024a).

7.2.3.7 Fuel and Oil Storage

Fuel and oil needed for the camps, aggregate source, and road construction activities will be stored in double-walled storage tanks. Double-walled tanks consist of an inner tank and a secondary outer tank, providing enhanced protection against potential spills. These tanks will be subject to permits and approvals obtained during the detail design phase.

Camps may be serviced by propane and / or generators. Heavy equipment will be fuelled by a mobile fuel truck. Oil and other lubricating fluids will be stored in containers with integrated secondary containment. Similar to double-walled tanks, secondary containment provides an added level of protection against potential spills.

A Spill Contingency Plan will be prepared during the detail design phase and refined by the owner / operator. This plan is required even though fuel and oil will be stored in double-walled tanks or within secondary containment. In general, a Spill Contingency Plan incorporates best management practices and includes mitigation measures, response timelines, spill response procedure information, equipment, safety, communications, and training. The plan also addresses the transportation, storage, and handling of hazardous materials and includes contingency measures to support decision-making in the event mitigation measures are ineffective, with a clear distinction between mitigation measures and contingency measures for responding to a release.

This makes sure that in the event of a spill workers are prepared, know how to respond, and have access to the appropriate equipment to contain the spill as quickly and efficiently as possible.

7.2.3.8 Equipment

A variety of equipment will be used during construction. All maintenance and construction equipment and materials will generally be parked within the Construction Development Area and suitable spill containment units will be used where required. However, some equipment may also be parked within the proposed aggregate sites.

7.2.3.9 Temporary Infrastructure for Construction

Temporary laydown areas, staging areas, and stockpile areas are anticipated to be established at various locations along the Construction Development Area and / or near other components of the Community Access Road. These areas are proposed to support crews and store equipment, vehicles, materials, and supplies.

7.2.3.10 Construction Waste

A Waste Management Plan will be developed during the detail design phase.
In general, this plan will include collection, transportation, reduction, reuse, repurposing, recycling, prevention, disposal of waste, and preventative measures to address wildlife interactions. The Waste Management Plan will, at a minimum, meet the requirements of Ontario Regulation 347: General - Waste Management (Government of Ontario, 1990c) to make sure that disposal / incineration, temporary storage, and removal of waste follow the guidelines.

Solid Waste

Waste management and disposal for the Community Access Road will be done in accordance with Ontario's *Environmental Protection Act* (Government of Ontario, 1990d). In preparation for construction, a Waste Management Plan will be developed, providing details such as types of waste, volumes, waste storage, and disposal.

Approved waste facilities near the Community Access Road will be considered and identified during the detail design phase of the construction. Petroleum wastes produced during construction (for example oils and greases) will be properly collected, stored, managed, and disposed of or recycled at an approved licensed disposal facility. General Registration under Ontario Regulation 347 will be adhered to with respect to hazardous waste and liquid waste management.

7.2.3.11 Wastewater

The method of domestic sewage disposal at temporary construction camps will be determined during detail design phase. Disposal options may include holding tank systems with offsite disposal or onsite leaching beds designed in accordance with applicable codes and approvals. All required permits and authorizations will be acquired for construction and operation.

Where subsurface sewage disposal systems are proposed, they will be designed in accordance with Regulation 332/12: Building Code under the *Building Code Act* (Government of Ontario, 1992) for systems under 10,000 litres per day. For systems exceeding this threshold, approval under Section 53 of the *Ontario Water Resources Act* (Government of Ontario, 1990d) will be obtained.

If required and where feasible, domestic wastewater will be removed by approved disposal trucks and disposed of at wastewater treatment plants with the authorization and capacity to accept this wastewater.

Environmental Compliance Approvals may be required for the construction and use of sewage disposal systems with a design capacity exceeding 10,000 litres per day.

7.2.3.12 Water Use for Construction Activities

Construction activities will require water for the following purposes:

- Road material compaction;
- Concrete mixing, curing, and finishing;
- Portable washroom facilities;
- Aggregate production;
- Dust control;
- Vehicle washing;
- Drilling; and
- Other general service water requirements.

Construction for similar roads generally requires 700 cubic metres of water per kilometre of constructed road. Most of this water is required for compaction to meet the specific design requirements, with the remaining amount supporting activities such as dust control and concrete mixing. Final water demand requirements will be determined as part of the detail design process. Water use activities will be subject to a Permit to Take Water in accordance with provincial requirements (Government of Ontario, 2024a).

7.2.4 Construction Phase Decommissioning

The last step of the construction phase involves the decommissioning of temporary components that are no longer required. These components may include temporary access roads, pits and quarries, and temporary infrastructure (for example camps) not needed for the operation of the Community Access Road. Progressive restoration will be undertaken as temporary components are no longer needed. A Rehabilitation Plan will be prepared for the Community Access Road and will outline measures for vegetation establishment, in alignment with the Aggregate Resources of Ontario: Site Plan Standards (Ministry of Natural Resources and Forestry, 2020a).

Once construction is complete, temporary infrastructure that is no longer needed will be removed and abandoned or decommissioned. Pits and quarries will be rehabilitated and surrendered in accordance with the *Aggregate Resources Act* (Government of Ontario, 1990b). Sand and gravel pits, including temporary access roads leading to the pits, will be decommissioned by backfilling, levelling, compacting, and redistributing soils. Vegetation will be established, as outlined on the required Rehabilitation Plan to align with the Aggregate Resources of Ontario: Site Plan Standards. Temporary access roads leading to temporary quarry areas will also be decommissioned. Temporary quarries not required for maintenance activities will be abandoned and blocked, while quarries will remain gated and blocked to prevent unauthorized access.

7.2.5 Operations

Activities during this phase include vehicular road use, routine grading, adding gravel, vegetation management, snow clearing, sightlines maintenance, sign maintenance, and culvert cleaning. The operations phase starts once construction activities are complete and continues indefinitely, as the Community Access Road will be a permanent infrastructure.

7.2.5.1 Road Operation

It is anticipated that personal vehicles (for example cars, vans, small trucks, and motorcycles) and commercial vehicles (for example larger trucks, up to legal weight and size limits) will use the Community Access Road.

Traffic levels for the Community Access Road are estimated at 700 vehicles per day for the north-south section and 100 vehicles per day for the east-west section of the Community Access Road. These volumes reflect the anticipated peak traffic in 2046.

7.2.5.2 Road Maintenance

Maintenance activities for the Community Access Road will include routine grading, adding gravel, vegetation management, snow clearing, culvert cleaning, and of beaver dam removal. It will also include bridge maintenance, trees and vegetation trimming to maintaining sightlines along the right-of-way, and upkeep of signs and guardrails.

Where possible, aggregate materials will be sourced from the pits and quarry sites built for the Community Access Road, which will operate under an Aggregate Resource License. These materials will be deposited on the road surface using dump trucks, dozers, and graders. Depending on road conditions and use, the loading, hauling, and placement of aggregate will take place annually.

Dust suppression may be applied to road surfaces during the summer months, with water being the preferred option. The choice of dust suppressant will be determined during the detail design phase in collaboration with the operator. Grading and contouring of gravel will also be carried out during the summer.

In winter, snow clearing could be performed using plows, graders, loaders, and dump trucks. The detail design will include areas for snowplow and truck turnarounds, as well as storage for both equipment and materials. Road maintenance will adhere to typical Ministry of Transportation of Ontario standards and requirements. Vegetation control will be completed through mechanical means such as mowing and sawing. During the winter, the road will be snow packed and sanded.

7.2.6 Decommissioning

There are currently no plans to decommission the Community Access Road, as it is anticipated to be a permanent infrastructure. Therefore, future suspension, decommissioning, and eventual abandonment are not considered in this Environmental Assessment / Impact Statement.

Discussions are ongoing between Marten Falls First Nation and the Province regarding ownership and maintenance responsibilities for the Community Access Road.

8. Life on Our Land

As mentioned in **Section 6**, environmental studies have been completed to document and assess existing natural, socio-economic, and cultural environmental features for both route alternatives and their associated temporary infrastructure.

Existing environmental conditions are the current state of the environment in the study area at the time of assessment. This includes information on how past activities influenced the way the environment exists today. These conditions are used to predict the environmental effects of the project. The following sections summarize the current state of the natural, socio-economic, and cultural environment.

In and around Marten Falls there are many disciplines which were grouped into the following categories so they could be studied further: water, land and people. These groupings were chosen to reflect the interconnectedness of the effects. **Table 8-1** outlines the specific disciplines identified for each group. Technical Support Documents for each discipline are available in **Appendices F** to **W**.

Table 8-1: Valued Component Groupings

Grouping	Discipline	Section
Water	• Surface Water • Fish and Fish Habitat • Groundwater and Geochemistry • Peatlands	8.1
Land	• Vegetation • Wildlife • Birds • Ungulates • Physiography, Terrain and Soils	8.2
People	• Aboriginal and / or Treaty Rights and Interests • Acoustic and Vibration Environment • Cultural Heritage • Archaeology • Atmospheric Environment • Community Well-Being • Land and Resource Use • Visual Environment	8.3

As described in **Section 6.6**, the existing condition in this Environmental Assessment / Impact Statement is described for both route alternatives (Alternative 1 and Alternative 4 as discussed in **Section 4**), and this information was used to inform the selection of a Preferred Route.

Throughout the refinement of the Environmental Assessment / Impact Statement, the draft materials were updated to incorporate Indigenous Knowledge and to address comments received during the draft review period. The final version includes updated summaries and findings within the Technical Support Documents provided in the appendices.

8.1 Water

Marten Falls First Nation (Oji-Cree translation, Wegwajihwana) emphasizes the importance of water, as water is life-giving to the land and all species of life. Major water flows in the Project Study Area are towards the Attawapiskat and Albany rivers, and flows from these major rivers into James Bay (Oji-Cree translation, Wee-nee-peg-kook). Peatlands are more complicated and can locally flow in almost any direction [Wegwajihwana Ininiwag (Marten Falls First Nation) Draft Community-Based Land Use Plan; Marten Falls First Nation, 2020]. This section (**8.1**) details the existing condition of surface water, fish and fish habitat, groundwater and geochemistry and peatlands within the Project study areas.

8.1.1 Indigenous Knowledge of Water

Information provided by Indigenous Knowledge holders, recognized as such by their Indigenous community, has been collected through literature review or shared directly by Indigenous communities in support of the Community Access Road through face-to-face meetings or receipt of Indigenous Knowledge reports. The information used to inform this reporting related to the water disciplines is described in **Table 8.1-1**. Some information that has been provided is considered confidential. Where possible this information has been summarized at a high-level, removing any confidential details and is included in **Table 8.1-1.** Where this is not possible it has been excluded from **Table 8.1-1** and has still been considered throughout the Technical Support Documents where applicable.

Table 8.1-1: Indigenous Knowledge of Water

Topic	Indigenous Community	Details
• **Surface Water Quantity** • **Surface Water Quality**	• Marten Falls First Nation (2023a)	• Marten Falls First Nation noted a general interest in combining western science hydrology with Indigenous Knowledge.
• **Cultural Significance**	• Fort Albany First Nation (Firelight Research Inc., 2024) • Nibinamik First Nation (Dillon, 2024a) • Weenusk First Nation (MNP LPP, 2024a)	• Fort Albany First Nation highlighted the importance of freshwater ecosystems, noting that they play a central role in the life of the community – stating that rivers, lakes, and muskeg provide essential habitat, as well as water for drinking, cultural use (for example, ceremonial / healing), and travel. The community noted that the water cycle throughout the year is reflected in the teachings of the six seasonal cycle and is closely related to Fort Albany First Nation's use of their traditional territory (including the boreal forest of the James Bay Ecoregion, coastal areas of James Bay and Hudson Bay, and the Albany River). One community member noted that the different seasons and moons are named in Omushkegowuk / Cree after specific seasonal water cycles, which explain the movement of water at that time of year, and the activities of different animal species based on the changes to water. • In addition, Fort Albany First Nation also noted the importance of being able to collect drinking water on the land – such as scooping a cup of water from the Albany River or lakes on the mainland. • Nibinamik First Nation noted the cultural significance of the various rivers, streams, and lakes throughout their traditional territory including Nibinamik Lake and Neskantagawii siipi. The community noted that, as Anishinaabek, they have their own intimate relationships with the water, and women are the keepers of the water. • Weenusk First Nation highlighted the importance of the Winisk River, the Shamattawa River, and Shamattawa Lake. The community noted that the Winisk River is the primary source of water within the community's traditional territory. The community noted that the river supports Weenusk's traditional areas, including important resources such as fish, wildlife, and vegetation, as well as influences and supports community members' ability to travel throughout their traditional territory and connect culturally with significant sites and areas. • One community member from Weenusk First Nation noting the following about water: "Water is very important. It is part one of our medicines, because we use water to for ceremonies, like sweat lodge. If we didn't have water, then it would be a big problem." • Weenusk First Nation noted an importance in collaboration between partner communities, as well as consideration of Weenusk Governance and Stewardship practices to prevent downstream impacts within their community as Peawanuck is located furthest downriver from other communities and potential Project-related activities.
• **Surface Water Quantity** • **Damming and Diversions**	• Marten Falls First Nation (2023a) • Kashechewan First Nation (MNP LPP, 2024b) • Fort Albany First Nation (Firelight Research Inc., 2024)	• Marten Falls First Nation provided information and concerns about historical and existing conditions related to surface water quantity and previous damming / diversion activities within the Ogoki watersheds. This includes input noting that travel for the community on the Albany River has been impacted by past development including damming and diversion within the watershed including at Rat Rapids, the Root River, Osnaburgh House, and Lake St. Joseph. • Additionally, the Marten Falls First Nation has noted that dams have resulted in low water levels in both the Albany River and Ogoki River, making it hard for members to use waterways for harvesting and fishing as they once did. • Kashechewan First Nation have shared concerns related to observed changes to flow patterns in the rivers that run through their traditional territory, attributed to the damming and diversion of water upriver from the community. One community member noted that "the water has declined by 50 percent in the last 30 years". Another community noted that when the water is really low, people must sometimes drag their boats to get through the rapids. • Kashechewan First Nation have shared concerns related to water levels in surface water features and peatlands resulting from watercourse crossings and road construction. • Fort Albany First Nation provided observations related to how surface water and fish habitat have been impacted by damming and water control structures, noting changes to water quality and quantity. The community discussed how the dams at Lake St. Joseph and Big Trout Lake control the water level on the Albany River, resulting in downstream effects in the Fort Albany area and has led to decreased access to preferred hunting locations. Community members provided feedback describing potential damming around the Marten River, observations that they used to travel up the Chemahagan River in the 1970s for moose, but now have difficulties doing so, as the river is too dry, and impacts the safety, natural cycle, and timing of river break-ups in the spring due to dam releases causing the ice to break. One community member from Fort Albany First Nation noted: "It's really dry now, just when I went to Albany recently … in the summertime. That river used to be full of water. Now it's just rocks and boulders. People drive around their trucks now or four-wheelers [in exposed section of the river] because of lack of water."

Topic	Indigenous Community	Details
• **Concerns and Mitigation Measures** • **Surface Water Quantity** • **Surface Water Quality** • **Sediment Quality**	• Aroland First Nation (Shared Value Solutions, 2024) • Marten Falls First Nation (Marten Falls First Nation, 2023a; Appendix O) • Kashechewan First Nation (MNP LPP, 2024b) • Fort Albany First Nation (Firelight Research Inc., 2024) • Weenusk First Nation (MNP LPP, 2024a)	• Marten Falls First Nation provided input on concerns related to surface water quality. This includes: – Generalized concerns related to surface water contamination / pollution (in other words, dust, oil, chemicals, litter); – Concerns related to how the construction of bridges may result in effects on surface water; – Concerns related to impacts on water quality due to increased traffic to the area; and – Concerns related to beavers building dams around culverts built along the road, impacting water flow. • Marten Falls First Nation also provided several suggestions related to potential mitigation measures specific to surface water quality including: – Safe storage and handling areas for fuelling / refuelling; and – Implementation of dust and spill control / prevention measures. • Aroland First Nation noted generalized concerns relating to how increased traffic will result in overall impacts on the natural and atmospheric environment. • Aroland First Nation also highlighted concerns related to the potential for accidents along the road, resulting in contamination of the waterways and surrounding environment in the event of a truck overturning, sliding off the road in poor weather, and contamination spills. One interview participant spoke of their previous experience with seeing contamination from oil tanks and garbage out on the land and was concerned that this could happen again if there is an accident on the road close to the water. While they noted the contamination they saw was cleaned up with bales of hay, they also emphasized that doing more to prevent these incidents is necessary. • Kashechewan First Nation have also noted concerns relating to the potential for fuel spillage and associated contamination impacts on surface water features due to previous experiences with development related to Victor Diamond Mine. • Fort Albany First Nation noted the following concerns: – Concerns related to freshwater contamination within surface water features, in particular Albany River, which flows northeast and may potentially transmit Project impacts downstream and “down-muskeg” resulting in impacts that may be felt beyond the Project footprint – into Fort Albany First Nation’s traditional territory towards the coast. – Concerns relating to how the Project might result in impacts on water flow. In particular, relating to how the Project could act as an additional barrier to natural water flow. Fort Albany First Nation also highlight specific concerns related to how the Attawapiskat River, Albany River, Moose River, and Winisk River might be impacted as a result. – Concerns relating to how the project may result in water contamination as a result of accidental spills / pollution (for example, garbage, debris, and waste). – The construction and operations of linear infrastructure (for example, winter roads and transmission lines), as well as associated traffic. • Weenusk First Nation noted concerns relating to the following effects: – Downstream contamination within their traditional territory; – Impacts on air quality due to emissions of fugitive dust from the movement and operations of construction equipment and vehicles; – Lower water levels due to drying; and – Increased erosion and sedimentation near surface waterbodies in proximity to the Project. • Kashechewan First Nation have noted support for the ongoing monitoring of waterways, as well as continued community engagement throughout the Project life cycle related to follow-up and surface water monitoring programs.
• **Concerns and Mitigation Measures**	• Aroland First Nation (Appendix O) • Marten Falls First Nation (2023a)	• Aroland First Nation and Marten Falls First Nation noted concerns related to the contamination of fish, particularly Lake Sturgeon (Acipenser fulvescens; Oji-Cree translation, nameh).
• **Concerns and Mitigation Measures**	• Marten Falls First Nation (2023a)	• Marten Falls First Nation noted concerns related to fish habitat and spawning habitats including increased pollution in the waterways, an influx of overfishing, and the impacts of logging. The Community also noted suggestions for mitigation measures to offset these concerns including erecting physical barriers, building the road farther away from habitat and spawning sites, adequate signage for no fishing areas, increasing Ministry of Natural Resources presence, dust suppression, prohibiting logging near spawning habitats, and additional monitoring of waterways and fish habitat.

Topic	Indigenous Community	Details
• **Culturally Important Species**	• Aroland First Nation (Shared Value Solutions, 2024; Dillon 2024b) • Fort Albany First Nation (Firelight Research Inc., 2024) • Marten Falls First Nation (2021d, 2023b; Appendix O) • Nibinamik First Nation (Dillon, 2024a) • Weenusk First Nation (MNP LPP, 2024a)	• Aroland First Nation identified a number of fish species as culturally important and / or harvested by community members including Brook Trout (speckled trout) (Salvelinus fontinalis; Oji-Cree translation, masamekos), Lake Trout, Lake Sturgeon (Acipenser fulvescens; Oji-Cree translation, nameh), Northern Pike (Esox lucius; Oji-Cree translation, najwabe), Sucker sp. (Catostomidae; Oji-Cree translation, namebin), Walleye (Pickerel; Sander vitreus; Oji-Cree translation, okaas), Pickerel, Sauger (Sander canadensis), Rainbow Trout, and Lake Whitefish (Coregonus clupeaformis; Oji-Cree translation, atikameg), and, Rainbow Trout. • Fort Albany First Nation identified a number of fish species as culturally important and / or harvested by community members including Brook Trout, Northern Pike, Lake Sturgeon, Salmon sp., Sucker sp., Trout sp., Walleye (Pickerel), and Lake Whitefish, and Salmon sp. • Marten Falls First Nation identified a number of fish species as culturally important and / or harvested by community members including Lake Sturgeon, Ling (Burbot; Oji-Cree translation, mihzhash), Northern Pike, Brook Trout, Speckled Trout, Sucker sp., Walleye, and Lake Whitefish. • Nibinamik First Nation noted that fish are harvested by the community and is a traditional food source. • Weenusk First Nation and noted an overall cultural importance of fish to the community.
• **Damming and Diversions**	• Marten Falls First Nation (2023a)	• Human-induced environmental issues including the damming and diversions of waterways within Marten Falls First Nation traditional territory have impacted animal species that rely on these water resources for life and sustenance.
• **Fish Habitat**	• Marten Falls First Nation (2021d, 2023a; Appendix O)	• Marten Falls First Nation noted the presence of a number of observations regarding fish species at different locations throughout their traditional territory including: – Northern Pike, Walleye, Brook Trout, Lake Sturgeon, and Sucker near Snake Rapids (Oji-Cree translation, Ginabic Pawitik). – Brook Trout, Lake Sturgeon, and Northern Pike south of the confluence of the Wabassi River (Oji-Cree translation, Wabihzii Wih Ziibih). – Brook Trout and Walleye south of Long Neck Island (Oji-Cree translation, kiniigo yahway minis). – Brook Trout and Walleye at Gourlie Creek (Oji-Cree translation, Onagwa'ihgan Ziibih), southwest of Trebell Lake. – Brook Trout, Lake Sturgeon, Ling (Burbot), Northern Pike, sucker, Walleye, and Lake Whitefish at Teabeau Lake and the Albany River (downstream of Washi Lake [Oji-Cree translation, Obaashiwizaagaykaniing]). Lake Whitefish and Northern Pike were also noted at Tolfree Lake to the east. – Lake Sturgeon within the Ogoki River and Patience Lake (Oji-Cree translation, Bakihda'hawgan). There are many fish in this area as the water levels tend to be shallow. • Fish habitat (and harvesting activities) within the Albany River, Ogoki River, and Ruby Creek. The presence and harvest of species including Brook Trout, Lake Sturgeon, Northern Pike, Brook Trout, suckers, Walleye, and Lake Whitefish were noted.
• **Fish Habitat** • **Fish Spawning**	• Aroland First Nation (Shared Value Solutions, 2024) • Fort Albany First Nation (Firelight Research Inc., 2024) • Marten Falls First Nation (2023b) • Weenusk first Nation (MNP LPP, 2024a)	• Marten Falls First Nation noted human-induced environmental issues including the damming and diversions of waterways within Marten Falls First Nation traditional territory have impacted animal species that rely on these water resources for life and sustenance. • Marten Falls First Nation noted that water crossings have been identified as a concern, particularly as they relate to spawning areas for fish and the potential for watercourse crossings negatively impacting Lake Sturgeon and Brook Trout spawning areas. A reference to similar / previous historical impacts were made relating to damming at Lake St. Joseph that produced these circumstances. • Fort Albany First Nation provided observations related to how surface water and fish habitat have been impacted by damming and water control structures, noting changes to water quality and quantity and concerns relating to how Lake Sturgeon and other bottom-feeding fish that require cool waters may be impacted. The community discussed how the dams at Lake St. Joseph and Big Trout Lake control the water level on the Albany River, resulting in downstream effects in the Fort Albany area. Community members also noted that the water control structures have impacted the natural cycle and timing of river break-ups in the spring due to dam releases causing the ice to break. One community noted the following regarding water levels: • "It's really dry now, just when I went to Albany recently … in the summertime. That river used to be full of water. Now it's just rocks and boulders. People drive around their trucks now or four-wheelers [in exposed section of the river] because of lack of water." • Aroland First Nation noted impacts onto fish spawning due to damming / diversions along the Ogoki River, which is attributed to the presence of the Waboose Dam, with one community member noting the following: – "You know that dam they got in Ogoki? The Ogoki? That big dam they got, Waboose dam, they call it? That caused a lot of problems for them back then. All the sturgeon and all the river beaver, muskrat. Caused a lot of problems for them. Every time they opened that dam, all those spawning fish would get washed away. Same thing with the little beaver and the little muskrat. Washed them away. Caused a lot of problems back then. And still to this day, that's what's the problem now with that dam. When they release it, everything's gone. And they were saying that, my parents were saying that when the little beavers and the little muskrat, when they were getting born or whatever, they would wash away. Because when they let that dam go, everything that's along the river washes away."

Topic	Indigenous Community	Details
		• Weenusk First Nation also noted observations relating to changes in fish quantities as a result of changes to water levels in nearby systems, noting: – "The number [of fish] has changed, and I think it's because the river system has changed as well (…) The river system has become shallower every year and it's hard for fish to be (…) in the waters where it's shallow.".
• **Fish Spawning** • **Net Set Locations** • **Harvest Locations**	• Marten Falls First Nation (Dillon, 2024; Marten Falls First Nation, 2023b, 2021d) • Fort Albany First Nation (Firelight Research Inc., 2024) • Kashechewan First Nation (MNP LPP, 2024b)	• Marten Falls First Nation noted the presence of a number of observations regarding fish species at different locations throughout their traditional territory, including: – Northern Pike, Walleye, Brook Trout, Lake Sturgeon, and Sucker near Snake Rapids (Oji-Cree translation, Ginabic Pawitik); – Brook Trout, Lake Sturgeon, and Northern Pike south of the confluence of the Wabassi River; – Brook Trout and Walleye south of Long Neck Island (Oji-Cree translation, kiniigo yahway minis); and – Brook Trout and Walleye at Gourlie Creek (Oji-Cree translation, Onagwa'ihgan Ziibih), southwest of Trebell Lake. • Marten Falls First Nation also noted the following: – Brook Trout, Lake Sturgeon, Ling (Burbot), Northern Pike, sucker, Walleye, and Lake Whitefish at Teabeau Lake and the Albany River (downstream of Washi Lake [Oji-Cree translation, Obaashiwizaagaykaniing]). Lake Whitefish and Northern Pike were also noted at Tolfree Lake to the east; – Lake Sturgeon within the Ogoki River and Patience Lake (Oji-Cree translation, Bakihda'hawgan). There are many fish in this area as the water levels tend to be shallow; and – Fish habitat (and harvesting activities) within the Albany River, Ogoki River, and Ruby Creek. The presence and harvest of species including Brook Trout, Lake Sturgeon, Northern Pike, Brook Trout, suckers, Walleye, and Lake Whitefish were noted. • Fort Albany First Nation identified the presence of productive fish habitat at several locations including the rapids along the Albany River near Ogoki, at the mouth of the Henley River, the fork area where the Albany River splits, and at Pledger Lake. The community noted species such as Walleye, Northern Pike, Lake Sturgeon, and Lake Whitefish reside in these areas. • Kashechewan First Nation noted the importance of the pristine fish habitat provided by the Kistachowan Sipi (Albany River) watershed, which flows through Kashechewan First Nation's traditional lands. The community noted that it provides a variety of fish species for harvesting including Northern Pike, Walleye, Lake Sturgeon, Lake Whitefish, and various trout species through angling, gillnetting, and ice fishing. One community member identified, the presence of whitefish in Albany River around August and September each year. • Aroland First Nation noted the following regarding fish habitat and spawning areas: – The presence of a number of fish spawning areas in the upper and lower channels of the Ogoki River, as well as locations within the main channel where Species at Risk, such as Lake Sturgeon are known to reside; – Significance of Patience Lake due to Lake Sturgeon spawning area, noting a desire that the area east of Patience – where a crossing is proposed, remains protected; – The presence of fish spawning areas at Ogoki Lake, Melchett Lake, Tennant Lake, Kapikotongwa Lake, Briarcliffe Lake, Nass Lake, and Durer Lake; and – The Ppresence of fish spawning areas near water crossings at the Kawashkagama River, Kapikotongwa River, as well as the creek connecting Terrier Lake and Hauenstein Lake, and other unnamed creeks. • Spawning or harvesting locations for valued component fish species were identified in relation to the nearest connected waterbody crossing and incorporated into the baseline report (Attachment B) and existing conditions section (Section 5) in the characterization of the fish communities. This included information related to the locations of spawning beds (fish species not identified), Lake Sturgeon net set locations, Northern Pike harvest locations, and Brook Trout locations. Additionally, Marten Falls First Nation noted the presence of a number of observations regarding fish spawning at different locations throughout their traditional territory including: – A general, negative impact of dams on fish habitat and spawning grounds and the impact on Brook Trout populations specifically: – Lake Sturgeon feeding and spawning areas along the Ogoki River; – The Old Man River contains spawning habitat for Brook Trout, notably within the vicinity of sand bars; – Brook Trout are considered to spawn and inhabit the Dusey River. One community member noted fewer fish in comparison to the past in this area after a forest fire approximately 20 years ago; and – Kagiami Falls is a fish spawning area and that Brook Trout, Lake Sturgeon, Northern Pike, and Walleye are present in this area.
• **Oji-Cree names for waterbodies**	• Marten Falls First Nation (2019)	• Marten Falls First Nation noted Oji-Cree and local names were used to first describe waterbodies, followed by the English name, where available.

Topic	Indigenous Community	Details
• **Decline in Fish Population**	• Aroland First Nations (Shared Value Solutions, 2024) • Weenusk First Nation (MNP LPP, 2024a)	• Aroland First Nation noted changes to fish health and populations at Kawashkagama Lake were noted by Aroland First Nation, although a specific species was not identified. • Aroland First Nation have noted observations of population decline of Brook Trout over the last 5 years, with one participant noting that they are not able to catch the same volume of fish as they used to in the past. • Another community member from Aroland First Nation noted that they had previously fished Brook Trout in this river all their life and now were not able to catch any, stating the following: – "Well, my concern is here [at the Albany River]. This is the concern I have because of the trout population. Because there's something happening with the Brook Trout on the Albany River. They're not there anymore. There should be 3, 4, 5-pound Brook Trout in there. This is what we're trying to figure out. What's going on? Because I've seen a decline in the population. And some of, like, you know, my nephews, they're starting to see that too because I'm bringing that up to them. Where are these trout? We've been fishing that place all our lives and we know where they are, where they're supposed to be but they're not there." (Shared Value Solutions, 2024). • Weenusk First Nation noted observations related to a decline in fish populations noting, with two community members providing the following feedback: – "Walleye used to be plentiful. We used to fish every creek and we'd get something. I usually go fishing with a buddy. It's more fun, and I don't know how many we get, maybe 50 (…) you have to go early though, right after breakup, but you can (…) still get em' in there with gill nets." – "The number [of fish] has changed, and I think it's because the river system has changed as well (…) The river system has become shallower every year and it's hard for fish to be (…) in the waters where it's shallow."
• **Concerns related to Fish and Fish Habitat** • **Mitigation Measures**	• Aroland First Nation (Dillon, 2024b; Shared Value Solutions, 2024) • Fort Albany First Nation (Firelight Research Inc., 2024) • Marten Falls First Nation (2023b)	• Aroland First Nation and Marten Falls First Nation both noted concerns related to the contamination of fish, particularly Lake Sturgeon (Acipenser fulvescens; Oji-Cree translation, nameh). • Aroland First Nation noted generalized concerns relating to how increased traffic will result in overall impacts onto the natural and atmospheric environment. • Aroland First Nation noted overall generalized concerns about the impact of dust and vibrations at watercourse crossings where fishing activities take place, as many overnight camp / cabin sites are located in close proximity to the Painter and Anaconda Lake Road waterbody crossings. The community also noted overall concerns related to how watercourse crossings may impact fish spawning areas. Some specific areas of concern that were highlighted included areas of watercourse crossings over the Ogoki River, Dusey River, and Albany River. • Aroland First Nation noted concerns related to how increased access to the region may make it easier for people to access harvesting areas, putting additional pressure on wildlife populations, with one community member noting: "The first thing I thought about was the wilderness, the animals would be disturbed. If the road goes through there, they're travelling routes would be disrupted. And also, their feeding might be disrupted. As for the fish, I think if they build bridges and all that, it's easier access for humans to go harvest. To me, that would be very destructive for the wildlife and fishery." • Aroland First Nation highlighted the presence of Lake Sturgeon habitat within the Ogoki River and Ogoki Lake. The community also noted concerns associated with how the species might be impacted by new watercourse crossings, as well as increased public access resulting in additional pressures due to more people fishing in the area, noting that the species is sensitive to habitat disturbances. • One community member from Aroland First Nation noted the following regarding Lake Sturgeon: – "Interviewee: Quite a number of years we've been going up and down there. As far as I remember, that was the route my dad used to make. All our lives we've been going up and down that [Ogoki] river. So that was their livelihood back then, sturgeon. They would go there and hunt sturgeon and they would sell them right there on the spot. – Interviewer: To who? – Interviewee: To planes that come in and they'd buy the sturgeon right there. They would have live sturgeon tied up. And as soon as the plane lands, that's when they'd clean the sturgeon. Because you can't keep sturgeon that long. Like it spoils real fast, that sturgeon. So, you've got to clean it whenever you have ice. And it's pretty hard to get ice up there. Yes, and they used to have ice houses. They used to have ice houses where they'd keep their fish, meat, whatever. Mostly the tourists would keep their fish there. Like before they'd come home, they'd pick it up and take it. And that's the only refrigeration they had was those ice houses."

Topic	Indigenous Community	Details
		• Another community member from Aroland First Nation noted the following regarding the importance of Ogoki Lake and the associated river system in supporting fish populations – highlighting its importance for Lake Sturgeon. – "They shouldn't bother [Ogoki Lake] and the river system then. To me, anyways. There's a lot of nature there, and fishing and spawning. Especially sturgeon: that's their spawning route to Amy Falls and up." • Aroland First Nation provided the following suggestions relating to Project mitigation measures which may apply to fish and fish habitat: – Follow provincial guidelines regarding barriers and containment systems at all bridge construction sites to prevent materials from entering the water. – Follow Fisheries and Oceans Canada's and Ontario's Species at Risk Stewardship Program guidelines regarding activity timing windows, sediment and erosion control, and stormwater management at all water crossings and where bridges are being constructed or upgraded. This is particularly important where spawning beds and Lake Sturgeon are known to reside (for example, the Ogoki River crossings). • Marten Falls First Nation noted concerns related to fish habitat and spawning areas including increased pollution in the waterways, an influx of overfishing, and the impacts of logging. • Marten Falls First Nation also noted suggestions for mitigation measures to offset these concerns including erecting physical barriers, building the road farther away from habitat and spawning sites, adequate signage for no fishing areas, increasing Ministry of Natural Resources presence, dust suppression, prohibiting logging near spawning areas, and additional monitoring of waterways and fish habitat. • Fort Albany First Nation noted generalized concerns including: – Concerns about how the Project may result in impacts onto fish habitat, fish contamination, and the community's trust in the safety of consuming fish and practicing subsistence fishing activities. – Concerns relating to how linear disturbances / building road crossings may impact fish habitat due to the introduction of barriers to natural watershed flow impeding fish movement. – Generalized overall concerns relating to the prediction of potential long-term / slowly evolving effects on aquatic habitats. – Concerns relating to how the Project might result in impacts onto water flow,. Iin particular, relating to how the Project could act as an additional barrier to natural water flow. Fort Albany First Nation also highlights specific concerns related to how the Attawapiskat River, Albany River, Moose River, and Winisk River might be impacted as a result. • Weenusk First Nation noted concerns specific to: – Mercury levels in certain harvested fish within their traditional territory. – Changes to fish quantity as a result of Project-related impacts onto spawning / reproductive sites, habitat quality and availability, and changes to water quality. – Contamination and spills impacting water quality, and as a result – fish habitat and spawning / reproductive areas. – The potential for upriver impacts onto have downstream effects, depending on fish movement and migration. – The potential for impacts related to air quality as a result of fugitive dust from movement and operations of construction equipment and vehicles. – Impacts onto harvestable species within the community's traditional territory as a result of increased access.
• **Groundwater** • **Springs**	• Marten Falls First Nation (2020) • Aroland First Nation (Shared Value Solutions, 2024)	• Marten Falls First Nation noted that water was is life-giving to the land and all species of life. The Community noted that the Project study areas contain various forms of water, including groundwater (Oji-Cree translation, anamakamigwabo) and springs (Oji-Cree translation, mokijiwanibiik). Additionally, the Community noted that major water flows in the area were oriented towards the Attawapiskat and Albany Rivers, which flow to James Bay. Water flows to smaller rivers, streams, and peatlands were said to be more complicated (and could locally flow in almost any direction). • Aroland First Nation noted the presence and location of areas along Ogoki River where spring water is collected for drinking, highlighting the importance of these features within their traditional territory.
• **Groundwater** • **Springs**	• Aroland First Nation (Dillon, 2024b)	• Aroland First Nation noted concerns related to potential effects on springs which may have spiritual value.
• **Groundwater** • **Pollution** • **Runoff**	• Marten Falls First Nation (Appendix O)	• Pollution from construction, runoff from vehicle traffic, and potential collisions / spills and subsequent ecological disruption were identified by Marten Falls First Nation as key concerns.

Topic	Indigenous Community	Details
• **Groundwater** • **Western and Indigenous Knowledge Integration**	• Marten Falls First Nation (Appendix O)	• Marten Falls First Nation noted interest in the proposed Project including a combination of western science hydrology with Indigenous Knowledge.
• **Peatlands**	• Aroland First Nation (Dilon, 2024b)	• Aroland First Nation noted concerns related to the potential spread of invasive species. Some Aroland First Nation community members have expressed concerns related to impacts on berries due to herbicide use.
• **Peatlands**	• Marten Falls First Nation (2023b)	• Marten Falls First Nation provided information about existing peatlands distribution in areas between Albany River and Pahtegosing River. A community member noted that they used to travel from the Albany River south channel to the Pahtegosing River and that there was a large expanse of peatlands and felled trees in this area. • Additionally, the community noted the importance of vegetation (in other words, moss) as food source for caribous spotted along the northern sections of the proposed Community Access Road route(s), between the proposed route(s), and Marten Falls.
• **Peatlands** • **Traditional Use Plants**	• Marten Falls First Nation (Dillon, 2024a)	• Marten Falls First Nation noted the importance of some vegetation species for their community due to their traditional uses. One of these species is muskrat root, which can be found in swamp areas.
• **Peatlands**	• Fort Albany First Nation (2020)	• Fort Albany First Nation noted an overall importance of the muskeg (peatland) to their community and Indigenous Peoples throughout the region. The community highlighted this, by stating that the meaning of Omushkegowuk (the people of the muskeg), speaks to the central importance of the muskeg to the community's lives and well-being. • Fort Albany First Nation provided an outline of a number of concerns related to impacts on the muskeg (peatlands) in the Study Areas. The concerns highlighted by the community included drying, flooding, diversions, damming, disturbance, pollution, and / or destruction of muskeg environments. • Fort Albany First Nation highlighted the potential negative effects of removing muskeg habitats and mossy areas, including a reduction in the muskeg's important air and water filtering function, as well as its role as diet and habitat for small mammals and rodents.
• **Peatlands**	• Marten Falls First Nation (2023b)	• Marten Falls First Nation noted concerns related to how the construction of the road would safely traverse peatlands, particularly one that will support heavy trucks without rapidly sinking. • Additionally, Marten Falls First Nation provided concerns related to illegal dumping of waste in peatlands, and contamination related to potential spills or collisions that could introduce potential leaching into the water table. The community noted that illegal dumping of waste is already a problem with the Winter Access Road (such as people leaving behind drums, vehicles, and other materials). One community member noted the importance of the muskeg, highlighting that "the muskeg is just like our bodies, if we get sick, and then the whole body gets sick", referring to the interconnections between the muskeg and other components of the environment.
• **Peatlands**	• Neskantaga First Nation (Neskantaga First Nation, 2020)	• Neskantaga First Nation noted the overall importance of the consideration of peatlands. • The Environmental Assessment includes the definition of peatlands as valued component, as well as a full evaluation on peatlands, including the development of a peatlands-specific Local Study Area and Regional Study Area and peatlands-specific study.
• **Peatlands**	• Weenusk First Nation (MNP LPP, 2024a)	• Weenusk First Nation noted concerns about: – The removal of bogs and peatlands, as well as related effects specific to the reduction of carbon storage capability. – The potential for impacts related to air quality as a result of fugitive dust from movement and operations of construction equipment and vehicles. – Impacts on harvestable species within the community's traditional territory as a result of increased access.

8.1.2 Valued Components of Water

Valued components for each discipline are an element of the environment deemed important by Indigenous peoples, the public, stakeholders, or regulatory bodies. **Section 6.3** describes the valued components that were selected based on information provided by Regulators, through field studies, and incorporation of Indigenous Knowledge. These components can include physical, biological, cultural, or socio-economic aspects of the environment that might be impacted by a proposed project. The valued components, indicators, and why they were selected for the water disciplines are provided in **Table 8.1-2**.

Table 8.1-2: Valued Components of Water

Discipline	Valued Component	Indicators	Rationale for Selection	Measures of Change
• **Surface Water**	• Surface Water Quantity	• Changes in drainage patterns • Changes in flow • Changes in water levels • Changes in channel hydraulics • Changes in channel stability or erosion-sedimentation processes	• Importance for the protection of aquatic habitat • Importance for potable water supplies • Importance for areas of Indigenous cultural importance for consumption • Directly linked to surface water and sediment quality • Directly linked to groundwater quality and quantity and affects groundwater-surface water interactions	• Potential effects are measured quantitatively and / or qualitatively as a possible change in streamflows, water levels, cross-section hydraulics, erosion, and sedimentation processes in waterbodies, as well as overall drainage patterns within the study areas
• **Surface Water**	• Surface Water Quality	• Change in physical parameters of water • Change in chemical parameters of water	• Importance for the protection of aquatic habitat • Importance for potable water supplies • Importance for areas of Indigenous cultural importance for consumption • Directly linked to sediment quality • Directly linked to groundwater quality	• Potential effects are measured quantitatively and / or qualitatively as an increase to concentrations of suspended solids or chemical constituents in receiving waters within the study areas
• **Surface Water**	• Sediment Quality	• Change in physical and chemical characteristics of sediment	• Importance for the protection of aquatic habitat • Directly linked to surface water quality	• Potential effects are measured quantitatively and / or qualitatively as an increase to concentrations of suspended solids or chemical constituents in channel bed and bank sediments, including lakes and ponds and riverbed, sediments within the study areas
• **Fish and Fish Habitat**	• Lake Sturgeon	• Habitat quantity and quality • Distribution and connectivity • Survival and reproduction	• Species of conservation concern (designated as Special Concern under *Species at Risk Act* and *Endangered Species Act*) • Cultural importance and sustenance • Importance for the maintenance of biodiversity	• Changes to habitat suitability (for example, temperature, substrate, depth, flows) • Changes in habitat use or access to important habitats (for example, spawning, refugia, nursery areas)
• **Fish and Fish Habitat**	• Pickerel • Walleye	• Habitat quantity and quality • Distribution and connectivity • Survival and reproduction	• Cultural importance and local recreational / economic value and sustenance	• Changes to habitat suitability (for example, temperature, substrate, depth, flows) • Changes in habitat use or access to important habitats (for example, spawning, refugia, nursery areas)
• **Fish and Fish Habitat**	• Speckled Trout / Brook Trout	• Habitat quantity and quality • Distribution and connectivity • Survival and reproduction	• Cultural importance and local recreational / economic value and sustenance	• Changes to habitat suitability (for example, temperature, substrate, depth, flows) • Changes in habitat use or access to important habitats (for example, spawning, refugia, nursery areas)
• **Fish and Fish Habitat**	• Northern Pike	• Habitat quantity and quality • Distribution and connectivity • Survival and reproduction	• Cultural importance and local recreational / economic value and sustenance	• Changes to habitat suitability (for example, temperature, substrate, depth, flows) • Changes in habitat use or access to important habitats (for example, spawning, refugia, nursery areas)
• **Fish and Fish Habitat**	• Lake Whitefish	• Habitat quantity and quality • Distribution and connectivity • Survival and reproduction	• Cultural importance and local recreational / economic value and sustenance	• Changes to habitat suitability (for example, temperature, substrate, depth, flows) • Changes in habitat use or access to important habitats (for example, spawning, refugia, nursery areas)
• **Fish and Fish Habitat**	• Ling	• Habitat quantity and quality • Distribution and connectivity • Survival and reproduction	• Cultural importance and local recreational / economic value and sustenance	• Changes to habitat suitability (for example, temperature, substrate, depth, flows) • Changes in habitat use or access to important habitats (for example, spawning, refugia, nursery areas)

Discipline	Valued Component	Indicators	Rationale for Selection	Measures of Change
• **Groundwater and Geochemistry**	• Groundwater	• Groundwater Quality	• Importance for the protection of aquatic and terrestrial life • Importance for potable water supplies • Indigenous cultural importance for consumption	• Degradation of physical and chemical characteristics of groundwater
• **Groundwater and Geochemistry**	• Groundwater	• Groundwater Quantity	• Quantify effects on landowners, users, and ecosystems	• Changes to groundwater levels
• **Peatlands**	• Peatland Ecosystems	• Availability (decrease / increase of overall amount of peatland area) • Distribution (changes to the arrangement and connectivity of peatlands)	• Social / cultural importance • Available habitat for wildlife • Ecosystem and landscape level biodiversity	• Changes in availability (area in hectare) and distribution within the Local Study Area
• **Peatlands**	• Peatland Ecosystems	• Function and Composition (change in plant species composition or ecological function)	• Peatlands provide hydrologic and biogeochemical functions • Peatlands are sensitive to changes in climate, hydrology, and anthropogenic disturbance • Peatlands can affect subsurface water flow in response to hydrological changes (Devito et al., 1997)	• Qualitative assessment of changes to function and composition
• **Peatlands**	• Peatland Ecosystems	• Carbon Storage and Flux	• Northern peatlands represent a large portion of the Earth's total terrestrial carbon stores (Thompson and Waddington, 2008) • Peatland disturbance is a source of greenhouse gas emissions to the atmosphere (Nugent et al., 2018)	• Soil Organic Carbon storage change measured in tonnes • Carbon Dioxide Flux measured in tonnes by day and tonnes by growing season • Methane Flux measured in tonnes by day and tonnes by growing season

8.1.3 Spatial Boundaries of Water Disciplines

As part of the assessment of existing conditions for the Community Access Road, discipline-specific study areas were developed for the water disciplines to account for the potential impacts of the road. The study areas for the water disciplines are defined in **Table 8.1-3** and on **Figure 8.1-1** to **Figure 8.1-3**.

Table 8.1-3: Spatial Boundaries of Water Disciplines

Discipline(s)	Construction Disturbance Area	Local Study Area	Regional Study Area
• **Surface Water** • **Fish and Fish Habitat**	• Includes the Project footprint and 100-metre-wide right-of-way and associated infrastructure (such as, temporary construction access roads, work areas, worker camps, and pits, quarries, and temporary access roads) for each route alternative (such as, Alternative 1 and Alternative 4). • Area Size: 12,665 hectares	• Includes the Construction Disturbance Area and extends approximately 2.5 kilometres from the centreline of Alternative 1 and Alternative 4 (total 5-kilometre width). A 500-metre buffer has been applied to areas where the Construction Disturbance Area falls outside of the 2.5 kilometre from the centreline of Alternative 1 and Alternative 4. • Area Size: 72,500 hectares	• Includes the Construction Disturbance Area and three tertiary watersheds (Upper Albany – Makokibatan, Lower Ogoki, and Upper Albany – Muswabik) that are intersected by the centreline of Alternative 1 and Alternative 4. The Regional Study Area was extended to include areas where the Local Study Area falls outside of these tertiary watersheds. • Area Size: 2,546,430 hectares
• **Groundwater and Geochemistry**	• Includes the Project footprint and 100-metre-wide right-of-way and associated infrastructure (such as, temporary construction access roads, work areas, worker camps, and pits, quarries, and temporary access roads) for each route alternative (such as, Alternative 1 and Alternative 4). • Area Size: 12,665 hectares	• Includes the Construction Disturbance Area and extends approximately 1 kilometre from centreline of Alternative 1 and Alternative 4 and associated construction areas. • Area Size: 104,989 hectares	• Includes the Construction Disturbance Area and extends 2.5 kilometres from centreline of Alternative 1 and Alternative 4 and associated construction areas. • Area Size: 215,068 hectares
• **Peatlands**	• Includes the Project footprint and 100-metre-wide right-of-way and associated infrastructure (such as, temporary construction access roads, work areas, worker camps, and pits, quarries, and temporary access roads) for each route alternative (such as, Alternative 1 and Alternative 4). • Area Size: 12,665 hectares	• Includes the Construction Disturbance Area and extends 3 kilometres as a buffer on either side of the centreline of the Community Access Road route alternatives. • 500-metre buffer around areas of the associated infrastructure falling outside of the original Local Study Area defined in the Study Plan. • Area Size: 197,960 hectares	• Quaternary watersheds that overlap peatlands existing conditions Local Study Area. • Area Size: 1,118,154 hectares

Figure 8.1-1: Aquatics (Surface Water and Fish and Fish Habitat) Local Study Areas

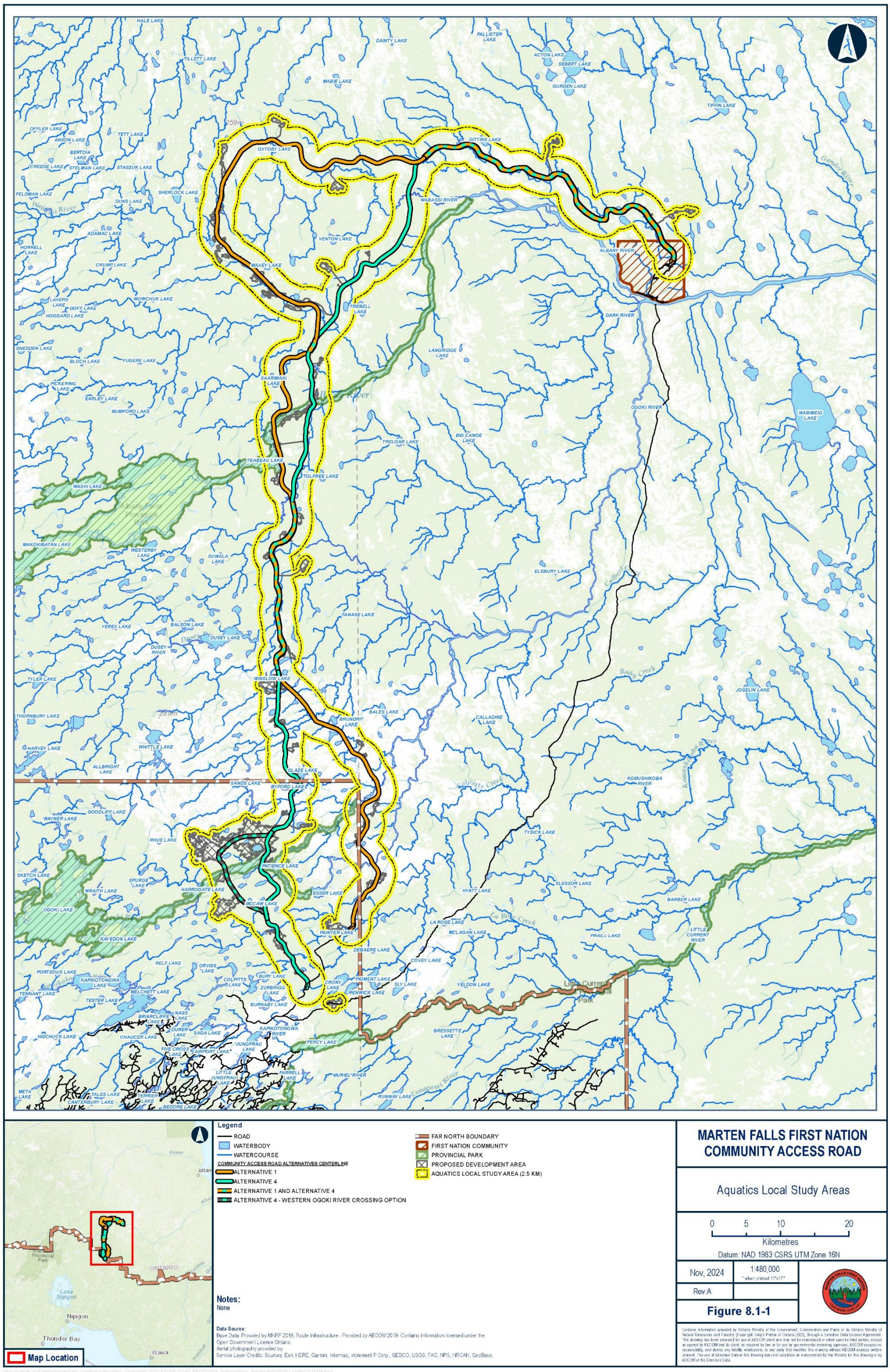


Figure 8.1-2: Groundwater Existing Conditions Local and Regional Study Areas

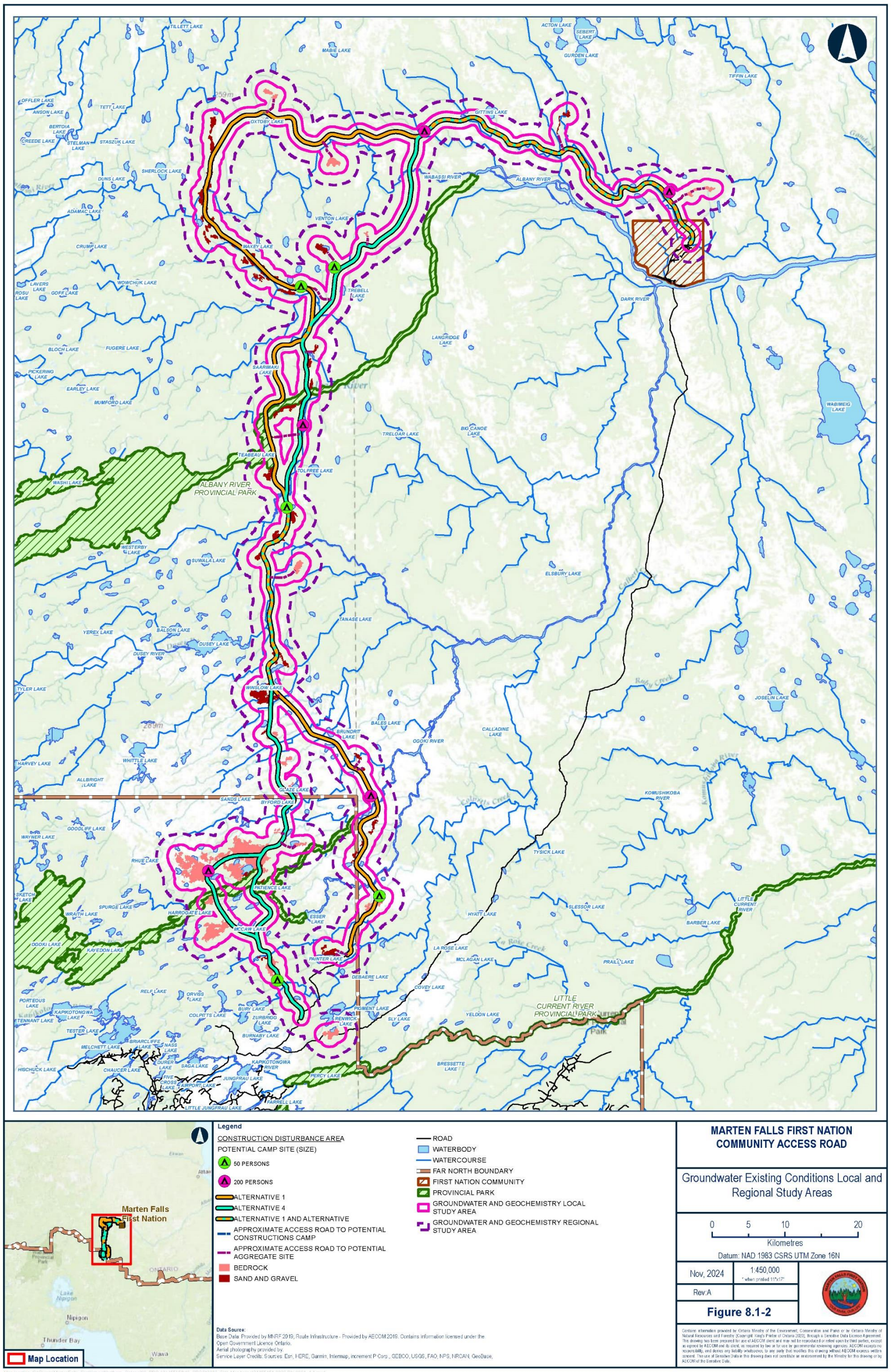
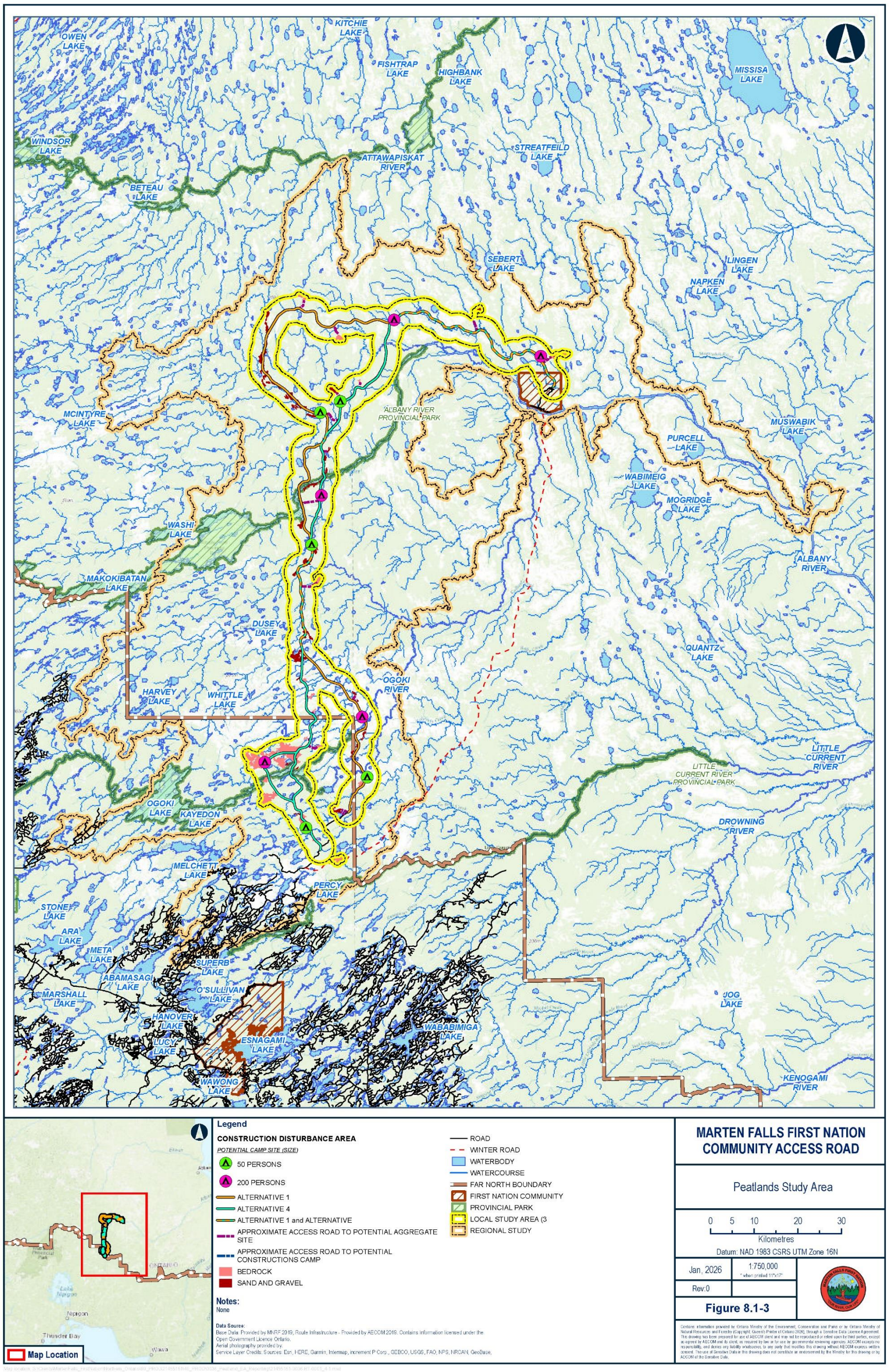


Figure 8.1-3: Peatlands Study Areas



8.1.4 General Existing Conditions

8.1.4.1 Watershed and River Systems

The Surface Water Regional Study Area is in the Upper Albany secondary watershed, which is part of the larger Hudson Bay primary watershed. It includes three smaller watersheds: 4GD-Upper Albany – Makokibatan, 4GE-Lower Ogoki, and 4GF-Upper Albany – Muswabik. These watersheds generally drain either east towards the Albany River or northeast towards Hudson Bay. They are under the area managed by the Ministry of Natural Resources. The main characteristics of each watershed is summarized as follows:

- **4GD – Upper Albany - Makokibatan watershed** drains into the main part of the Albany River, which then flows into James Bay. The Community Access Road crosses 46 watercourses, 2 lakes or ponds, and 50 undefined waterbodies in this watershed. This watershed covers an area of 22,739 square kilometres. The ground in this area is mostly made up of a mix of till, bedrock, and organic deposits. (Ministry of Northern Development and Mines, 2005). Over half of the watershed is covered by bogs, fens, and swamps. The elevation ranges from about 146 to 298 metres, with an average elevation of 256 metres, and the average slope is about 0.045 percent (Ministry of Natural Resources, 2025).
- **4GE – Lower Ogoki Tertiary watershed** drains from the Ogoki River, about 50 kilometres upstream from Ogoki Lake, to where it meets the Albany River, and then flows into James Bay. The Community Access Road crosses 36 watercourses, 4 lakes or ponds, and 23 undefined waterbodies in this watershed. This watershed covers an area of about 8,640 square kilometres. The ground here is mostly made up of a mix of till, bedrock, and organic deposits (Ministry of Northern Development and Mines, 2005). The watershed is mostly covered by bogs, fens, and swamps, making up more than 51 percent of the area. The elevation in the Lower Ogoki watershed ranges from about 146 to 298 metres, with an average elevation of 256 metres, and the average slope is around 0.045 percent (Ministry of Natural Resources, 2025).
- **4GF – Upper Albany – Muswabik Tertiary watershed** drains into the main part of the Albany River, which then flows into James Bay. The Community Access Road crosses three defined watercourses in this watershed. The Upper Albany – Muswabik watershed covers an area of 39,034 square kilometres. The ground here is mostly made up of organic deposits (Ministry of Northern Development and Mines, 2005). Over 84 percent of the watershed is covered by bogs, fens, and swamps. The elevation ranges from about 71 to 146 metres, and the average slope is around 0.041 percent (Ministry of Natural Resources, 2025).

8.1.4.2 Water Crossings

A total of 91 defined waterbody crossing locations (85 watercourses and 6 lakes) are within the Local Study Area (**Figure 8.1-4**):

- 40 waterbody crossings are on Alternative 1;
- 38 waterbody crossings are on Alternative 4; and
- 13 waterbody crossings overlap both Alternative 1 and 4.

There are three sections of the Alternative 1 and 4 that overlap. Therefore, Alternative 1 has 53 total waterbody crossings (40 on Alternative 1 alone, plus the 13 that overlap) and Alternative 4 has 51 total waterbody crossings (38 on Alternative 4 alone, plus the 13 that overlap).

Nine waterbody crossings are on named, large permanent rivers, including the Albany, Wabassi, Dusey, and Ogoki rivers.

The field investigations showed that the watercourses at the crossing locations generally had moderately to well-defined channels. These channels varied in size, with small watersheds having channels less than 1 to 9 metres wide, medium watersheds having channels 2.3 to 40 metres wide, and large watersheds having channels 43 to 210 metres wide. These channels cut across large areas of bog and fen terrain. They mostly had straight paths, gentle slopes (0.2 to 2.0 percent), and showed little evidence of erosion or sediment build-up. The beds and banks of these channels were generally stable, with only minor instances of bank erosion, sediment build-up, and changes in channel shape. The documented surface water characteristics for each of the defined waterbody crossings are provided in Attachment D of **Appendix F**.

Additionally, 73 unmapped water features without defined beds or banks were not considered waterbodies and were excluded from the crossing list. Details about these 73 features, including aerial photos and Light Detection and Ranging images, are in Attachment D of the Fish and Fish Habitat Technical Support Document (**Appendix G**).

In the Regional Study Area, there are 19,799 kilometres of mapped watercourses. The Upper Albany – Makokibatan watershed has the most watercourses, while the Upper Albany – Muswabik watershed has the fewest.

Figure 8.1-4: Defined Water Crossings

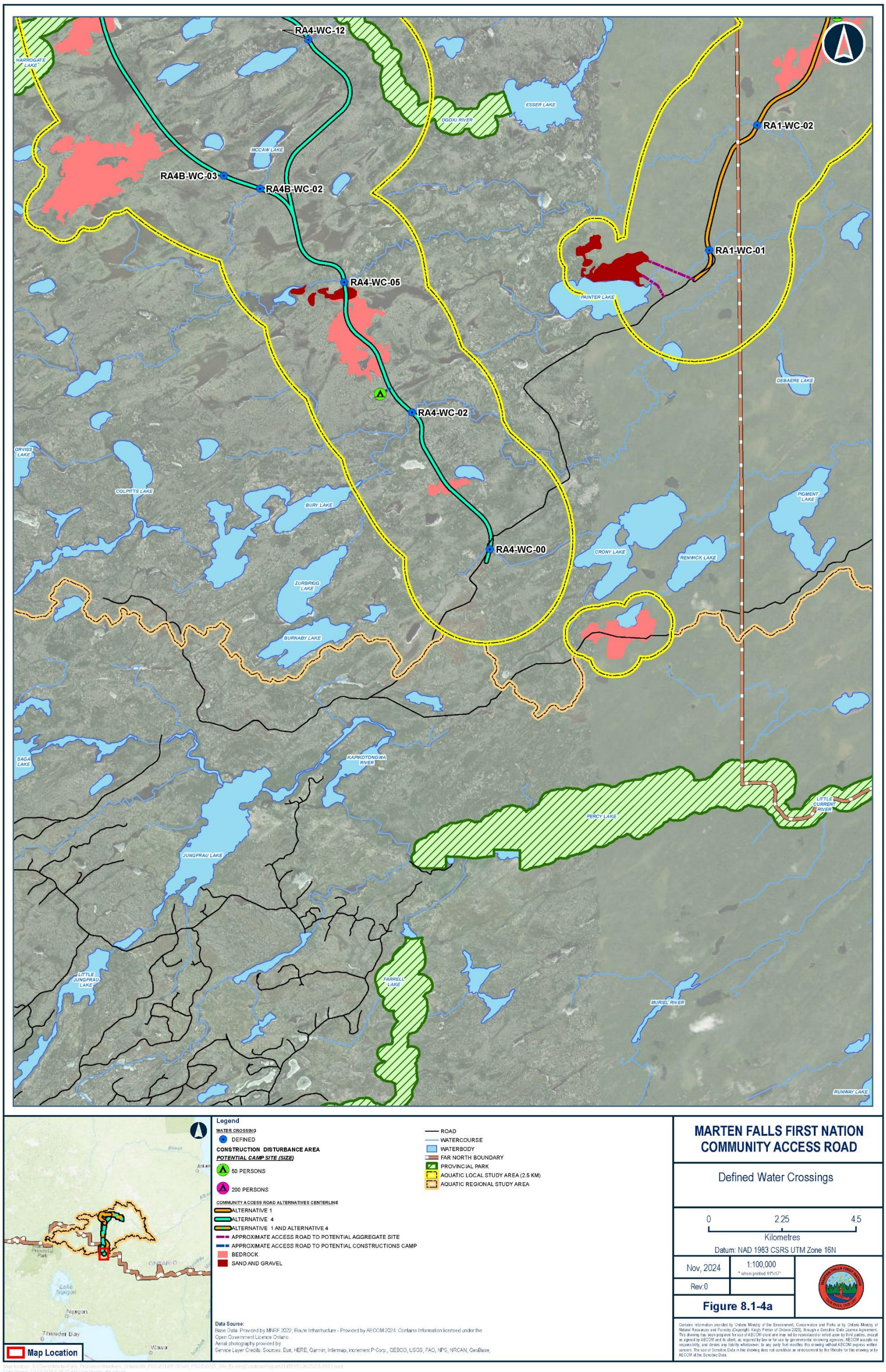


Figure 8.1-4b: Defined Water Crossings

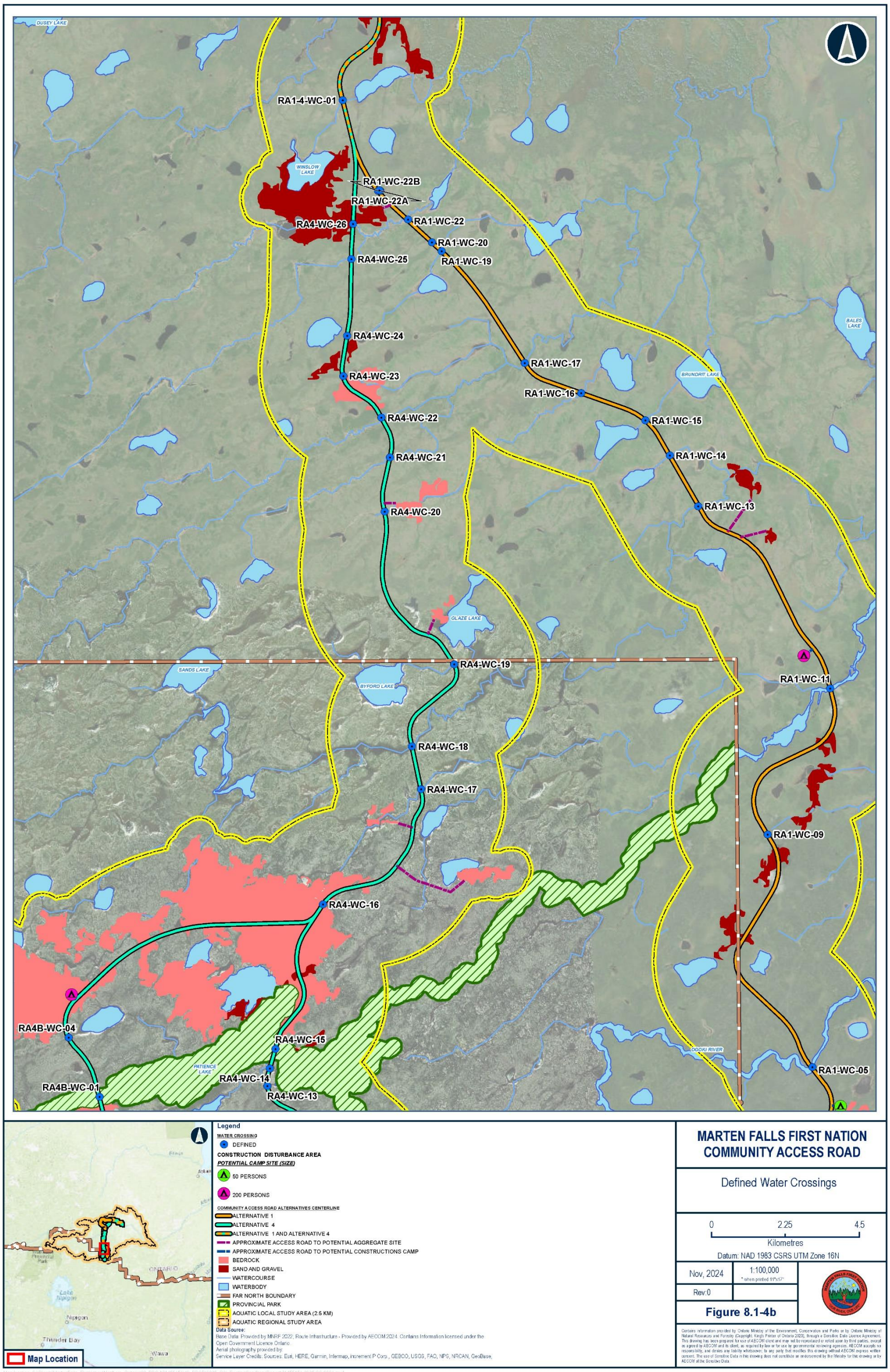


Figure 8.1-4c: Defined Water Crossings

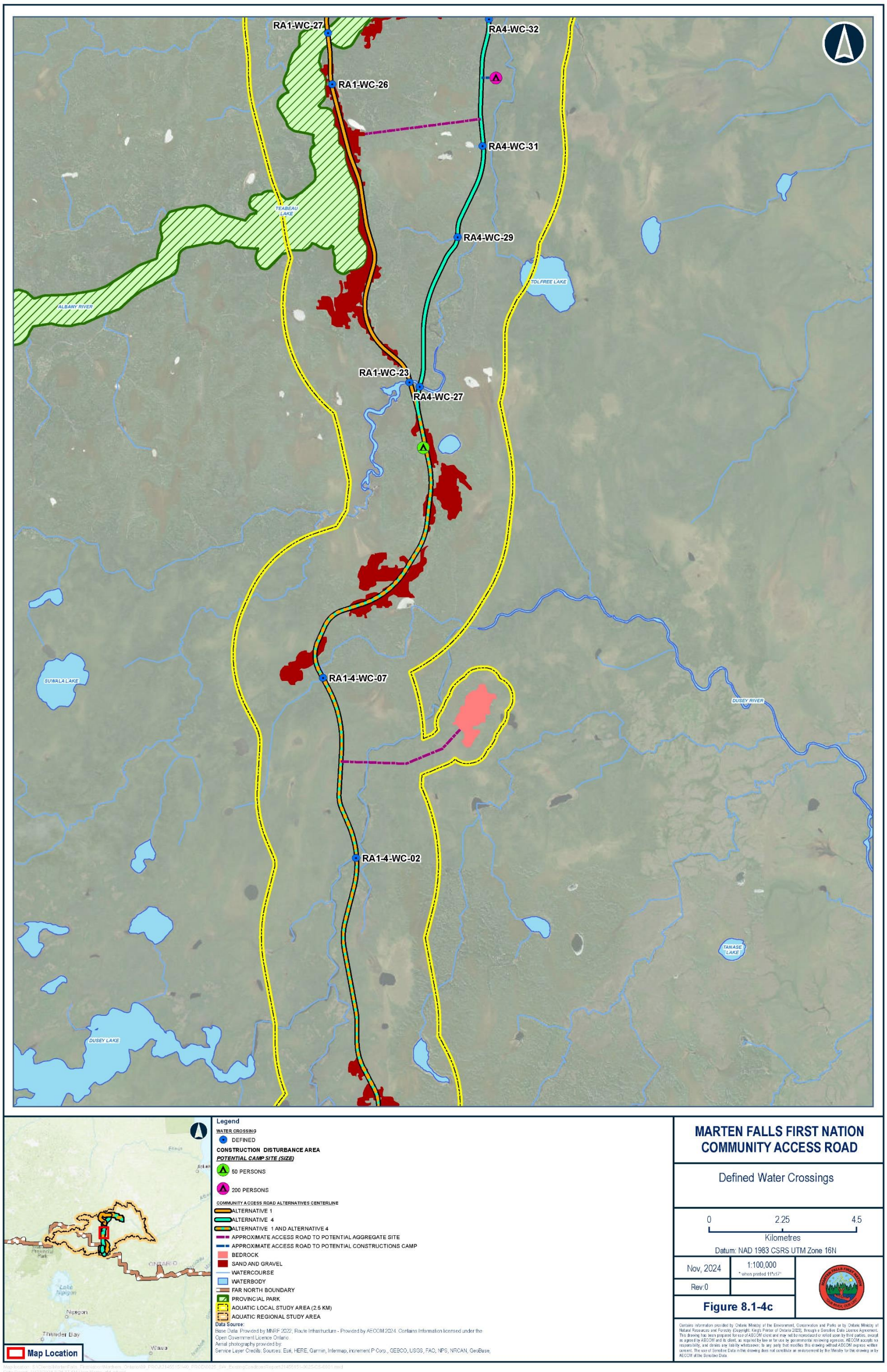


Figure 8.1-4d: Defined Water Crossings

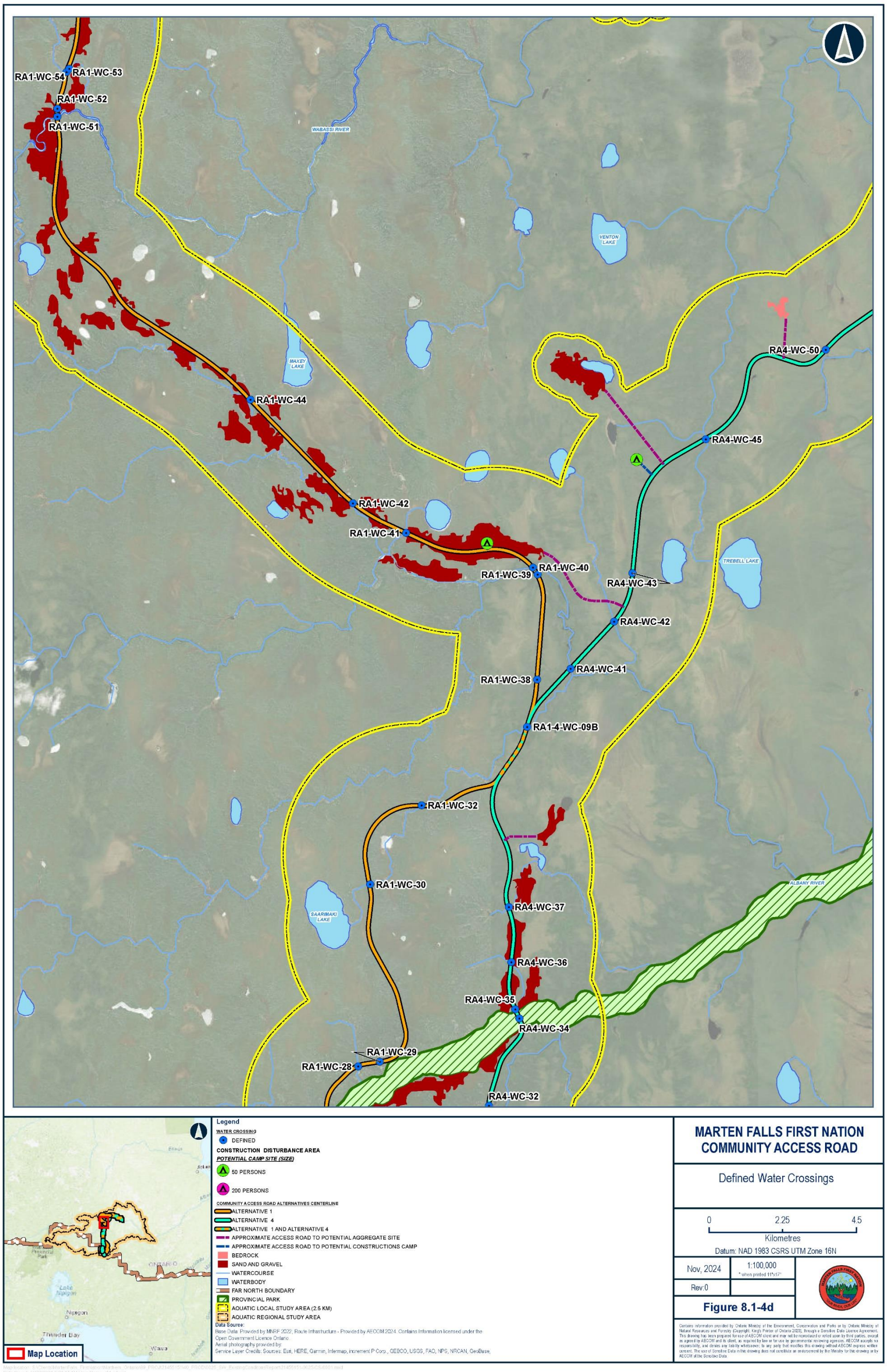


Figure 8.1-4e: Defined Water Crossings

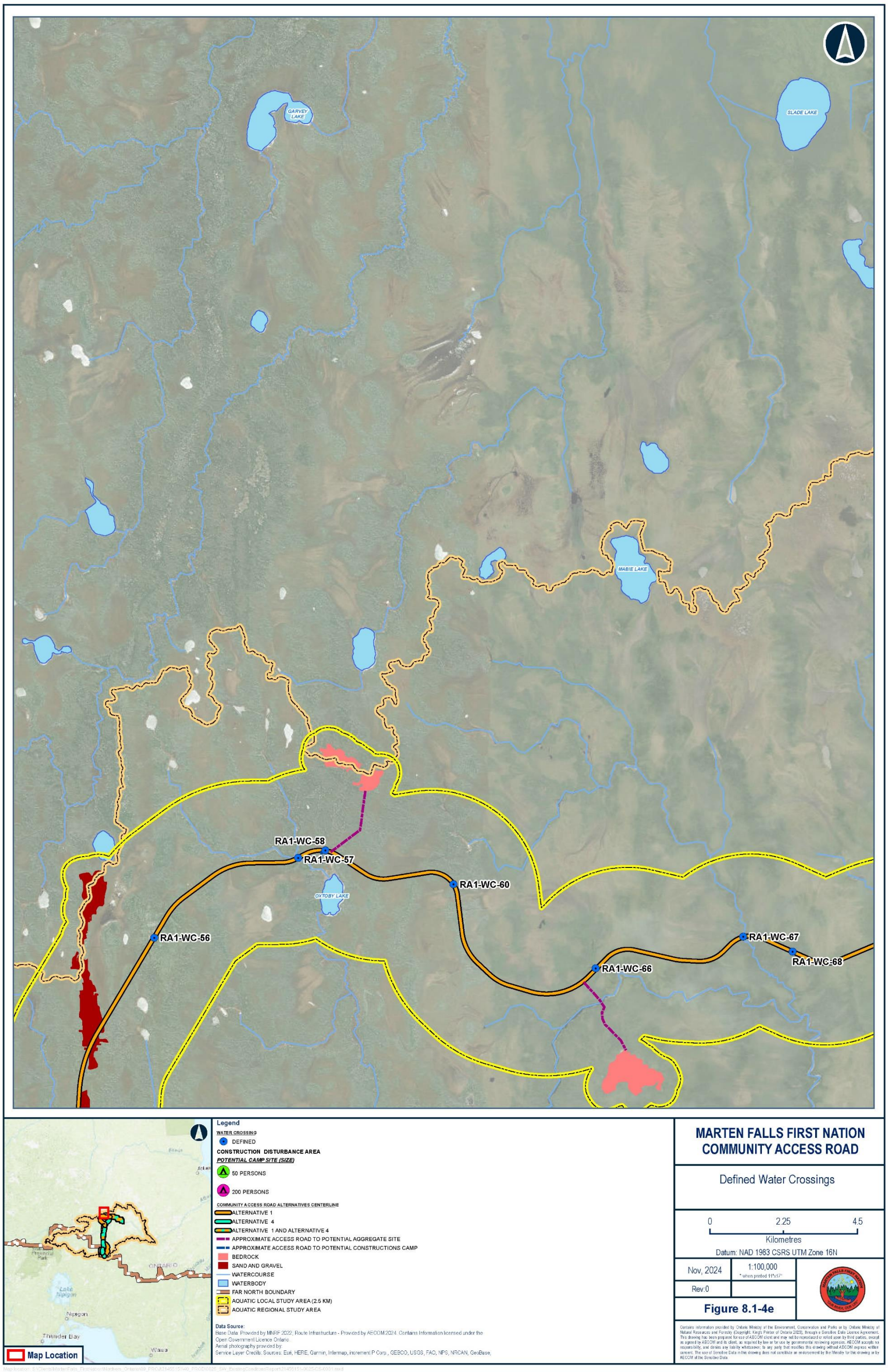


Figure 8.1-4f: Defined Water Crossings

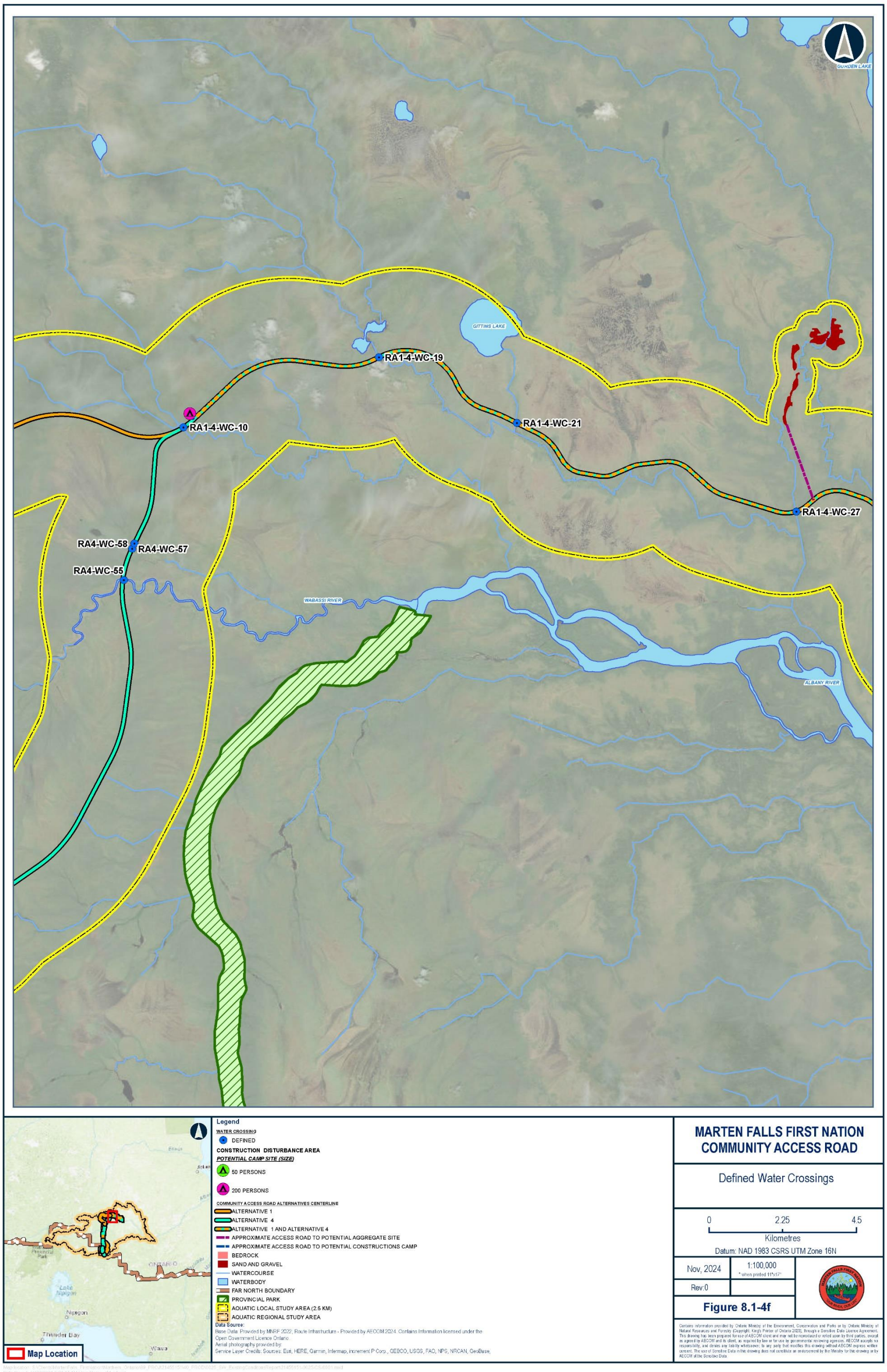
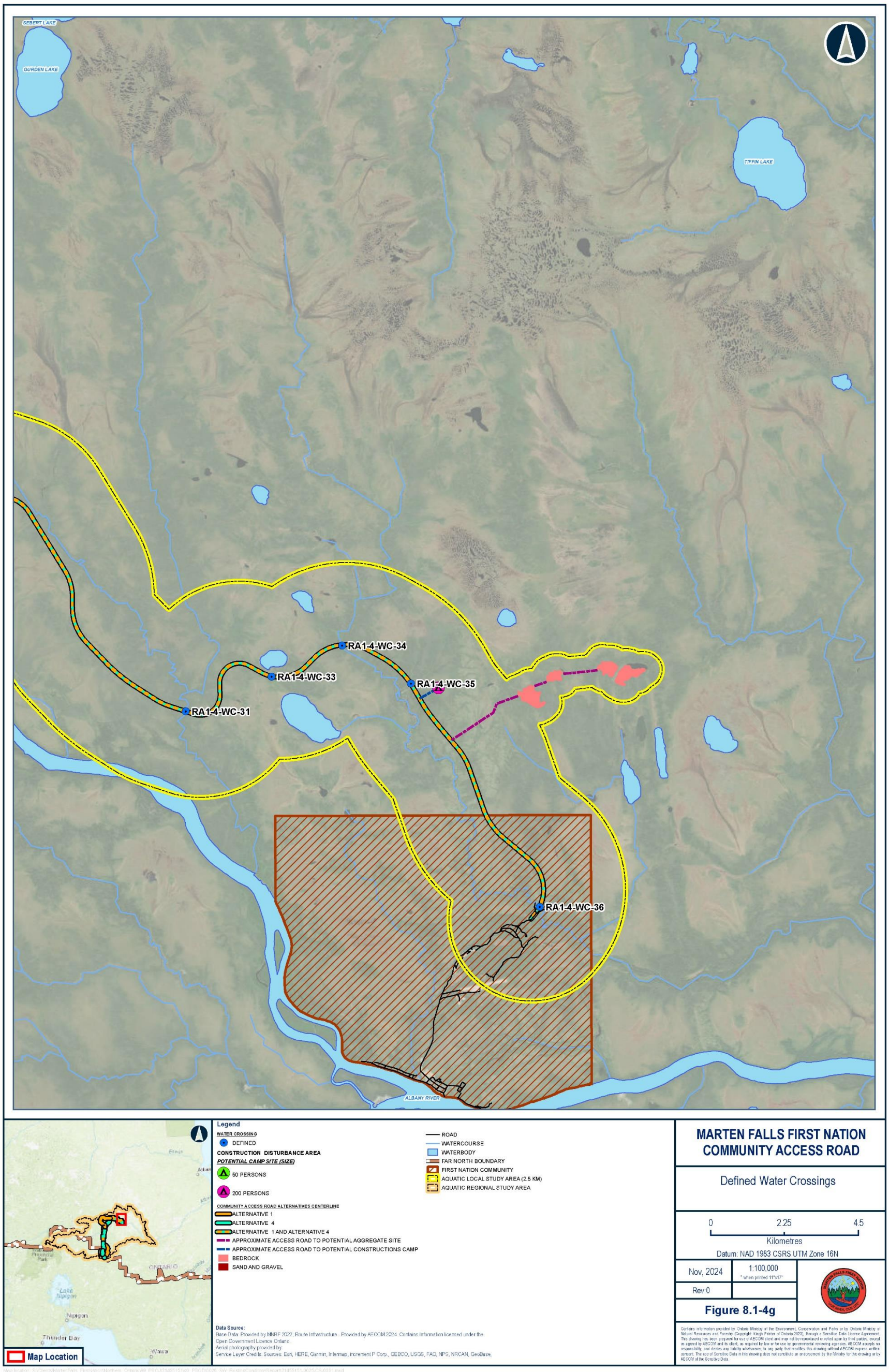


Figure 8.1-4g: Defined Water Crossings



8.1.5 Surface Water

The surface water existing environment was studied by reviewing existing information and conducting field investigations specifically for the Community Access Road. The desktop review included a review of aerial imagery and Light Detection and Ranging (where available) to develop the waterbody crossing list. Field investigations included flying over the area and conducting ground surveys at selected water crossings from 2019 to 2022.

The complete description of surface water existing conditions is documented in the Surface Water Technical Support Document (**Appendix F**).

8.1.5.1 Surface Water Use

8.1.5.1.1 Active Permits to Take Water

A review of the Ministry of the Environment, Conservation and Park's Permit to Take Water data catalogue was completed on January 31, 2023, to check for any active permits to take surface water or groundwater in the study area. The review found that there were no active permits in the Local and Regional Study Areas. It is important to note that communities in the Regional Study Area use surface water for domestic and recreational purposes.

8.1.5.1.2 Hydropower Generation

Based on a review of publicly available hydropower mapping (Ontario Ministry of Natural Resources and Forestry, 2001), Ontario Power Generation (2005, 2025a, 2025b) reports, and Water Survey of Canada Hydrometric datasets (Environment and Natural Resources, 2025), there are no known hydropower generating stations or active dams in the Local and Regional Study Areas.

8.1.5.2 Surface Water Quantity

Flows in the three tertiary watersheds within the Regional Study Area is mainly influenced by melting snow. Rainfall events have only a small impact on water flow. On average, these watersheds produce between 297 and 310 mm of surface water each year, which is about 43 percent to 46 percent of the total annual rainfall. The average annual rainfall and water flow for the Community Access Road were calculated using the Ontario Watershed Information Tool and are shown in **Table 8.1-4**.

Table 8.1-4: Mean Annual Precipitation, Surface Water Yields, and Runoff Coefficients for the Regional Study Area

Tertiary Watershed	Number of Watercourses Crossed by the Right-of-Way	Total Catchment Area (square kilometres) (Footnote a)	Mean Annual Precipitation (millimetres) (Footnote b)	Mean Annual Surface Water Yield (millimetres) (Footnote c)	Mean Annual Runoff Coefficient (Footnote d)
4GD-Upper Albany – Makokibatan	54	22,739	687	297	0.43
4GE-Lower Ogoki	46	8,640	698	297	0.43
4GF-Upper Albany – Muswabik	4	39,034	681	310	0.46

Footnotes: (a) Total catchment areas represent the total surface area of the tertiary watershed, and considers the following:
- Calculated as the sum of the catchment areas of the river systems crossed by the Community Access Road within the tertiary watershed; and
- Catchment areas for the Albany River include the diverted areas downstream from the Lake St. Joseph dam.

(b) Calculated as the area-weighted average of the mean annual precipitation for the catchments crossed by the Community Access Road.

(c) Calculated as the area-weighted average of the mean annual surface water yields in the catchments crossed by the Community Access Road. For each catchment, mean annual surface water yield in millimetres was calculated from the mean annual flow in cubic metres per second and the catchment area in square kilometres.

(d) Calculated as the ratio of mean annual surface water yield to mean annual precipitation.

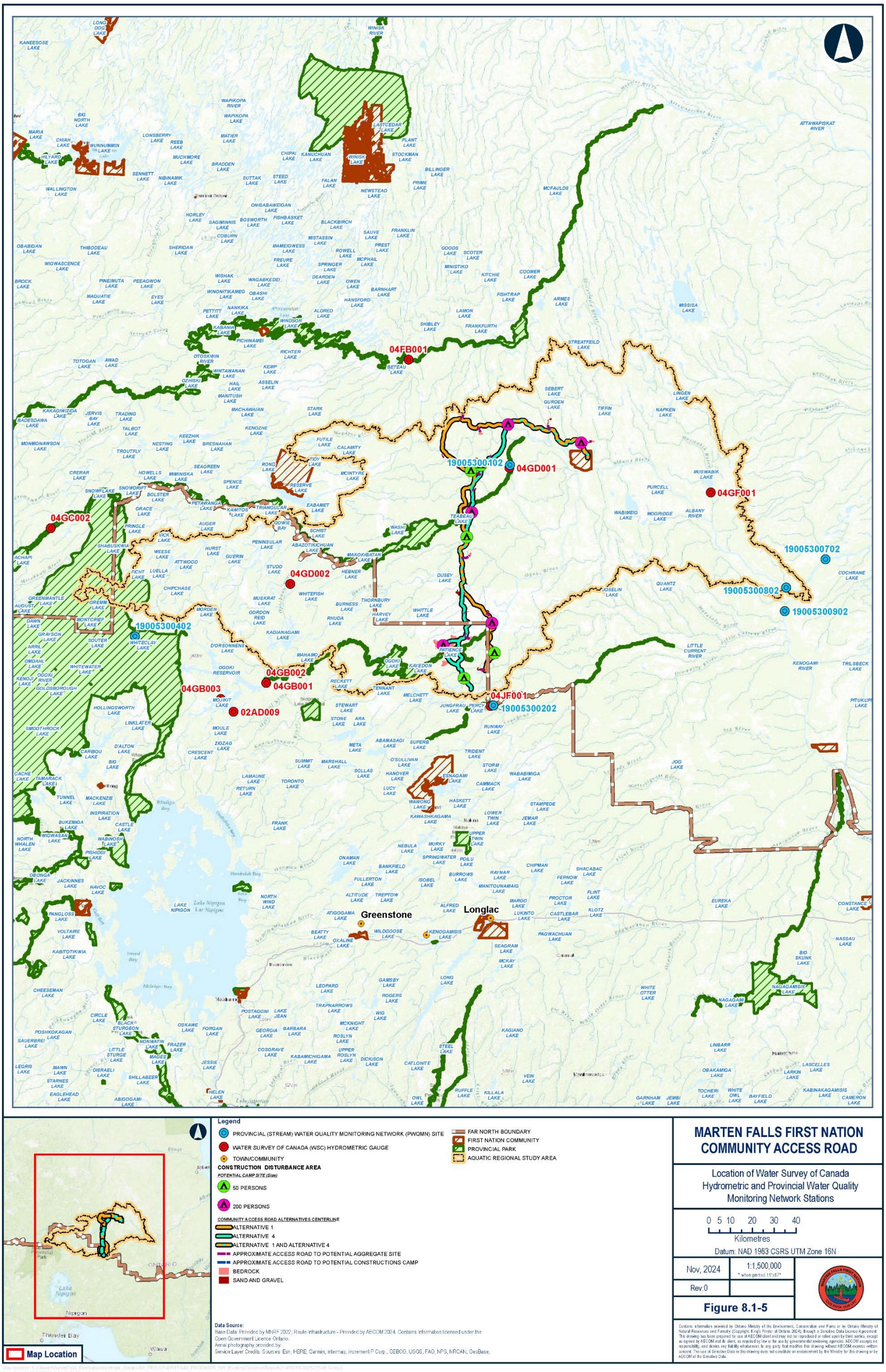
Flow records from the Water Survey of Canada stations were examined to determine the average yearly surface water yield, broken down by month, at locations where streamflow is measured. They also looked at the monthly changes in lake levels at stations where water levels are recorded. The results are summarized in **Table 8.1-5**.

A review of monthly streamflow and lake level results showed that average flows and water levels are highest in the spring because of snowmelt and lowest in the winter. The average seasonal water flow in the region ranges from 5 cubic metres per second in the winter (at Station 04GF001) to 527 cubic metres per second in the spring. (Stations 04FB001). Hydraulic station locations can be found on **Figure 8.1-5.**

Table 8.1-5: Mean Annual Surface Water Yields at Water Survey of Canada Stream Gauging Stations

Tertiary Watershed	Location in Relation to Existing Conditions Regional Study Area	Station ID	Station Name	Regulation Type	Catchment Area (square kilometres)	Mean Annual Surface Water Yield (millimetres)	Mean Annual Flow in Metres Cubed / Second (litres / second / square kilometres) (Footnote a)
4GD-Upper Albany – Makokibatan	Within Existing Conditions Regional Study Area Limits	04GD001	Albany River above Nottick Island	Regulated	32,400	219	225 (7)
4JF-Little Current	Outside of Existing Conditions Regional Study Area Limits	04JF001	Little Current River at Percy Lake	Natural	5,300	304	5 (10)
4FB-Upper Attawapiskat	Outside of Existing Conditions Regional Study Area Limits	04FB001	Attawapiskat River below Attawapiskat Lake	Natural	24,200	319	245 (10)
4GF-Upper Albany – Muswabik	Within Existing Conditions Regional Study Area Limits	04GF001	Muswabik River at Outlet Muswabik Lake	Natural	1,890	250	15 (8)
4GD-Upper Albany – Makokibatan	Within Existing Conditions Regional Study Area Limits	04GD002	Lake Opichuan River at Kellow Lake	Natural	1,170	384	14 (12)
4GB-Upper Ogoki	Outside of Existing Conditions Regional Study Area Limits	04GB002	Waboose Lake Reservoir at Waboose Dam	Regulated	Not applicable	Not applicable	Not applicable
4GB-Upper Ogoki	Outside of Existing Conditions Regional Study Area Limits	04GB001	Ogoki River at Waboose Falls Dam	Regulated	13,600	Not applicable	Not applicable
2AD-Upper Ogoki	Outside of Existing Conditions Regional Study Area Limits	02AD009	Ogoki River Diversion to Lake Nipigon	Regulated	Not applicable	Not applicable	Not applicable
4GB-Upper Ogoki	Outside of Existing Conditions Regional Study Area Limits	04GB003	Mojikit Lake Reservoir at Mojikit Lake	Regulated	Not applicable	Not applicable	Not applicable
4GC-Upper Albany – Misehkow	Outside of Existing Conditions Regional Study Area Limits	04GC002	Albany River below Achapi Lake	Regulated	16,300	115	60 (4)

Figure 8.1-5: Location of Water Survey of Canada Hydrometric and Provincial Water Quality Monitoring Network Stations



8.1.5.3 Surface Water and Sediment Quality

On May 23, 2023, a review of the 2019 Provincial (Stream) Water Quality Monitoring Network data (Ministry of the Environment, Conservation and Parks, 2019a) identified six water quality monitoring stations in and around the Regional Study Area. Additionally, water and sediment quality data from the Cliffs Chromite Project (Cliffs Ferroalloys, 2013a, 2013b) were used to further assess local and regional conditions. This included monitoring water quality at 43 waterbody crossings and sediment quality at 38 crossings.

The results showed that, in general, the lakes and streams at these crossings met most water and sediment quality guidelines. However, some locations had higher levels of iron, manganese, and methyl mercury in the water, and higher levels of total Kjeldahl nitrogen, chromium, iron, manganese, mercury, nickel, and phosphorus in the sediment, compared to Ontario Drinking Water Standards, Provincial Water Quality Objectives, and Canadian guidelines.

8.1.6 Fish and Fish Habitat

The fish and fish habitat assessment involved reviewing existing information, such as aerial images, and creating a list of waterbody crossings in the construction area. This review included data from previous studies, public consultations, and Indigenous Knowledge about waterbody types, fish species, habitat features (like spawning habitats), Species at Risk, and restricted activity periods. Community and Indigenous consultations provided additional information about traditional and current fishing grounds, spawning habitats, and migration routes.

Field investigations were conducted at various times from 2019 to 2022 at selected waterbody crossings and included aerial surveys, detailed fish and habitat surveys, rapid aerial assessments, fish sampling, and benthic invertebrate sampling to supplement the desktop assessment.

Through consultation with the Impact Assessment Agency of Canada, Fisheries and Oceans Canada, and the Ministry of Natural Resources, it was determined that site-specific fish and fish habitat data from a subset of waterbody crossings would provide sufficient information to characterize the fish and fish habitat existing environment. The following distribution of subset sites was agreed upon and targeted for the field investigations:

- A habitat assessment at a 50 percent subset of locations where the Construction Disturbance Area intersects with waterbodies with potential fish habitat;

- Fish community sampling at a 50 percent subset of locations where the Construction Disturbance Area intersects with waterbodies with potential fish habitat (typically where habitat assessment has been completed); and
- Benthic invertebrate sampling at a 25 percent subset of sites selected for habitat assessment.

The complete description of fish and fish habitat existing conditions is documented in the Fish and Fish Habitat Technical Support Document (**Appendix G**).

8.1.6.1 Fish Habitat Quantity and Quality

8.1.6.1.1 Alternative 1

Alternative 1 crosses 53 waterbodies (40 unique to Alternative 1 and 13 overlapping with Alternative 4). Fifty-two of these crossings are on streams or rivers, and one is on a lake or pond.

Field surveys observed various aquatic habitats, including flats, runs, pools, and impoundments. The substrates included organics, silt, sand, gravel, cobble, boulder, and bedrock. Fish cover types included depth / turbulence, large woody debris, aquatic vegetation, substrate, and overhanging vegetation. Beaver dams and debris piles were found at five crossings.

Spawning habitat for key fish species (Lake Sturgeon, Lake Whitefish, Brook Trout, Walleye, Northern Pike, and Burbot) were identified in the Albany and Ogoki rivers. Brook Trout, Burbot, Northern Pike, and Walleye spawning habitat were also found in the Dusey River. Additional spawning habitat for Brook Trout, Burbot, Northern Pike, and Walleye were identified in various unnamed watercourses and Gourlie Creek. Spawning habitats for Johnny Darter (Etheostoma nigrum; Oji-Cree translation, ashaawe) and Brook Stickleback (Culaea inconstans; Oji-Cree translation, ginooshench) were found at all waterbody crossings on Alternative 1.

The following water crossings were identified by Indigenous communities as significant along Alternative 1, and are summarized as follows:

- **Ogoki River at Crossing RA1-WC-05:** No barriers to fish movement were noted. The river bottom was largely boulders, with some cobbles, gravel, and sand, with some aquatic plant life. This section has the potential to support a variety of small-bodied and large-bodied fish. Rearing and spawning potential is high, and fish such as Brook Trout, Northern Pike, Walleye, Lake Sturgeon, and Lake Whitefish have all been documented in the Ogoki River, in addition to small-

bodied forage fish species such as Lake Chub (Ministry of Natural Resources and Forestry, 2023a; Government of Ontario, 2015; Golder, 2013a). Fish sampling was not conducted at this crossing but the fish community in the Ogoki River is well documented.

- **Ogoki River at Crossing RA1-WC-11:** No barriers to fish movement were noted. The river bottom was largely cobbled, silt, and organics. This section has moderate to high overwintering, spawning, and rearing potential for small and large-bodied fish. As with the river crossing above (RA1-WC-05), fish such as Brook Trout, Northern Pike, Walleye, Lake Sturgeon, and Lake Whitefish have all been documented in the Ogoki River, in addition to small-bodied forage fish species such as Lake Chub (Couesius plumbeus; Oji-Cree translation, ginooshench) (Ministry of Natural Resources and Forestry, 2023a; Government of Ontario, 2015; Golder, 2013a). Fishing sampling done in 2022 found young Northern Pike, Northern Redbelly Dace (Chrosomus eos; Oji-Cree translation, ozaawashko ginooshench), Northern Pearl Dace (Margariscus margarita; Oji-Cree translation, shaagawaako ginooshench), Burbot, and mottle sculpin (Cottus bairdii; Oji-Cree translation, ashaawew ginooshe).
- **Albany River at Crossing RA1-WC-27:** No barriers to fish movement were noted. The river bottom was largely boulder, cobble, and bedrock. Spawning and rearing habitat potential was moderate to high for small and large-bodied fish species, including Lake Sturgeon, which spawn over rocky substrates in fast flowing rapids. A Giant Floater (Pyganodon grandis), a native freshwater mussel commonly found in Ontario rivers with a wide distribution across Canada, was found at the crossing. Fish including Brook Trout, Northern Pike, Walleye, Lake Sturgeon, and Lake Whitefish are well documented in the Albany River, as well as several small-bodied forage fish species such as Lake Chub and Brook Stickleback (Ministry of Natural Resources and Forestry, 2023a; Government of Ontario, 2015; Golder, 2013a). Speckled Trout and Lake Sturgeon have been confirmed within 1 kilometre of this crossing, and Pickerel (such as, Walleye) and Northern Pike are also known in the area (Marten Falls First Nation, 2021a). Brook Trout are known to spawn above Kagiami Falls, and Lake Sturgeon spawning below Kagai Falls. As the fish community in the Albany River is already well documented, fishing effort for the Project was minimal and no fish sampling was conducted at this location. Refer to **Table 8.1-6** for sampling efforts done on the Albany River at crossing location RA4-WC-34.

Detailed information about fish habitat characteristics in water crossings for Alternative 1 can be found in **Table 8.1-6**. Water crossing locations can be found on **Figure 8.1-4**.

Table 8.1-6: Fish Habitat Characteristics in Waterbodies Crossed by Alternative 1 from Field Survey Results (2019 to 2022)

Waterbody Crossing ID	Waterbody Name	Mean Wetted Width (metres)	Mean Bankfull Width (metres)	Mean Water Depth (metres)	Fish Habitat Potential
RA1-4-WC-01	Unnamed	1.3	3	0.7	Habitat suitable for fish species adapted to waterbodies with fine substrates and abundant vegetation.
RA1-4-WC-02	Dusey River	34.7	44	1.3	Variety of habitat units and mixed substrates is suitable for a range of small and large-bodied fish species. Overwintering habitat present.
RA1-4-WC-07	Unnamed	6	Not applicable	1.5	Habitat present for fish species adapted to waterbodies with fine substrates and abundant vegetation.
RA1-4-WC-09B	Unnamed	3	3	3	Habitat present for fish species adapted to waterbodies with fine substrates and abundant vegetation.
RA1-4-WC-10	Unnamed	6	6	1.5	Habitat present for small-bodied fish species adapted to waterbodies with fine substrates.
RA1-4-WC-19	Unnamed	35	27	1.5	Habitat present for fish species adapted to waterbodies with fine substrates and abundant vegetation.
RA1-4-WC-21	Unnamed	5.5	6	1.2	Habitat present for fish species adapted to fine substrates and abundant vegetation.
RA1-4-WC-27	Unnamed	4	4	1	Habitat present for fish species adapted to waterbodies with fine substrates.
RA1-4-WC-31	Buffaloskin River	7	8	0.8	Suitable habitat present for fish adapted to fine substrates.
RA1-4-WC-33	Unnamed	5.2 / 2.0	5.7	0.6 / 0.7	Suitable habitat present for small-bodied fish adapted to fine substrates.
RA1-4-WC-35	Unnamed	2.7	3.2	0.7	Suitable habitat present for small-bodied fish. Overwintering habitat present.
RA1-4-WC-36	Unnamed	14.5	15.5	More than 2	Suitable habitat present for fish adapted to fine substrates. Overwintering habitat present.
RA1-4-WC-37	Unnamed	0.45	0.5	0.25	Habitat suitable for species adapted to fine substrates.
RA1-WC-01	Unnamed	4.8	5.5	0.5	Variety of habitat units and mixed substrates is suitable for a range of small and large-bodied fish species. Overwintering habitat present.
RA1-WC-02	Unnamed	8	8	1.3	Habitat suitable for a range of small and large-bodied fish due to depths and mixed substrates. Overwintering habitat present.
RA1-WC-05	Ogoki River	48	73	More than 1.5	Large and small-bodied fish historically documented. Habitat suitable for a range of fish due to depths and mixed substrates. Overwintering habitat present.
RA1-WC-09	Unnamed	2.1	2.4	2.6	Habitat suitable for small-bodied fish species.
RA1-WC-11	Ogoki River	100	110	2	Habitat suitable for a range of fish due to depths and mixed substrates. Large and small-bodied fish historically documented. Overwintering habitat present.
RA1-WC-13	Unnamed	9	9	Not applicable	Habitat suitable for small-bodied fish and Northern Pike.
RA1-WC-14	Unnamed	3	3.5	1.2	Habitat suitable for small-bodied fish species adapted to fine substrates and low dissolved oxygen.
RA1-WC-15	Unnamed	22	4	Not applicable	Habitat suitable for small-bodied fish and Northern Pike.
RA1-WC-16	Unnamed	50 / 70	6.5	1.7	Habitat suitable for fish species adapted to fine substrates and aquatic vegetation. Overwintering habitat present.
RA1-WC-17	Unnamed	9	10	0.9	Habitat present for small and large-bodied fish. Overwintering habitat present.
RA1-WC-19	Unnamed	20	2	1	Habitat is suitable for small-bodied fish adapted to fine substrates.
RA1-WC-19B	Unnamed	1.5	2	-	Suitable habitat may be present for small-bodied fish.
RA1-WC-20	Unnamed	2	2	Less than 1	Habitat suitable for small-bodied fish species adapted to organic substrates.
RA1-WC-22	Unnamed	50	17	1	Habitat suitable for small and large-bodied fish. Limited overwintering habitat.
RA1-WC-23	Unnamed	90	95	More than 2	Suitable habitat for fish species adapted to fine substrates and aquatic vegetation. Overwintering habitat present.
RA1-WC-25	Unnamed	Not applicable	Not applicable	Not applicable	Not a watercourse. No bed or banks present, no signs of bed scour. Unnamed drainage that provides a hydrological connection between two waterbodies. No fish habitat.
RA1-WC-26	Unnamed	1.25	2	0.2	Low habitat potential to for small-bodied fish.
RA1-WC-27	Albany River	180	200	More than 1	Large and small-bodied fish historically documented. Habitat suitable for a wide range of fish. Overwintering habitat present.
RA1-WC-28	Unnamed	2	2.5	0.3	Habitat suitable for small-bodied fish.
RA1-WC-30	Unnamed	40	3.3	0.8	Habitat suitable for both large and small-bodied fish species adapted to fine substrates and aquatic vegetation. Overwintering habitat present.

Waterbody Crossing ID	Waterbody Name	Mean Wetted Width (metres)	Mean Bankfull Width (metres)	Mean Water Depth (metres)	Fish Habitat Potential
RA1-WC-31	Unnamed	Not applicable	Not applicable	Not applicable	Not a watercourse. No bed or banks present, no signs of bed scour. Unnamed drainage that provides a hydrological connection to a watercourse. No fish habitat.
RA1-WC-32	Unnamed	90	6	1.2	Habitat suitable for both large and small-bodied fish species adapted to fine substrates and aquatic vegetation. Overwintering habitat present.
RA1-WC-33	Unnamed	Not applicable	Not applicable	Not applicable	Not a watercourse. No bed or banks present, no signs of bed scour. Unnamed drainage that provides a hydrological connection to a watercourse. No fish habitat.
RA1-WC-38	Unnamed	1.5	1.5	Less than 1	Habitat may be suitable for small-bodied fish species adapted to fine substrates. Isolated sections of standing water.
RA1-WC-39	Unnamed	2	3	Less than 1	Habitat may be suitable for small-bodied fish species adapted to fine substrates. Isolated sections of standing water.
RA1-WC-40	Gourlie Creek	14	17	More than 1	The deep, wide, flat habitat likely provides overwintering and spawning habitat.
RA1-WC-41	Unnamed	4	4.3	1.1	Habitat suitable for both large and small-bodied fish species adapted to fine substrates and aquatic vegetation. Overwintering habitat present.
RA1-WC-51	Wabassi River	60	65	More than 1.5	Habitat suitable for both large and small-bodied fish. Overwintering habitat present.
RA1-WC-52	Unnamed	1	40	0.1	Habitat suitable for fish species adapted to fine / organic substrates and aquatic vegetation.
RA1-WC-53	Unnamed	68	68	0.8	Habitat may be present for small-bodied fish species adapted to fine substrates and Northern Pike.
RA1-WC-54	Unnamed	40	40	Less than 1	Habitat may be present for small-bodied fish species adapted to fine substrates and Northern Pike.
RA1-WC-56	Unnamed	50	0.5	Less than 0.5	Habitat may be present for small-bodied fish species adapted to fine substrates and Northern Pike.
RA1-WC-57	Unnamed	13.6 / 22	31.6	More than 1.2 / More than 2	Habitat suitable for fish species adapted to fine substrates and aquatic vegetation.
RA1-WC-66	Unnamed	9 / 105	17	0.8	Habitat suitable for fish species adapted to fine substrates and aquatic vegetation. Overwintering habitat present for small-bodied fish.
RA1-WC-67	Unnamed	18	22	1.1	Habitat suitable for species adapted to fine substrates. Overwintering habitat present.

8.1.6.1.2 Alternative 4

Alternative 4 crosses 51 waterbodies (38 unique to Alternative 4 and 13 overlapping with Alternative 1). Forty-six of these crossings are on streams or rivers, and five are on lakes or ponds.

Field surveys observed various aquatic habitats, including flats, runs, riffles, pools, and impoundments. The substrates included organics, silt, sand, gravel, cobble, boulder, and bedrock. Fish cover types included depth / turbulence, large woody debris, aquatic vegetation, substrate, undercut banks, and overhanging vegetation. Beaver dams were found at ten crossings.

Spawning habitats for key fish species (Lake Sturgeon, Lake Whitefish, Brook Trout, Walleye, Northern Pike, and Burbot) were identified in Patience Lake, the Albany River, and the Ogoki River. Brook Trout, Northern Pike, Burbot, and Walleye spawning habitats were also found in the Dusey River. Additional spawning habitat for Brook Trout, Burbot, Northern Pike, and Walleye were identified in the Wabassi River and various unnamed watercourses. Spawning habitats for Johnny Darter and Brook Stickleback were found at all waterbody crossings on Alternative 4.

The following water crossings were identified by Indigenous communities as significant along Alternative 4, and are summarized as follows:

- **Ogoki River at Crossing RA4B-WC-01:** At this crossing, the river bottom was largely cobble, boulder, gravel, sand, and silt, and there were aquatic plants to provide cover for fish. This section has high overwintering potential for all fish species. The Ogoki River is known to be home to Brook Trout, Northern Pike, Walleye, Lake Sturgeon, and Lake Whitefish, as well as several small-bodied forage fish species such as Lake Chub (Ministry of Natural Resources and Forestry, 2023a; Government of Ontario, 2015; Golder, 2013a). Fish sampling was not conducted at this crossing because it would have fallen during a restricted activity window, however, it is assumed that the populations are similar to those found at Ogoki River at Crossing RA1-WC-11 (above).
- **Albany River at Crossing RA4-WC-34:** The river bottom here is largely boulders, sand, cobble, and gravel. There were no barriers to fish movement. This section has high overwintering potential for all fish species. Spawning and rearing habitat potential was moderate to high for small and large-bodied fish species, including Lake Sturgeon. The Albany River is known to house fish such as Brook Trout, Northern Pike, Walleye, Lake Sturgeon, and Lake Whitefish, as well as several small-bodied forage fish such as Lake Chub and Brook

Stickleback (Ministry of Natural Resources and Forestry, 2023a; Government of Ontario, 2015; Golder, 2013a). Fish sampling in 2021 involved setting minnow traps; no fish were captured.

- **Gourlie Creek at Crossing RA4-WC-41:** Gourlie Creek is also known as Onagwabiihkan'iih' Ziibih, or Evening Hunting River. Crossing RA4-WC-41 has no barriers to fish movement. The creek bed was largely sand and silt. This section has high overwintering potential for all species. A netting site was noted approximately 680 metres from this crossing (Marten Falls First Nation, 2019). Minnow traps were set in 2022 as part of the fish study and found two Trout-perch (Percopsis omiscomaycus; Oji-Cree translation, Namegosi ashaawench) and one Johnny Darter.

Detailed information about fish habitat characteristics in water crossings for Alternative 4 can be found in **Table 8.1-7**.

Table 8.1-7: Fish Habitat Characteristics in Waterbodies Crossed by Alternative 4 from Field Survey Results (2019 to 2022)

Waterbody Crossing ID	Waterbody Name	Mean Wetted Width (metres)	Mean Bankfull Width (metres)	Mean Water Depth (metres)	Fish Habitat Potential
RA1-4-WC-01	Unnamed	1.3	3	0.7	Habitat suitable for fish species adapted to waterbodies with fine substrates and abundant vegetation.
RA1-4-WC-02	Dusey River	34.7	44	1.3	Variety of habitat units and mixed substrates is suitable for a range of small and large-bodied fish species. Overwintering habitat present.
RA1-4-WC-07	Unnamed	6	Not applicable	1.5	Habitat present for fish species adapted to waterbodies with fine substrates and abundant vegetation.
RA1-4-WC-09B	Unnamed	3	3	3	Habitat present for fish species adapted to waterbodies with fine substrates and abundant vegetation.
RA1-4-WC-10	Unnamed	6	6	1.5	Habitat present for small-bodied fish species adapted to waterbodies with fine substrates.
RA1-4-WC-19	Unnamed	35	27	1.5	Habitat present for fish species adapted to waterbodies with fine substrates and abundant vegetation.
RA1-4-WC-21	Unnamed	5.5	6	1.2	Habitat present for fish species adapted to fine substrates and abundant vegetation.
RA1-4-WC-27	Unnamed	4	4	1	Habitat present for fish species adapted to waterbodies with fine substrates.
RA1-4-WC-31	Buffaloskin River	7	8	0.8	Suitable habitat present for fish adapted to fine substrates.
RA1-4-WC-33	Unnamed	5.2 / 2.0	5.7	0.6 / 0.7	Suitable habitat present for small-bodied fish adapted to fine substrates.
RA1-4-WC-35	Unnamed	2.7	3.2	0.7	Suitable habitat present for small-bodied fish. Overwintering habitat present.
RA1-4-WC-36	Unnamed	14.5	15.5	More than 2	Suitable habitat present for fish adapted to fine substrates. Overwintering habitat present.
RA1-4-WC-37	Unnamed	0.5	0.5	0.3	No fish captured; habitat suitable for species adapted to fine substrates.
RA4-WC-00	Unnamed	3.5	4	0.8	Habitat suitable for fish species adapted to fine substrates and aquatic vegetation.
RA4B-WC-01	Ogoki River	80	110	More than 2	Habitat suitable for a range of fish due to depths and mixed substrates. Large and small-bodied fish historically documented. Overwintering habitat present.
RA4B-WC-02	Unnamed	2.2	2.4	0.6	Habitat suitable for fish species adapted to organic substrates and aquatic vegetation.
RA4B-WC-03	Unnamed	Less than 5	Not applicable	Not applicable	Poorly defined channel with sections of ponded water that flows into McCaw Lake. Habitat may be present for small-bodied fish species.
RA4B-WC-04	Unnamed	Less than 5	Not applicable	Not applicable	Poorly defined channel with sections of ponded water that flows into an unnamed lake. Habitat may be present for small-bodied fish species.
RA4-WC-02	Colpitts Creek	12	13	1	Habitat suitable for fish species adapted to fine substrates and aquatic vegetation. Overwintering habitat present.
RA4-WC-05	Unnamed	10	11	1.3	Habitat suitable for fish species adapted to fine substrates and aquatic vegetation. Overwintering habitat present.
RA4-WC-06	Unnamed	Not applicable	Not applicable	Not applicable	Not watercourses. No bed or banks present, no signs of bed scour. Six drainage pathways in a wetland complex with multiple flow paths throughout. No fish habitat.
RA4-WC-07	Unnamed	Not applicable	Not applicable	Not applicable	Not watercourses. No bed or banks present, no signs of bed scour. Six drainage pathways in a wetland complex with multiple flow paths throughout. No fish habitat.
RA4-WC-08	Unnamed	Not applicable	Not applicable	Not applicable	Not watercourses. No bed or banks present, no signs of bed scour. Six drainage pathways in a wetland complex with multiple flow paths throughout. No fish habitat.
RA4-WC-09	Unnamed	Not applicable	Not applicable	Not applicable	Not watercourses. No bed or banks present, no signs of bed scour. Six drainage pathways in a wetland complex with multiple flow paths throughout. No fish habitat.
RA4-WC-10	Unnamed	Not applicable	Not applicable	Not applicable	Not watercourses. No bed or banks present, no signs of bed scour. Six drainage pathways in a wetland complex with multiple flow paths throughout. No fish habitat.
RA4-WC-11	Unnamed	Not applicable	Not applicable	Not applicable	Not watercourses. No bed or banks present, no signs of bed scour. Six drainage pathways in a wetland complex with multiple flow paths throughout. No fish habitat.
RA4-WC-12	Unnamed	8.4	10	0.6	Habitat suitable for fish species adapted to fine substrates and aquatic vegetation.
RA4-WC-17	Unnamed	80	8	More than 1.5	Habitat suitable for fish species adapted to organic / fine substrates and aquatic vegetation.
RA4-WC-18	Rock Beaver Creek	18.2	18.2	More than 2	Habitat suitable for a range of small and large-bodied fish species. Overwintering habitat present.
RA4-WC-19	Unnamed	2.8	2.8	1.1	Habitat present for fish species adapted to fine substrates and aquatic vegetation.
RA4-WC-21	Unnamed	12.5	8	More than 1.5	Habitat suitable for fish species adapted to organic / fine substrates and aquatic vegetation.
RA4-WC-22	Unnamed	9	9.2	0.5	Habitat suitable for fish that spawn in riffles or rapids with course substrates.

Waterbody Crossing ID	Waterbody Name	Mean Wetted Width (metres)	Mean Bankfull Width (metres)	Mean Water Depth (metres)	Fish Habitat Potential
RA4-WC-23	Unnamed	60	3.5	Less than 0.8	Poorly defined channel / flow path through a wetland. Habitat may be present for small-bodied fish species and Northern Pike.
RA4-WC-24	Unnamed	1	0.6	0.5	Habitat suitable for fish species adapted to fine / organic substrates. The watercourse connects two unnamed lakes / ponds.
RA4-WC-25	Unnamed	6.8	7.5	More than 2	Habitat suitable for spawners over coarse substrates and aquatic vegetation. Overwintering habitat present.
RA4-WC-26	Unnamed	5.5 / 2.3	5.5 / 2.3	0.8 / 0.4	Habitat suitable for a range of fish due to depths and mixed substrates.
RA4-WC-27	Unnamed	53	178	More than 1	Habitat present for fish species adapted to fine substrates and aquatic vegetation. Overwintering habitat present.
RA4-WC-29	Unnamed	8	8	Less than 1	Poorly defined channel in a wetland with sections of ponded water. Habitat may be present for small-bodied fish species.
RA4-WC-31	Unnamed	2.5	3	0.4	Habitat suitable for fish that are adapted to fine / organic substrates.
RA4-WC-32	Unnamed	50	3	Less than 1	Poorly defined channel / flow path through a wetland. Habitat may be present for small-bodied fish species and Northern Pike.
RA4-WC-34	Albany River	50	70	More than 2	Large and small-bodied fish historically documented. Habitat suitable for a wide range of fish. Overwintering habitat present.
RA4-WC-35	Unnamed	1.3	1.7	0.3	Habitat suitable for fish that are adapted to fine / organic substrates.
RA4-WC-37	Unnamed	9	6	More than 1.5	Habitat suitable for fish that are adapted to fine / organic substrates and aquatic vegetation.
RA4-WC-41	Gourlie Creek	31	34	1.5	The deep, wide, flat habitat likely provides overwintering and spawning habitat.
RA4-WC-42	Unnamed	4	6	0.9	Habitat suitable for fish that are adapted to fine / organic substrates, aquatic vegetation, and woody debris.
RA4-WC-43	Unnamed	25	-	Less than 0.8	Poorly defined channel / flow path through a wetland. Habitat may be present for small-bodied fish species and Northern Pike.
RA4-WC-45	Unnamed	7	10	1.1	Habitat suitable for fish that are adapted to fine / organic substrates, flooded vegetation, and woody debris.
RA4-WC-55	Wabassi River	45	50	1.2	Habitat suitable for all fish due to wide variety of substrates available. Overwintering habitat present.
RA4-WC-57	Unnamed	2	2	0.5	Habitat suitable for fish that are adapted to fine / organic substrates and aquatic vegetation.
RA4-WC-58	Unnamed	5	15	0.8	Habitat suitable for fish that are adapted to fine / organic substrates and woody debris.

8.1.6.2 Fish Community and Distribution

8.1.6.2.1 Construction Disturbance Area

There are 64 crossings in the Construction Disturbance Area where fish are either known to be present or are likely to be present within 2 kilometres (Marshall and Jones, 2011; Royal Ontario Museum, 2016; Scott and Crossman, 1998; Golder, 2013a; Ministry of Natural Resources and Forestry, 2003, 2015a; Government of Ontario, 2014, 2015). Most of the historical fish presence data were gathered during the field survey for the Cliffs Chromite Project (Golder, 2013a).

Many named waterbodies and some smaller unnamed streams have documented fish presence. Waterbodies with defined beds or banks are likely to have fish, even if there's no documented evidence.

Table 8.1-8 summarizes the fish captured in waterbodies during field surveys from 2019 to 2022.

Table 8.1-8: Summary of Fish Captured in Waterbodies Crossed by the Project During Field Surveys (2019 to 2022)

Waterbody Crossing ID	Waterbody Name	Blacknose Shiner	Brook Stickleback	Burbot	Common Shiner	Finescale Dace	Fathead Minnow	Iowa Darter	Johnny Darter	Lake Chub	Mottled Sculpin	Northern Redbelly Dace	Northern Pike	Pearl Dace	Trout-perch	White Sucker	Yellow Perch	Undetermined	Total
RA1-4-WC-01	Unnamed	-	21	-	-	32	-	-	-	-	-	-	-	-	138	-	-	-	**191**
RA1-WC-09	Unnamed	-	41	-	-	48	-	-	-	-	-	-	84	-	26	-	-	-	**199**
RA1-WC-11	Ogoki River	-	-	3	-	-	-	-	-	-	-	1	-	3	-	-	-	1	**8**
RA1-WC-17	Unnamed	-	-	-	-	-	-	-	3		6			1	-	-	-	-	**10**
RA1-WC-22	Unnamed	-	6	-	14	38	2	-	-	-	-	-	-	-	11	2	-	-	**73**
RA1-WC-30	Unnamed	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	**1**
RA1-WC-66	Unnamed	-	6	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	**7**
RA4-WC-00	Unnamed	-	70	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	**78**
RA4-WC-02	Colpitts Creek	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	**2**
RA4-WC-17	Unnamed	-	4	-	-	49	2	1	-	-	-	-	50	-	15	-	-	-	**121**
RA4-WC-21	Unnamed	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**3**
RA4-WC-22	Unnamed	1	-	1	1	-	-	-	9	1	4	-	-	1	-	-	1	1	**20**
RA4-WC-24	Unnamed	-	1	-	-	19	-	-	-	-	-	-	-	-	-	-	-	-	**20**
RA4-WC-25	Unnamed	-	2	-	20	34	-	2	-	-	-	-	-	-	12	8	-	-	**78**
RA4-WC-26	Unnamed	1	4	-	35	34	-	4	-	-	-	-	-	-	16	2	-	-	**96**
RA4-WC-41	Gourlie Creek	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	**1**
Total	-	**2**	**158**	**4**	**70**	**255**	**4**	**15**	**13**	**1**	**10**	**1**	**134**	**6**	**218**	**12**	**3**	**2**	**910**

8.1.6.2.2 Local Study Area

In the Local Study Area, there are 37 fish species, including all the valued component species like Lake Sturgeon, Northern Pike, Brook Trout, Walleye, Lake Whitefish, and Burbot. These fish are important for both recreational fishing and subsistence for Indigenous peoples.

Table 8.1-9 includes fish species likely to be found in the Local Study Area, their preferred habitats, and the number of waterbody crossings that could provide suitable habitats for them.

Table 8.1-9: Fish Species Likely to Occur in the Local Study Area, their Habitat Preferences, and the Number of Waterbody Crossings with the Potential to Provide Habitat

Family	Oji-Cree Name	Common Name (Footnote a)	Scientific Name	Preferred Habitat (Footnote b)	Spawning Season and Habitat (Footnote c)	Waterbody Types where Species was Considered Potentially Present (Footnote d)	Number of Waterbody Crossings with Rearing, Feeding, and Overwintering Habitat (Footnote e) - Alternative 1	Number of Waterbody Crossings with Rearing, Feeding, and Overwintering Habitat (Footnote e) - Alternative 4	Number of Waterbody Crossings with Spawning Habitat (Footnote e) - Alternative 1	Number of Waterbody Crossings with Potential to Provide Spawning Habitat (Footnote e) - Alternative 4
Acipenseridae	nameh	Lake Sturgeon (Footnote f) (Footnote g)	*Acipenser fulvescens*	Cold waters along the bottom of lakes and large watercourses	• Spring spawner • Fast flowing watercourses over rocky substrate or woody debris	• Lakes • Large (more than 10 metres) watercourses with suitable habitat • Albany and Ogoki rivers • Spawning in watercourses	3	4	1	4
Catostomidae	namebin	Longnose Sucker	*Catostomus catostomus*	Cold waters along the bottom of lakes and watercourses	• Spring spawner • Gravel beds in riffle areas in watercourses	• Lakes and watercourses • Spawning in watercourses	47	36	11	13
Catostomidae	mishguajagash	Shorthead Redhorse	*Moxostoma macrolepidotum*	Cool waters along the bottom of lakes and watercourses	• Spring spawner • Gravel beds in riffle areas in watercourses	• Lakes and watercourses • Spawning in watercourses	47	36	9	13
Catostomidae	namebin	Silver Redhorse	*Moxostoma anisurum*	Cool waters along the bottom of lakes and watercourses	• Spring spawner • Gravel beds in fast flowing watercourses	• Lakes and watercourses • Spawning in watercourses	38	36	11	14
Catostomidae	namebin	White Sucker	*Catostomus commersonii*	Cool waters along the bottom of lakes and large watercourses	• Spring spawner • Gravel beds in watercourses	• Lakes and watercourses • Spawning in watercourses	38	36	11	12
Cottidae	ashaawew ginooshe	Mottled Sculpin	*Cottus bairdii*	Cold waters of lakes and watercourses	• Spring spawner • Under a rock or ledge in lakes or watercourses	• Lakes and watercourses	53	51	7	14
Cottidae	ashhawew ginooshe	Slimy Sculpin	*Cottus cognatus*	Cold waters of lakes and watercourses	• Spring spawner • Under a rock or ledge in lakes or watercourses	• Lakes and watercourses	53	51	7	7
Cottidae	emikwaaniiwshtigwan ashaawe	Spoonhead Sculpin	*Cottus ricei*	Cold waters of deep lakes and fast watercourses	• Spring / summer spawner • Lakes or watercourses	• Lakes and watercourses	53	51	7	14
Cyprinidae	ginooshench	Blacknose Shiner	*Notropis heterolepis*	Clear, cool waters of shallow vegetated areas of lakes and slow-moving watercourses with sand, gravel, and silt	• Summer spawner • Deposits adhesive eggs over sand or aquatic vegetation in lakes or watercourses	• Lakes and watercourses	53	51	14	17

Family	Oji-Cree Name	Common Name (Footnote a)	Scientific Name	Preferred Habitat (Footnote b)	Spawning Season and Habitat (Footnote c)	Waterbody Types where Species was Considered Potentially Present (Footnote d)	Number of Waterbody Crossings with Rearing, Feeding, and Overwintering Habitat (Footnote e) - Alternative 1	Number of Waterbody Crossings with Rearing, Feeding, and Overwintering Habitat (Footnote e) - Alternative 4	Number of Waterbody Crossings with Spawning Habitat (Footnote e) - Alternative 1	Number of Waterbody Crossings with Potential to Provide Spawning Habitat (Footnote e) - Alternative 4
Cyprinidae	ginooshench	Bluntnose Minnow	*Pimephales notatus*	Shallow waters in lakes and watercourses	• Summer spawner • Under rocks or woody debris in lakes or watercourses	• Lakes and watercourses	53	51	13	18
Cyprinidae	gwashgwebinew ginooshench	Common Shiner	*Luxilus cornutus*	Cool, shallow watercourses, and occasionally in lakes	• Spring spawner • Under rocks or woody debris in lakes or watercourses	• Lakes and watercourses	53	51	7	14
Cyprinidae	waashgijiiw ginooshench	Emerald Shiner	*Notropis atherinoides*	Cool, open waters of lakes and lower reaches of watercourses	• Summer spawner • Gravel in lakes and watercourses	• Lakes and watercourses	53	51	13	16
Cyprinidae	magishtigwaanew ginooshench	Fathead Minnow	*Pimephales promelas*	Shallow waters in lakes and watercourses	• Spring / summer spawner • Under rocks or woody debris in lakes or watercourses	• Lakes and watercourses	53	51	33	34
Cyprinidae	Waashgijiiw gishooshench	Finescale Dace	*Chrosomus neogaeus*	Cool lakes and watercourses with instream vegetation and silt and detritus substrate	• Spring spawner • Woody debris in watercourses and lakes	• Lakes and watercourses	53	51	33	34
Cyprinidae	Shooniiyaawaapik ginooshench	Golden Shiner	*Notemigonus crysoleucas*	Lakes and watercourses with instream vegetation	• Summer spawner • Instream vegetation in watercourses and lakes	• Lakes and watercourses	53	51	33	34
Cyprinidae	ginooshench	Lake Chub	*Couesius plumbeus*	Cold waters of lakes	• Spring spawner • Sand, gravel, or rocks in watercourses and lakes	• Lakes and watercourses	53	51	15	16
Cyprinidae	ozaaw ginooshench	Longnose Dace	*Rhinichthys cataractae*	Cool, fast flowing waters of watercourses with rocky substrate or in shallow waters of lakes	• Spring / summer spawner • Deposits eggs over substrate in riffles in watercourses	• Lakes and watercourses	53	51	10	12
Cyprinidae	gwashgwebinew ginooshench	Mimic Shiner	*Notropis volucellus*	Vegetated areas of lakes and slow-moving watercourses with sand and gravel substrates	• Summer spawner • Deposits adhesive eggs over aquatic vegetation	• Lakes and watercourses	53	51	30	34
Cyprinidae	shaagawaako ginooshench	Northern Pearl Dace	*Margariscus nachtriebi*	Shallow vegetated areas in cool and cold-water lakes and watercourses	• Spring spawner • Deposits eggs in sand or gravel	• Lakes and watercourses	53	51	13	18

Family	Oji-Cree Name	Common Name (Footnote a)	Scientific Name	Preferred Habitat (Footnote b)	Spawning Season and Habitat (Footnote c)	Waterbody Types where Species was Considered Potentially Present (Footnote d)	Number of Waterbody Crossings with Rearing, Feeding, and Overwintering Habitat (Footnote e) - Alternative 1	Number of Waterbody Crossings with Rearing, Feeding, and Overwintering Habitat (Footnote e) - Alternative 4	Number of Waterbody Crossings with Spawning Habitat (Footnote e) - Alternative 1	Number of Waterbody Crossings with Potential to Provide Spawning Habitat (Footnote e) - Alternative 4
Cyprinidae	ozaawashko ginooshench	Northern Redbelly Dace	*Chrosomus eos*	Vegetated areas of lakes and slow-moving watercourses with silt and detritus substrates	• Spring / summer spawner • Algal beds in lakes and watercourses	• Lakes and watercourses	53	51	26	29
Cyprinidae	Agaachi makadew Bebesi ginooshench	Spottail Shiner	*Notropis hudsonius*	Clear, cold waters of lakes and watercourses	• Spring spawner • Deposits eggs in sand in lakes or watercourses	• Lakes and watercourses	53	51	14	17
Esocidae	najwabe	Northern Pike (Footnote g)	*Esox lucius*	Cool water of lakes and watercourses with instream vegetation	• Spring spawner • Shallow vegetated floodplains of lakes and watercourses	• Lakes and watercourses	37	50	27	28
Lotidae	mihzhash	Burbot	*Lota lota*	Cold waters along the bottom of lakes and large watercourses	• Winter spawner • Sand or gravel substrate in lakes or large watercourses under ice cover	• Lakes and watercourses • Spawning in lakes and large watercourses (bankfull width greater than 5 metres) • Within 2 kilometres of a lake (connected)	16	17	5	7
Gasterosteidae	ginooshench	Brook Stickleback	*Culaea inconstans*	Cool watercourses and lakes	• Spring / summer spawner • Constructs organic debris nest	• Lakes and watercourses	53	51	53	50
Gasterosteidae	gayaagaachenchich ginooshench	Ninespine Stickleback	*Pungitius pungitius*	Cool watercourses and lakes	• Summer spawner • Constructs organic debris nest	• Lakes and watercourses	53	51	26	29
Percidae	ashaawench	Iowa Darter	*Etheostoma exile*	Along the bottom of clear lakes and watercourses	• Spring spawner • Shallow water with woody debris or roots in watercourses and lakes	• Lakes and watercourses	53	51	29	34
Percidae	ashaawe	Johnny Darter	*Etheostoma nigrum*	Along the bottom of lakes and watercourses	• Spring spawner • Under rocks in watercourses and lakes	• Lakes and watercourses	53	51	53	51
Percidae	Shaagaawaako ashaawe	Logperch	*Percina caprodes*	Along the bottom of lakes and watercourses with rocky and sandy substrate	• Spring spawner • Sand or gravel substrate in lakes or watercourses	• Lakes and watercourses	53	51	14	19

Family	Oji-Cree Name	Common Name (Footnote a)	Scientific Name	Preferred Habitat (Footnote b)	Spawning Season and Habitat (Footnote c)	Waterbody Types where Species was Considered Potentially Present (Footnote d)	Number of Waterbody Crossings with Rearing, Feeding, and Overwintering Habitat (Footnote e) - Alternative 1	Number of Waterbody Crossings with Rearing, Feeding, and Overwintering Habitat (Footnote e) - Alternative 4	Number of Waterbody Crossings with Spawning Habitat (Footnote e) - Alternative 1	Number of Waterbody Crossings with Potential to Provide Spawning Habitat (Footnote e) - Alternative 4
Percidae	ashaawench	River Darter (Footnote f)	*Percina shumardi*	Clear, large watercourses, with moderate flows and gravel bottoms	• Spring spawner • Shallow areas of large watercourses over sand or gravel	• Large watercourses (bankfull width greater than or equal to 5 metres)	53	51	13	18
Percidae	gaabaabaatewnaagosich ogaas	Sauger	*Sander canadensis*	Cool waters in lakes and watercourses	• Spring spawner • Sand or gravel substrate in lakes or watercourses	• Lakes and watercourses	21	25	7	10
Percidae	okaas	Walleye	*Sander vitreus*	Cool waters of watercourse and lakes	• Spring spawner • Gravel or rocky substrate in lakes or watercourses	• Lakes and watercourses	21	25	7	9
Percidae	ajaawes	Yellow Perch	*Perca flavescens*	Slow-moving watercourses and lakes	• Spring spawner • Over vegetation or wood debris in lakes and watercourses	• Lakes and watercourses	34	31	23	23
Percopsidae	Namegosi ashaawench	Trout-perch	*Percopsis omiscomaycus*	Cool lakes and occasionally watercourses	• Spring / summer spawner • Rocky substrates in lakes and watercourses	• Lakes and watercourses	53	51	16	18
Salmonidae	masamekos	Brook Trout (Footnote g)	*Salvelinus fontinalis*	Cold, well-oxygenated watercourses and lakes	• Fall spawner • Gravel substrates in riffles in watercourses or groundwater upwelling areas in lakes	• Lakes and watercourses	23	28	5	10
Salmonidae	namegisooginoshe	Cisco	*Coregonus artedi*	Cold, deeper waters of lakes and occasionally large watercourses (bankfull width more than 5 metres)	• Fall spawner • Gravel substrates in lakes in shallow or deep water and potentially larger watercourses (bankfull width more than 5 metres)	• Lakes • Large watercourses • Spawning in lakes	3	3	0	0
Salmonidae	namegos	Lake Trout	*Salvelinus namaycush*	Cold-water lakes and occasionally large watercourses (bankfull width more than 5 metres)	• Fall spawner • Rocky substrates in deep water lakes	• Lakes • Large watercourses • Spawning in lakes	3	4	2	3

Family	Oji-Cree Name	Common Name (Footnote a)	Scientific Name	Preferred Habitat (Footnote b)	Spawning Season and Habitat (Footnote c)	Waterbody Types where Species was Considered Potentially Present (Footnote d)	Number of Waterbody Crossings with Rearing, Feeding, and Overwintering Habitat (Footnote e) - Alternative 1	Number of Waterbody Crossings with Rearing, Feeding, and Overwintering Habitat (Footnote e) - Alternative 4	Number of Waterbody Crossings with Spawning Habitat (Footnote e) - Alternative 1	Number of Waterbody Crossings with Potential to Provide Spawning Habitat (Footnote e) - Alternative 4
Salmonidae	atikameg	Lake Whitefish (Footnote g)	*Coregonus clupeaformis*	Cold, deeper waters of lakes and occasionally large watercourses (bankfull width more than 5 metres)	• Fall spawner • Rocky substrates in lakes and potentially larger watercourses	• Lakes • Large watercourses • Spawning in lakes	3	4	2	3

Footnotes: (a) Species list collated from the desktop review and field study (Attachment B) (Committee on the Status of Endangered Wildlife in Canada, 2016a, 2017a; Holm et al., 2010; Eakins, 2023; Golder, 2013a; Government of Ontario, 2015; Marshall and Jones, 2011; Scott and Crossman, 1998).

(b) High-level summary of preferred habitat based on Scott and Crossman (1998) and Holm et al. (2010). Note the temperature descriptions (such as, warm, cold, and cool) may not directly correspond to the Ministry of Natural Resources thermal regime definitions.

(c) Spawning habitat requirements based on Scott and Crossman (1998), Holm et al. (2010), and Eakins (2023).

(d) Waterbody types where species were considered potentially present were determined using the preferred and spawning habitat characteristics and known distributions (Holm et al., 2010; Eakins, 2023; Golder, 2013a; Government of Ontario, 2015; Marshall and Jones, 2011; Scott and Crossman, 1998).

(e) For each waterbody crossing, if the waterbody type was determined to potentially support that fish species, the waterbody crossing was determined to provide potential habitat for that fish species. For crossings where site-specific data were collected (Attachment B), the potential habitat was rated based on the site-specific data.

(f) Southern Hudson Bay – James Bay and Great Lakes – Upper St. Lawrence Populations.

(g) Valued component fish species.

8.1.6.3 Species of Cultural and Conservation Concern

A number of fish species have been identified as culturally important to Indigenous communities including Aroland First Nation, Kashechewan First Nation, Fort Albany First Nation, Marten Falls First Nation, and Nibinamik First Nation. These communities have highlighted the importance of species including Brook Trout, Lake Trout, Lake Sturgeon, Northern Pike, Sucker, Walleye, Sauger, Lake Whitefish, Salmon, and Rainbow Trout (Dillon, 2024a, 2024b; Firelight Research Inc., 2024; MNP LPP, 2024b; Marten Falls First Nation, 2023b). Members of Kashechewan First Nation have identified the pristine habitat provided by the Kistachowan Sipi (Albany River) watershed that flows through Kashechewan's traditional territory where a variety of fish are harvested through angling, gillnets, and ice fishing in the winter (MNP LPP, 2024b). In addition to the above, Weenusk First Nation noted the overall cultural importance of fish to the community (MNP LPP, 2024a).

Lake Sturgeon in the existing conditions Regional Study Area are part of the Southern Hudson Bay – James Bay population, they are listed as "Special Concern" under the *Species at Risk Act,* Schedule 1 (Government of Canada, 2002) and Species at Risk in Ontario List (Government of Ontario, 2008). This population is considered the most robust and least at risk of all the Lake Sturgeon populations in Ontario (Committee on the Status of Species at Risk in Ontario, 2017a). The Southern Hudson Bay-James Bay population of River Darter (Percina shumardi; Oji-Cree translation, ashaawench) are federally and provincially listed as "Not at Risk" by both the Species at Risk in Ontario List (Government of Ontario, 2008) and the Committee on the Status of Endangered Wildlife in Canada (2016b), respectively.

Although Blackfin Cisco (Coregonus nigripinnis, Oji-Cree translation, wiibichiiw ya'haa) were found in 2006 downstream from the Waboose Dam on the Ogoki Reservoir (Long Lake, 2008; Golder, 2013a), they were not considered likely to be present in the existing conditions Construction Disturbance Area, Local Study Area, or Regional Study Area. Blackfin Cisco are not listed under *Species at Risk Act,* Schedule 1, but are listed as Threatened under Schedule 2 (*Species at Risk Act,* Schedule 1 provisions do not apply). They are listed as "Unrankable" by the Natural Heritage Information Centre (Government of Ontario, 2015) and "Data Deficient" under the federal Committee on the Status of Endangered Wildlife in Canada (Government of Canada, 2025a) and the Species at Risk in Ontario List (Government of Ontario, 2008).

Table 8.1-10 lists fish species and their conservation status. The fish species are typical of cold and cool water environments in Ontario and include forage fish, sportfish, and species of conservation concern. Cold waterbodies typically have Lake Sturgeon, Lake Whitefish, and Brook Trout (Holm et al., 2010; Eakins, 2023), while cool waterbodies usually have Walleye, Northern Pike, and Yellow Perch. (Holm et al., 2010; Eakins, 2023).

Table 8.1-10: Fish Species Likely to Occur in the Local Study Area and Conservation Ranking

Family	Oji-Cree Name	Common Name (Footnote a)	Scientific Name	Committee on the Status of Endangered Wildlife in Canada (Footnote b) Federal	Species at Risk Act (Footnote b) Federal	Species at Risk in Ontario (Footnote c) Provincial	S Rank (Footnote d) Provincial	Thermal Regime (Footnote e)
Acipenseridae	nameh	Lake Sturgeon (Footnote f) (Footnote g)	Acipenser fulvescens	**Threatened:** (Great Lakes – Upper St. Lawrence Population) **Special Concern:** (Southern Hudson Bay – James Bay population)	**No Status:** (Great Lakes – Upper St. Lawrence Population) **Special Concern:** (Southern Hudson Bay – James Bay population)	**Endangered:** (Footnote h) (Great Lakes – Upper St. Lawrence Population) **Special Concern:** (Southern Hudson Bay – James Bay Population)	**S2:** (Great Lakes – Upper St. Lawrence Population) **S3:** (Southern Hudson Bay – James Bay population)	Cold
Catostomidae	namebin	Longnose Sucker	Catostomus catostomus	Not applicable	Not applicable	Not applicable	S5	Cold
Catostomidae	mishguajagash	Shorthead Redhorse	Moxostoma macrolepidotum	Not applicable	Not applicable	Not applicable	S5	Warm
Catostomidae	namebin	Silver Redhorse	Moxostoma anisurum	Not applicable	Not applicable	Not applicable	S4	Cool
Catostomidae	namebin	White Sucker	Catostomus commersonii	Not applicable	Not applicable	Not applicable	S5	Cool
Cottidae	ashaawew ginooshe	Mottled Sculpin	Cottus bairdii	Not applicable	Not applicable	Not applicable	S5	Cool
Cottidae	ashhawew ginooshe	Slimy Sculpin	Cottus cognatus	Not applicable	Not applicable	Not applicable	S5	Cold
Cottidae	emikwaaniiwshtigwan ashaawe	Spoonhead Sculpin	Cottus ricei	Not at Risk	Not applicable	Not at Risk	S4	Cold
Cyprinidae	ginooshench	Blacknose Shiner	Notropis heterolepis	Not applicable	Not applicable	Not applicable	S5	Cool
Cyprinidae	ginooshench	Bluntnose Minnow	Pimephales notatus	Not at Risk	Not applicable	Not at Risk	S5	Warm
Cyprinidae	gwashgwebinew ginooshench	Common Shiner	Luxilus cornutus	Not applicable	Not applicable	Not applicable	S5	Cool
Cyprinidae	waashgijiiw ginooshench	Emerald Shiner	Notropis atherinoides	Not applicable	Not applicable	Not applicable	S5	Cool
Cyprinidae	magishtigwaanew ginooshench	Fathead Minnow	Pimephales promelas	Not applicable	Not applicable	Not applicable	S5	Warm
Cyprinidae	waashgijiiw gishooshench	Finescale Dace	Chrosomus neogaeus	Not applicable	Not applicable	Not applicable	S5	Cool
Cyprinidae	shooniiyaawaapik ginooshench	Golden Shiner	Notemigonus crysoleucas	Not applicable	Not applicable	Not applicable	S5	Cool
Cyprinidae	ginooshench	Lake Chub	Couesius plumbeus	Not applicable	Not applicable	Not applicable	S5	Cold
Cyprinidae	ozaaw ginooshench	Longnose Dace	Rhinichthys cataractae	Not applicable	Not applicable	Not applicable	S5	Cool
Cyprinidae	gwashgwebinew ginooshench	Mimic Shiner	Notropis volucellus	Not applicable	Not applicable	Not applicable	S5	Warm
Cyprinidae	shaagawaako ginooshench	Northern Pearl Dace	Margariscus nachtriebi	Not applicable	Not applicable	Not applicable	S5	Cool
Cyprinidae	ozaawashko ginooshench	Northern Redbelly Dace	Chrosomus eos	Not applicable	Not applicable	Not applicable	S5	Cool
Cyprinidae	Agaachi makadew Bebesi ginooshench	Spottail Shiner	Notropis hudsonius	Not applicable	Not applicable	Not applicable	S5	Cool
Esocidae	najwabe	Northern Pike (Footnote f)	Esox lucius	Not applicable	Not applicable	Not applicable	S5	Cool
Lotidae	mihzhash	Burbot	Lota lota	Not applicable	Not applicable	Not applicable	S5	Cold
Gasterosteidae	ginooshench	Brook Stickleback	Culaea inconstans	Not applicable	Not applicable	Not applicable	S5	Cool

Family	Oji-Cree Name	Common Name (Footnote a)	Scientific Name	Committee on the Status of Endangered Wildlife in Canada (Footnote b) Federal	Species at Risk Act (Footnote b) Federal	Species at Risk in Ontario (Footnote c) Provincial	S Rank (Footnote d) Provincial	Thermal Regime (Footnote e)
Gasterosteidae	gayaagaachenchich ginooshench	Ninespine Stickleback	Pungitius pungitius	Not applicable	Not applicable	Not applicable	S5	Cool
Percidae	ashaawench	Iowa Darter	Etheostoma exile	Not applicable	Not applicable	Not applicable	S5	Cool
Percidae	ashaawe	Johnny Darter	Etheostoma nigrum	Not applicable	Not applicable	Not applicable	S5	Cool
Percidae	haagaawaako ashaawe	Logperch	Percina caprodes	Not applicable	Not applicable	Not applicable	S5	Warm
Percidae	ashaawench	River Darter (Footnote g)	Percina shumardi	**Not at Risk:** Southern Hudson Bay – James Bay population **Endangered:** Great Lakes – Upper St. Lawrence	**Not applicable:** Southern Hudson Bay – James Bay population **Not applicable:** Great Lakes – Upper St. Lawrence	**Not at Risk:** Southern Hudson Bay – James Bay population **Endangered:** Great Lakes – Upper St. Lawrence	**S4:** Southern Hudson Bay – James Bay population **S1:** Great Lakes – Upper St. Lawrence	Warm
Percidae	gaabaabaatewnaagosich ogaas	Sauger	Sander canadensis	Not applicable	Not applicable	Not applicable	S4	Cool
Percidae	okaas	Walleye (Footnote f)	Sander vitreus	Not applicable	Not applicable	Not applicable	S5	Cool
Percidae	ajaawes	Yellow Perch	Perca flavescens	Not applicable	Not applicable	Not applicable	S5	Cool
Percopsidae	Namegosi ashaawench	Trout-perch	Percopsis omiscomaycus	Not applicable	Not applicable	Not applicable	S5	Cold
Salmonidae	masamekos	Brook Trout (Footnote f)	Salvelinus fontinalis	Not applicable	Not applicable	Not applicable	S5	Cold
Salmonidae	namegisooginoshe	Cisco	Coregonus artedi	Not applicable	Not applicable	Not applicable	S5	Cold
Salmonidae	namegos	Lake Trout	Salvelinus namaycush	Not applicable	Not applicable	Not applicable	S5	Cold
Salmonidae	atikameg	Lake Whitefish (Footnote f)	Coregonus clupeaformis	Not applicable	Not applicable	Not applicable	S5	Cold

Footnotes:
(a) Species list collated from the desktop review [Fish and Fish Habitat Technical Support Document (**Appendix G**); Committee on the Status of Endangered Wildlife in Canada, 2016a, 2017a; Royal Ontario Museum, 2016; Eakins, 2023; Golder, 2013a; Government of Ontario, 2015; Ministry of Natural Resources and Forestry, 2023a; Holm et al., 2010; Marshall and Jones, 2011; Scott and Crossman, 1998] and field study. Rainbow Trout and Salmon were identified through Indigenous Knowledge but have not been added to the species list as no details on location or identification were available.
(b) Committee on the Status of Endangered Wildlife in Canada, 2023; Government of Canada, 2002.
(c) Holm et al., 2010; Eakins, 2023; Government of Ontario, 2008; Government of Ontario, 2014.
(d) Holm et al., 2010; Eakins, 2023; Government of Ontario, 2020a. S1 = critically imperiled, S2 = imperiled; S3 = vulnerable; S4 = apparently secure; S5 = secure; SNA = not applicable; SU = Unrankable.
(e) Holm et al., 2010; Eakins, 2023; Ministry of Natural Resources, 2004.
(f) Valued component fish species.
(g) Under the Committee on the Status of Endangered Wildlife in Canada, the northwestern Ontario population of Lake Sturgeon within the Project study areas include the Great Lakes – Upper St. Lawrence and Southern Hudson Bay – James Bay populations (Committee on the Status of Endangered Wildlife in Canada, 2017a), and the northwestern Ontario population of River Darter within the Project study areas include the Great Lakes – Upper St. Lawrence and Southern Hudson Bay – James Bay populations (Committee on the Status of Endangered Wildlife in Canada, 2016b).
(h) Fisheries and Oceans Canada, 2013, Ontario Ministry of Natural Resources, 2013; Northwest Region.
Not applicable = not documented or not listed.

8.1.6.4 Invasive Species

Rock Bass (Ambloplites rupestris), a native fish species, are found in small numbers in the Far North but may be expanding their range (Marshall and Jones, 2011). They were first documented in the 1960s and 1970s in lakes at the headwaters of the Berens and Albany Rivers (Marshall and Jones, 2011). In 2001, they were also found in Makokibatan Lake and the Ogoki River system (Marshall and Jones, 2011). This expansion might be due to climate warming. The presence of Rock Bass in the Far North could be considered invasive in some areas (Marshall and Jones, 2011).

Smallmouth Bass (Micropterus dolomieu) were documented in 2009 at the Albany Forks (Albany-Kenogami Junction) in the existing conditions Regional Study Area. Previously they were only found the Moose River (Oji-Cree translation, Mooz "O" Ziibih) basin (Seyler, 1997 in Marshall and Jones, 2011).

8.1.6.5 Benthic Invertebrates

For Alternative 1, 23 sites were sampled for benthic invertebrates. Of these, 21 sites were in depositional habitats (areas where sediments are deposited) with fine sediments and organic material, and 2 sites were in erosional habitats (areas where sediments are eroded) with coarser substrates like gravel and cobble.

For Alternative 4, 22 sites were sampled. Sixteen sites were in depositional habitats with fine sediments and organic material, and six sites were in erosional habitats with coarser substrates like gravel and cobble.

Ephemeroptera (mayflies), Plecoptera (stoneflies), and Tricoptera (caddisflies) richness was looked at, which refers to the number of distinct taxa (species or groups) within three orders of aquatic insects: Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies). These insects are sensitive to pollution, so their presence and diversity are used as indicators of water quality. Ephemeroptera (mayflies), Plecoptera (stoneflies), and Tricoptera (caddisflies) density was also looked at which is the number of individuals within the Ephemeroptera, Plecoptera, and Trichoptera orders per unit area or volume of water.

Table 8.1-11 provides a summary of the benthic invertebrate sampling results for both Alternative 1 and Alternative 4.

Table 8.1-11: Summary of Benthic Invertebrate Sampling Results in Waterbodies Crossed by Alternative 1 and Alternative 4

Alternative	Waterbody Crossing ID	Type of Habitat	Total Density (Organisms per Square Metre)	Richness (Taxa / Station)	EPT Density (Organisms per Square Metre)	EPT Richness (Footnote a)	Simpson's Diversity Index	Simpson's Evenness Index
1	RA1-WC-01	Erosional	17,625	38	4,822	8	0.90	0.26
1	RA1-WC-02	Depositional	24,828	16	2,759	3	0.89	0.56
1	RA1-WC-09	Depositional	5,287	9	0	0	0.77	0.49
1	RA1-WC-14	Depositional	25,776	17	920	2	0.71	0.20
1	RA1-WC-14	Depositional	16,580	15	1,839	3	0.85	0.43
1	RA1-WC-22	Depositional	8,851	11	1,839	2	0.85	0.59
1	RA1-WC-23	Depositional	12,874	16	1,839	1	0.91	0.72
1	RA1-WC-26	Depositional	6,897	6	0	0	0.44	0.30
1	RA1-WC-27	Erosional	2,056	46	1,084	17	0.83	0.14
1	RA1-WC-28	Depositional	1,149	4	0	0	0.70	0.83
1	RA1-WC-30	Depositional	7,141	18	474	3	0.92	0.68
1	RA1-WC-32	Depositional	19,440	16	1,049	2	0.90	0.61
1	RA1-WC-41	Depositional	4,899	18	690	2	0.94	0.87
1	RA1-WC-51	Depositional	7,356	13	920	2	0.90	0.82
1	RA1-WC-57	Depositional	12,672	19	2,543	4	0.86	0.38
1	RA1-WC-66	Depositional	12,874	17	0	0	0.86	0.41
1	RA1-WC-67	Depositional	12,486	23	489	4	0.90	0.45
1	RA1-4-WC-01	Depositional	15,632	16	230	1	0.87	0.49
1	RA1-4-WC-07	Depositional	16,552	12	0	0	0.86	0.61
1	RA1-4-WC-33	Depositional	12,644	15	230	1	0.87	0.52
1	RA1-4-WC-35	Depositional	9,310	16	230	2	0.86	0.45
1	RA1-4-WC-36	Depositional	5,690	28	1,480	7	0.85	0.23
1	RA1-4-WC-37	Depositional	18,851	15	0	0	0.74	0.25
4	RA4-WC-00	Depositional	81,523	38	5,977	3	0.91	0.30
4	RA4-WC-02	Depositional	8,908	30	3,032	8	0.91	0.37
4	RA4-WC-15	Erosional	5,287	9	0	0	0.77	0.54
4	RA4-WC-18	Erosional	25,776	17	920	2	0.71	0.24
4	RA4-WC-21	Depositional	6,897	8	460	1	0.85	0.85
4	RA4-WC-22	Erosional	2,842	34	1,227	15	0.77	0.14
4	RA4-WC-26	Erosional	1,328	28	215	4	0.94	0.59
4	RA4-WC-31	Erosional	858	24	47	5	0.80	0.21
4	RA4-WC-34	Erosional	327	15	68	2	0.78	0.28
4	RA4-WC-37	Depositional	6,437	6	0	0	0.73	0.63
4	RA4-WC-42	Depositional	16,365	22	1,839	3	0.90	0.45
4	RA4-WC-45	Depositional	17,069	20	57	1	0.73	0.19
4	RA4-WC-55	Depositional	10,330	22	72	2	0.86	0.15
4	RA4-WC-57	Depositional	9,655	14	230	1	0.77	0.32
4	RA4-WC-58	Depositional	19,080	24	690	1	0.87	0.33
4	RA4B-WC-02	Depositional	17,945	15	1,379	3	0.78	0.30
4	RA1-4-WC-01	Depositional	15,632	16	230	1	0.87	0.49
4	RA1-4-WC-07	Depositional	16,552	12	0	0	0.86	0.61
4	RA1-4-WC-33	Depositional	12,644	15	230	1	0.87	0.52
4	RA1-4-WC-35	Depositional	9,310	16	230	2	0.86	0.45
4	RA1-4-WC-36	Depositional	5,690	28	1,480	7	0.85	0.23
4	RA1-4-WC-37	Depositional	18,851	15	0	0	0.74	0.25

Footnotes: (a) EPT = Ephemeroptera (mayflies), Plecoptera (stoneflies), and Tricoptera (caddisflies).

8.1.6.6 Restricted Activity Timing Windows

Restricted activity timing windows are designed to protect fish during spawning migrations and other critical life history stages (in other words, spawning, egg incubation, and fry emergence). Restricted activity timing windows are determined by the Ministry of Natural Resources for water features in Ontario. The restricted activity timing window in the spring covers migration and spawning for spring spawning species, and the completion of egg incubation and fry emergence. The restricted activity timing window in the fall begins with migration to fall spawning habitats and continues through egg incubation and emergence the following spring. The Project is in the Northwest Region of Ontario for designation of the restricted activity timing windows (Fisheries and Oceans Canada, 2013). The restricted activity timing window for each species is listed in **Table 8.1-12.**

Table 8.1-12: Restricted Activity Timing Windows by Fish Species

Species	Restricted Activity Timing Window
Burbot, Brook Trout, Cisco	September 1 to June 15
Lake Sturgeon	May 1 to June 30
Lake Whitefish	September 15 to May 31
Lake Trout	September 1 to May 31
Northern Pike, Sucker sp.	April 1 to June 15
Walleye	April 1 to June 20
Spring spawning small-bodied species from the Cottidae, Cyprinidae, Gasterosteidae, Percidae (excluding Walleye), and Percopsidae families	April 1 to June 15

8.1.7 Groundwater and Geochemistry

In support of the groundwater and geochemistry existing conditions review, a desktop assessment was completed which reviewed existing information available in the area, additionally a field investigation was conducted from 2021 to 2023 which included the installation of new groundwater monitoring wells, and collection of samples from these wells in spring, summer, and fall.

8.1.7.1 Study Area

The desktop assessment found that there are two major regions within the study area: Precambrian Shield and Hudson Bay Lowland. The Precambrian Shield has older crystalline bedrock, while the Hudson Bay Lowlands have younger sedimentary bedrock. The sand and gravel materials in the area are less permeable and usually form

barriers to water flow (aquitards). The overburden aquifer deposits in the area consist of four main types (Wang and Chin, 1978):

- Sand and gravel in eskers;
- Sand and gravel in outwash deposits;
- Sand in glaciolacustrine deposits; and
- Sand till associated with moraines.

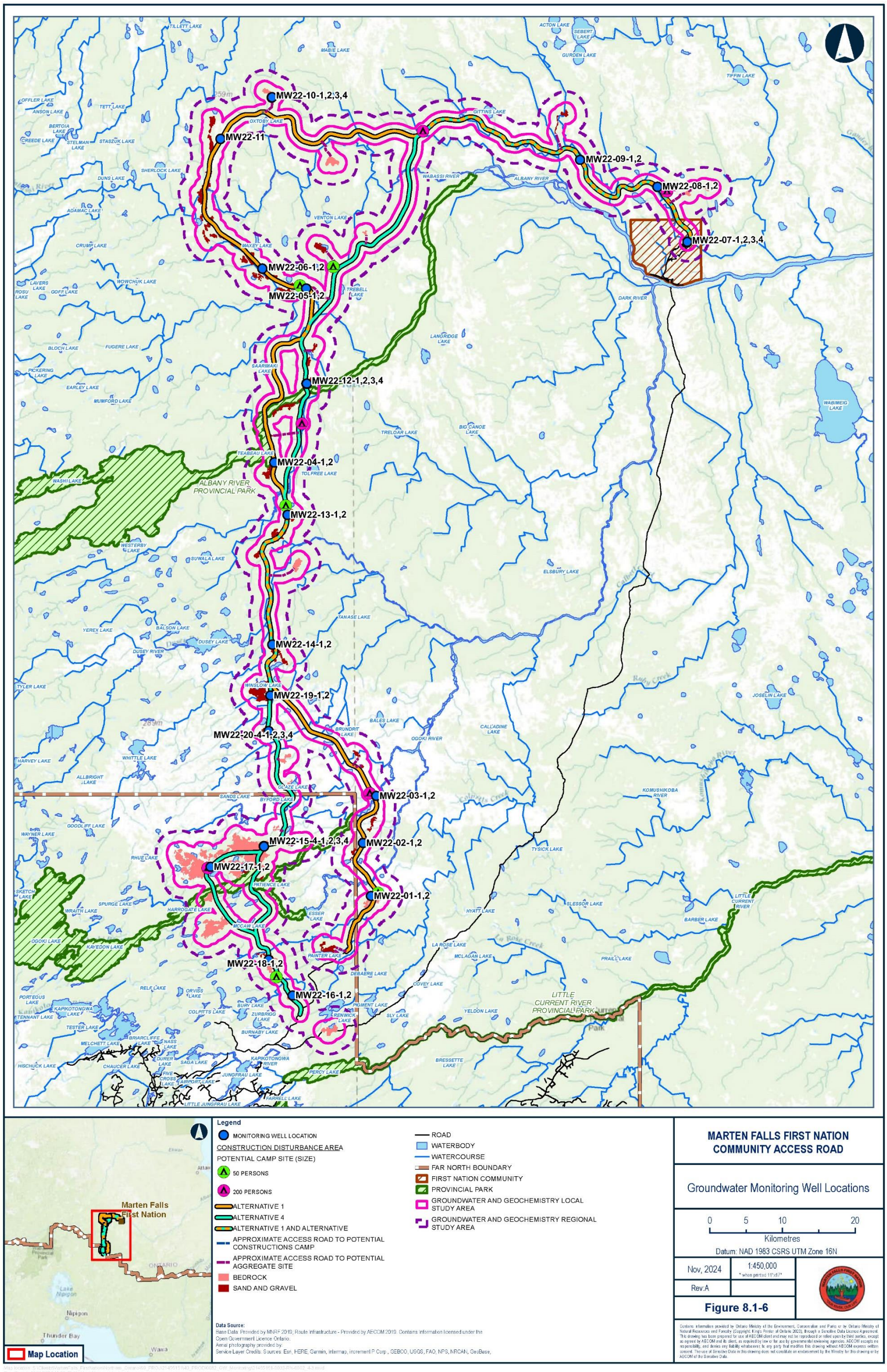
Studies of Northern Ontario's hydrogeology show that the water table generally follows the shape of the ground surface, with gentle horizontal slopes. In higher areas, groundwater flows downward, while in river valleys, it flows upward (Wang and Chin, 1978). The study area is not located within any source protection areas (Ministry of the Environment, Conservation and Parks, 2015).

8.1.7.2 Existing Water Wells

Review of the water well records database maintained by the Ministry of the Environment, Conservation and Parks indicated that there were no well records within the existing conditions Regional Study Area (Ministry of the Environment, Conservation and Parks, 2024a). Thirteen well records were located just outside the existing conditions Regional Study Area (within about 6 kilometres of the Community Access Road centreline). These wells were drilled to depths of 32 to 50 metres below ground surface with bedrock encountered at approximately 10 to 30 metres below ground surface. One well recorded a water level of 3.7 metres below ground surface (**Figure 8.1-6**).

Nine well records were located just west or northwest of Marten Falls and included five test wells, three water supply wells, and one abandoned well record. These well records recorded well depths of 21 to 45 metres below ground surface with four wells recording depths to bedrock of 6 to 20 metres below ground surface. The recorded static groundwater levels ranged from 2.7 to 15.5 metres below ground surface. In 2012, six monitoring wells were installed around the community landfill. These wells were drilled to depths of about 6 to 11 metres below ground surface and recorded water levels of 3.4 to 8.9 metres below ground. According to Marten Falls First Nation and the Ministry of the Environment, Conservation and Parks, these wells are not used for water supply.

Figure 8.1-6: Groundwater Monitoring Well Locations



Marten Falls First Nation representatives were consulted about water supply wells in the Community, they indicated that there were no drinking water supply wells in the Community but noted that there were some monitoring wells associated with the landfill and that there was a well in use at the community airport. No information on spring water sources was available. Follow-up consultation with the airport operator (Ontario Ministry of Transportation) revealed that the well at the airport was not a source of potable water. Based on these consultations it is understood that groundwater is not used for drinking water in Marten Falls and therefore the water supply well sampling program originally proposed for the Community was not carried out.

The complete description of groundwater and geochemistry existing conditions is documented in the Groundwater Technical Support Document (**Appendix H**).

8.1.7.3 Borehole Drilling Investigations

During the groundwater field investigations, boreholes were drilled to install monitoring wells. The geological materials found while drilling were recorded by staff. Locations can be found on **Figure 8.1-6**.

The surficial materials encountered at the borehole sites were mostly dark brown organic material, silt and sand. Surficial organic and peat-like material extended to depths of 0.02 to 2.29 metres below ground surface, with an average thickness of about 0.73 metres. Organic materials were encountered at surface in all boreholes except for at six locations (MW22-05, MW22-07, MW22-09, MW22-13, MW22-14, and MW22-19) where surficial deposits ranging from sandy silt, silty sand, and clayey silt were encountered. Below the organic layer, there were deposits ranging from silt to gravelly sand, except at five locations where silty clay and clay were found (MW22-01, MW22-03, MW22-08, MW22-12, and MW22-20).

The overburden (loose material above bedrock) generally consisted of silt to sand, with thicknesses from 1.37 to 11.28 metres (depth of exploration). Deposits of clayey silt, silt and clay, or silty clay were generally interbedded within the silt to sand deposits except for at five locations (MW22-04, MW22-06, MW22-13, MW22-15, and MW22-17), where coarser deposits ranging in gradation from silty sand, gravelly silt and sand, sand, gravelly sand, and sand and gravel were encountered from 0.02 to 11.28 metres below ground surface and ranged in thickness from 3.91 to 11.23 metres.

Coarse grained, light to dark grey granitoid bedrock was encountered and cored at six locations (MW22-01, MW22-15, MW22-16, MW22-17, MW22-18, and MW22-20). Depth to bedrock ranged from 1.37 to 9.14 metres below ground surface.

8.1.7.4 Groundwater Quality

Previous regional studies of groundwater quality have shown that groundwater in Northern Ontario often exceeds drinking water aesthetic guidelines for hardness (over 100 milligrams per litre) and iron (over 0.3 milligrams per litre) (Wang and Chin, 1978).

Groundwater samples were collected from selected monitoring wells as part of this program. Samples were taken from all sites during three monitoring events in 2023 (June / July, August, and September). A few samples were also collected in November 2022, but the availability of wells was limited due to ongoing drilling and freezing temperatures.

The groundwater results are summarized below where exceedances of regulatory guidelines were observed and detailed results are provided in the Groundwater Technical Support Document (**Appendix H**).

- Some groundwater samples exceeded the maximum acceptable concentrations for total and dissolved metals according to the Canadian Drinking Water Quality Guidelines and Ontario Drinking Water Quality Standards:
  - Dissolved arsenic (11.1 to 27.6 micrograms per litre), dissolved manganese (121 to 889 micrograms per litre), and dissolved uranium (40.8 to 46.8 micrograms per litre) exceeded the Canadian Drinking Water Quality Guidelines maximum acceptable concentration;
  - Total aluminum (3,060 to 535,000 micrograms per litre), total arsenic (11 to 120 micrograms per litre), total barium (3,160 to 4,300 micrograms per litre) total chromium (50.2 to 1,120 micrograms per litre), total lead (5.36 to 297 micrograms per litre), total manganese (124 to 17,400 micrograms per litre), and total uranium (50.9 to 69 micrograms per litre) exceeded the Canadian Drinking Water Quality Guidelines maximum acceptable concentration;
  - Dissolved arsenic (12.3 to 24.9 micrograms per litre) and dissolved uranium (40.8 to 46.8 micrograms per litre), exceeded the Ontario Drinking Water Quality Standards maximum acceptable concentration; and
  - Total arsenic (11 to 120 micrograms per litre), total barium (1,200 to 4,300 micrograms per litre), total chromium (50.2 to 1,120 micrograms per litre), total lead (10.6 to 297 micrograms per litre), total thorium (0.1 to 254 micrograms per litre) and total uranium (50.9 to 69.8 micrograms per litre) exceeded the Ontario Drinking Water Quality Standards maximum acceptable concentration.

- Some groundwater samples exceeded the water quality standards for total and dissolved metals and volatile organic compounds, according to the Soil, Groundwater, and Sediment Standards and Provincial Water Quality Objectives:
  - Total arsenic (109 to 120 micrograms per litre), total boron (315 to 547 micrograms per litre), total cadmium (0.204 to 4.06 micrograms per litre), total hexavalent chromium (1.04 to 2.07 micrograms per litre), total cobalt (0.91 to 311 micrograms per litre), total copper (5.46 to 666 micrograms per litre), total iron (303 to 616,000 micrograms per litre), total molybdenum (81.5 micrograms per litre), total nickel (26.7 to 767 micrograms per litre), total silver (0.102 to 21.3 micrograms per litre), total thallium (0.309 to 7.37 micrograms per litre), total tungsten (31.5 to 95.5 micrograms per litre), total uranium (5.82 to 69.8 micrograms per litre), total vanadium (6.03 to 1,250 micrograms per litre), total zinc (30.6 to 1,440 micrograms per litre) and total zirconium (4.26 to 309 micrograms per litre) exceeded the Provincial Water Quality Objectives;
  - Dissolved antimony (1.6 micrograms per litre), dissolved arsenic (13.6 to 27.6 micrograms per litre), dissolved beryllium (0.51 to 0.58 micrograms per litre) dissolved copper (11.8 to 20.2 micrograms per litre), dissolved molybdenum (8.4 micrograms per litre), dissolved nickel (14.6 micrograms per litre), dissolved uranium (10.7 to 46.8 micrograms per litre), dissolved vanadium (3.9 to 9.2 micrograms per litre), and dissolved zinc (194 micrograms per litre) exceeded the Soil, Groundwater, and Sediment Standards;
  - Dissolved hexavalent chromium (1.01 to 1.49 micrograms per litre), dissolved cobalt (0.93 to 2.74 micrograms per litre), dissolved copper (11.8 to 20.2 micrograms per litre), dissolved iron (318 to 14,600 micrograms per litre), dissolved molybdenum (84.4 micrograms per litre), dissolved silver (0.106 to 0.138 micrograms per litre), dissolved tungsten (30.6 to 89.8 micrograms per litre), dissolved uranium (5.35 to 46.8 micrograms per litre), dissolved vanadium (8.4 to 9.22 micrograms per litre), dissolved zinc (32.2 to 194 micrograms per litre) and dissolved zirconium (4.35 to 5.91 micrograms per litre) exceeded the Provincial Water Quality Objectives;
  - Toluene (910 to 4,610 micrograms per litre) exceeded the Provincial Water Quality Objectives; and
  - Dichloromethane (5,900 to 20,900 micrograms per litre), ethylbenzene (530 to 1,360 micrograms per litre), and toluene (910 to 4,610 micrograms per litre) exceeded the Soil, Groundwater, and Sediment Standards.

- Some groundwater samples exceeded the aesthetic objectives and operational guidelines for total and dissolved metals, dissolved organic carbon, total dissolved solids, hardness, and pH, according to the Canadian Drinking Water Quality Guidelines and Ontario Drinking Water Quality Standards:
  - Total aluminum (101 to 535,000 micrograms per litre), total iron (122 to 616,000 micrograms per litre), and total manganese (21 to 17,400 micrograms per litre) exceeded the Canadian Drinking Water Quality Guidelines Aesthetic Objectives and Operational Guidelines;
  - Dissolved aluminum (101 to 1,040 micrograms per litre), dissolved iron (110 to 14,600 micrograms per litre), and dissolved manganese (20.6 to 889 micrograms per litre) exceeded the Canadian Drinking Water Quality Guidelines Aesthetic Objectives and Operational Guidelines;
  - Total dissolved solids (501 and 1,320 milligrams per litre) and pH (6.66 and 6.97) exceeded the Canadian Drinking Water Quality Guidelines Aesthetic Objectives and Operational Guidelines;
  - Total aluminum (101 to 535,000 micrograms per litre), total iron (303 to 616,000 micrograms per litre), and total manganese (50.2 to 17,400 micrograms per litre) exceeded the Ontario Drinking Water Quality Standards Aesthetic Objectives and Operational Guidelines;
  - Dissolved aluminum (101 to 1,040 micrograms per litre), dissolved iron (318 to 14,600 micrograms per litre), and dissolved manganese (53.6 to 889 micrograms per litre) exceeded the Ontario Drinking Water Quality Standards Aesthetic Objectives and Operational Guidelines;
  - Total alkalinity as calcium carbonate (16.3 to 29.9 milligrams per litre, and 602 to 892 milligrams per litre) exceeded the Ontario Drinking Water Quality Standards Aesthetic Objectives and Operational Guidelines; and
  - Dissolved hardness as calcium carbonate (19 to 76 milligrams per litre, and 103 to 356 milligrams per litre) total dissolved solids (501 and 1,320 milligrams per litre), and dissolved organic carbon (5.02 to 56.8 milligrams per litre) exceeded the Ontario Drinking Water Quality Standards Aesthetic Objectives and Operational Guidelines.

Radiological parameters were screened for in all sampled monitoring wells during the first year (2023) of monitoring by analysis of gross alpha and beta radiation levels. These were compared to the Canadian Drinking Water Quality Guidelines of 0.5 and 1.0 becquerels per litre, respectively. Monitoring wells where gross alpha and / or beta levels exceeded the screening levels were further sampled in June 2024 for a set of

naturally occurring radionuclides. No exceedances of the individual radionuclide parameters were reported relative to the Canadian Drinking Water Quality Guidelines, Ontario Drinking Water Quality Standards, or Provincial Water Quality Objectives; however. some parameters had laboratory detection limits that were greater than the regulatory guidelines.

Low levels of polycyclic aromatic hydrocarbons (like naphthalene) and volatile organic compounds (like toluene, ethylbenzene, and xylene) have been detected at a few monitoring wells. All measured methylmercury concentrations were below applicable regulatory guidelines. It was also noted that many of the polycyclic aromatic hydrocarbon and volatile organic compounds detected in some groundwater samples were also occasionally detected in equipment blank and field blank samples.

8.1.7.5 Groundwater Quantity

Groundwater levels were previously reported from boreholes drilled along and near to the existing conditions Construction Disturbance Area for a transportation corridor study (Golder, 2013a). Grouped by surficial geology, the groundwater levels ranged from 0.2 to 3.5 metres deep in till and glaciomarine deposits, 1.5 to 4.5 metres deep in glaciofluvial ice-contact deposits and 0 to 2.0 metres deep in organic deposits.

Additional groundwater observations were made during preliminary geotechnical investigations for the Community Access Road. These observations, from test holes ranging from 0.5 to 3.4 metres in depth indicated that groundwater was observed at depths ranging from 0.1 to 1.8 metres and no groundwater was observed in some test holes up to greater than 3 metres in depth (KGS Group, 2020). These groundwater depth ranges indicate that across the study area, groundwater is consistently encountered within a few metres below the ground surface and can be found at ground surface in areas with organic deposits.

Overall, groundwater in the study area is typically found within a few metres below the ground surface and can be at the surface in areas with organic deposits. Groundwater usually flows through coarser materials like sand, with silty and clayey deposits restricting flow. In the Precambrian Shield region, groundwater also flows through shallow bedrock fractures.

Groundwater levels measured in the monitoring wells installed during the current program are provided in tabular format in Attachment F of the Groundwater Technical Support Document (**Appendix H**).

8.1.7.6 Geochemical Characterization

A geochemical characterization study was completed and included a review of existing information and field investigations, where 108 samples of geological materials were collected. These samples included 13 organic, 14 bedrock, and 81 soil samples. They were analyzed for various properties to determine their potential for acid rock drainage.

- Soil Samples: Most had low acid rock drainage potential, with only one sample being potentially acid generating;
- Organic Samples: Four out of 13 were potentially acid generating, while the rest were not; and
- Bedrock Samples: All but one were non-potentially acid generating. The exception was near borehole site MW22-16.

Leach testing showed that:

- Soil samples had elevated levels of fluoride and copper;
- Organic samples had elevated levels of boron; and
- Bedrock samples had elevated levels of silver, aluminum, and vanadium.

Only two potentially acid generating samples were from the Construction Disturbance Area, and further analysis showed they had no geochemical acid potential.

8.1.8 Peatlands

Peatland is a collective term for wetlands that accumulate more than 40 centimetres of organic soil (Asada and Warner, 2005; National Wetlands Working Group, 1988, 1997; Sims and Baldwin, 1996). Factors such as water availability, climate, elevation, and terrain play major roles in the development of peatland ecosystems. Bog, fen, organic marsh and organic swamp communities rely on stagnant to slow-moving water fed by groundwater, adjacent waterbodies, and / or precipitation, which allow peat to form by creating anoxic systems that slows the decomposition of dead plant material (Harenda et al., 2018).

Characterization of the existing peatland conditions was completed by undertaking a desktop background information review and desktop mapping exercise for the Community Access Road, supplemented by a multi-year field program to assess a subset of the peatland ecosites and to collect soil and botanical data to characterize peatland community composition in a subset of each ecosite type. Both the desktop review and field investigations for peatlands was completed in tandem with the vegetation field program.

Through desktop ecosite mapping and field verification, a total of 15 peatland ecosite types were identified within the existing conditions Local Study Area. The 15 peatland ecosite types were grouped into eight different peatland vegetation community groupings: treed bogs, open bogs, sparse treed fen, open fen, shore fen, organic conifer swamps, organic thicket swamp, and organic marsh. However, given the scale of the Community Access Road and the limitations identified in the desktop ecosite mapping exercise, ecosites have been rolled up into four peatland vegetation community groupings:

- Bog;
- Fen;
- Organic Marsh; and
- Organic Swamp.

Bogs are distinct from other peatland and wetland types by being hydrologically isolated systems (ombrotrophic) with precipitation acting as the only input source for both water and minerals. Bogs can exist in isolated depressions or in areas where the build up of organic material has led to the system being elevated above the surrounding vegetation communities and isolated from surface or groundwater sources (for example, a raised dome). These mineral deficient, and acidic systems are environments where plant growth is limited by excess moisture, low nutrient availability and pH (Banton et al., 2009).

Fens differ from bogs as they are minerotrophic systems predominately sustained by groundwater inputs, and to a lesser degree, surface water and groundwater inputs (Ducks Unlimited Canada, 2024). The diversity and composition of plant species in fens is largely dependent on the underlying hydrogeology, which dictates the nutrient availability in a system. Groundwater inputs can create nutrient rich systems compared with bogs. However, the nutrient status of fens can range from poor to rich. Poor fen ecosites are weakly minerotrophic peatlands that occasionally flood or have low groundwater movement and a rooting zone in contact with minerotrophic groundwater (Banton et al., 2009). Moderately rich fen ecosites have moderate nutrient availability, with periodic flooding, groundwater movement, and rooting zone in contact with mineral-rich groundwater (Banton et al., 2009). Extremely rich fen ecosites have high nutrient availability and are subject to periodic flooding and groundwater movement and a rooting zone in contact with mineral-rich groundwater; these communities are often patterned with alternating raised ridges (strings) and depressions (flarks) that form perpendicular to the flow of water (Banton et al., 2009). The pH of fen waters also varies along the poor-to-rich gradient. Poor fen systems are acidic systems (in other words, pH levels of 4.5 to 5.5), moderately rich fens are slightly acidic (in other words, pH levels of 5.5 to 6.9) and extremely rich fens are neutral to basic in nature with a pH above 6.9 (United States Department of Agriculture, no date).

Organic conifer swamp communities are found in areas that experience periodic flooding or increased groundwater inputs resulting in a large hydroperiod that provide varying levels of nutrient availability while allowing for the accumulation of organic material (Banton et al., 2009). Like fens, organic swamps can be poor, intermediate, or rich in their nutrient availability, which influences their vegetation composition (Banton et al., 2009).

Organic marsh communities are considered nutrient rich, receiving nutrients from persistent groundwater inputs and periodic or sustained inputs from adjacent watercourses or waterbodies. Fluctuating water levels leading to exposure of the soils also lead to aeration of the substrate. Organic meadow marshes have high nutrient availability and are often situated adjacent to a lake or stream, where water is normally above the substrate surface, often forming because of a break in a beaver dam.

8.1.8.1 Availability

The availability (in other words, area) of the four wetland vegetation groupings within the existing conditions Local and Regional Study Areas based on the desktop mapping exercise is summarized in **Table 8.1-13** and illustrated on **Figure 8.1-7**.

Table 8.1-13: Peatland Vegetation Groupings in the Existing Conditions Study Areas

Peatland Vegetation Group	Area of Each Peatland Vegetation Group in the Local Study Area (hectares) (Footnote a)	Percent of Each Peatland Vegetation Group in the Local Study Area	Area of Each Peatland Vegetation Group in the Regional Study Area (hectares)	Percent of Each Peatland Vegetation Group in the Regional Study Area
Bog	2,172.0	Less than 2	184,580.7	17
Fen	74,068.7	37	244,992.8	22
Organic Marsh	2,407.2	Less than 2	3,927.4	Less than 1
Organic Swamp	45,327.9	23	280,044.6	25
Total	**123,975.8**	**63**	**713,545.5**	**64**

Footnotes: Totals may vary slightly due to rounding.

(a) Wetland area values within the existing conditions Regional Study Area represent a combination of area values from delineated peatland communities completed for the Project within the existing conditions Local Study Area, and Ontario Land Cover Compilation Version 2.0 mapping for areas beyond the limits of the existing conditions Local Study Area. The Ontario Land Cover Compilation layer is a compilation of Far North Land Cover version 1.4, Southern Ontario Land Resource Information System version 1.2, and Provincial Land Cover 2000 Edition. The Ontario Land Cover mapping does not differentiate between organic and mineral wetland communities.

Figure 8.1-7: Existing Conditions: Wetland and Upland Ecosystems

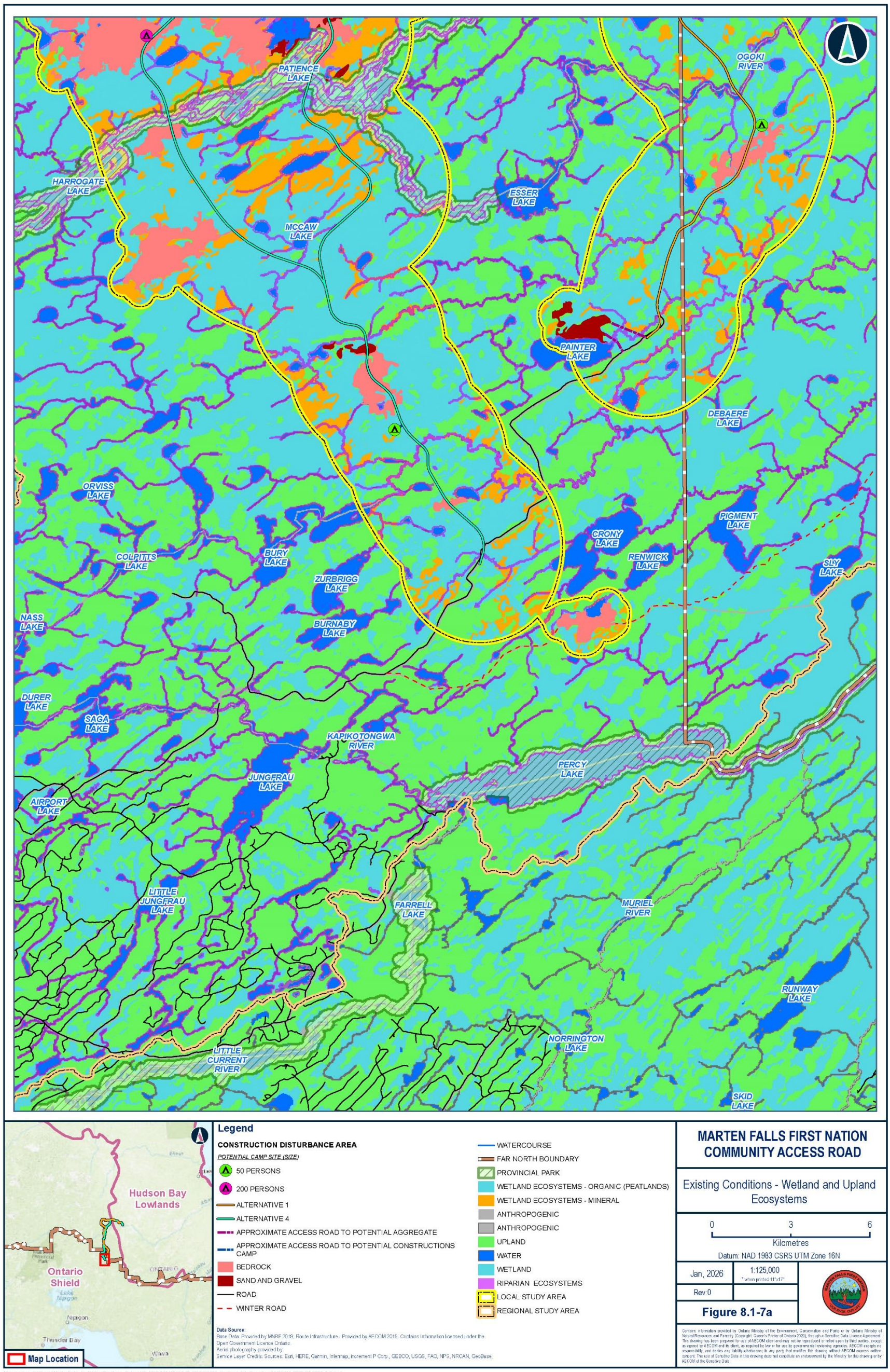


Figure 8.1-7b: Existing Conditions: Wetland and Upland Ecosystems

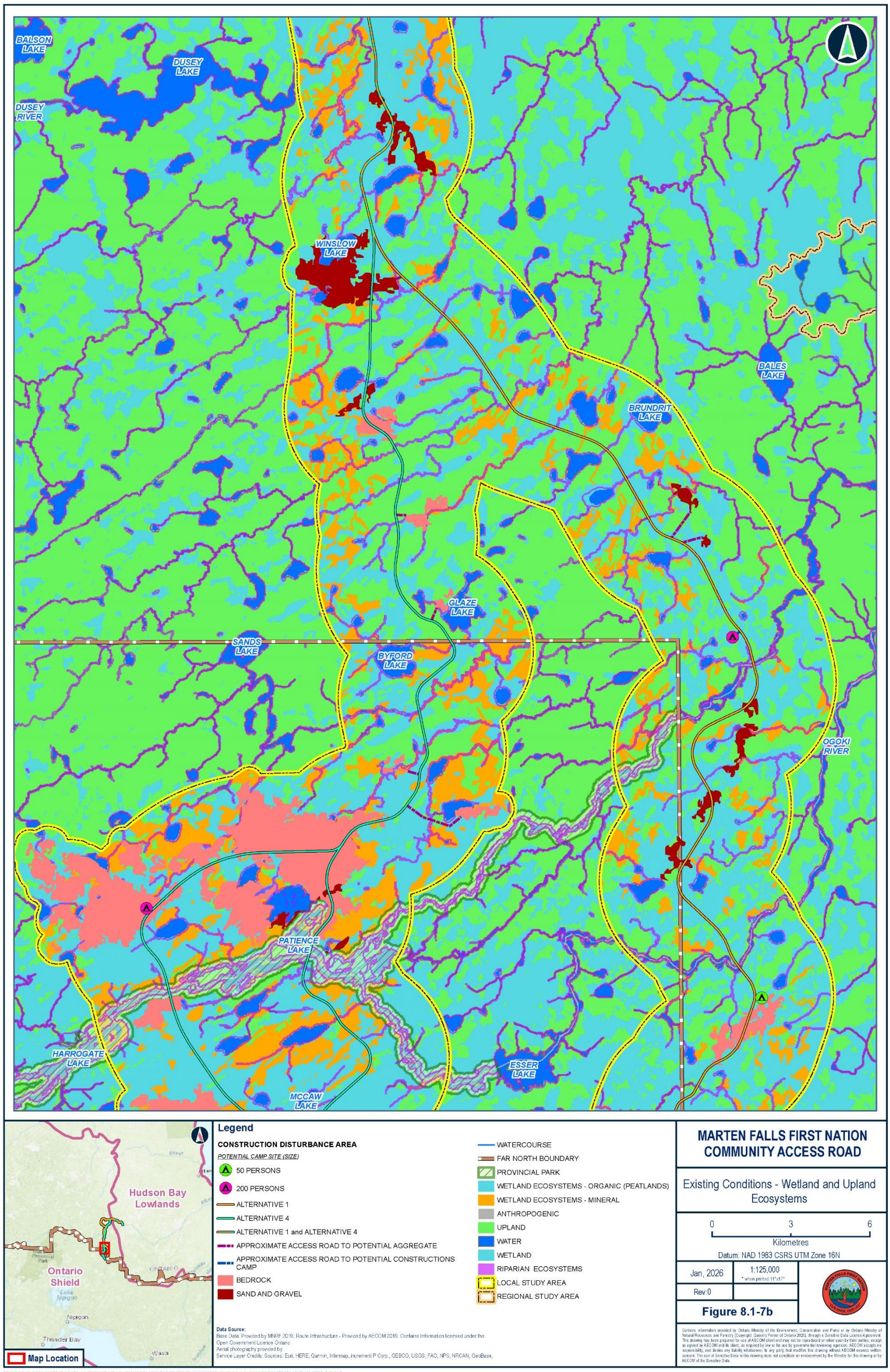


Figure 8.1-7c: Existing Conditions: Wetland and Upland Ecosystems

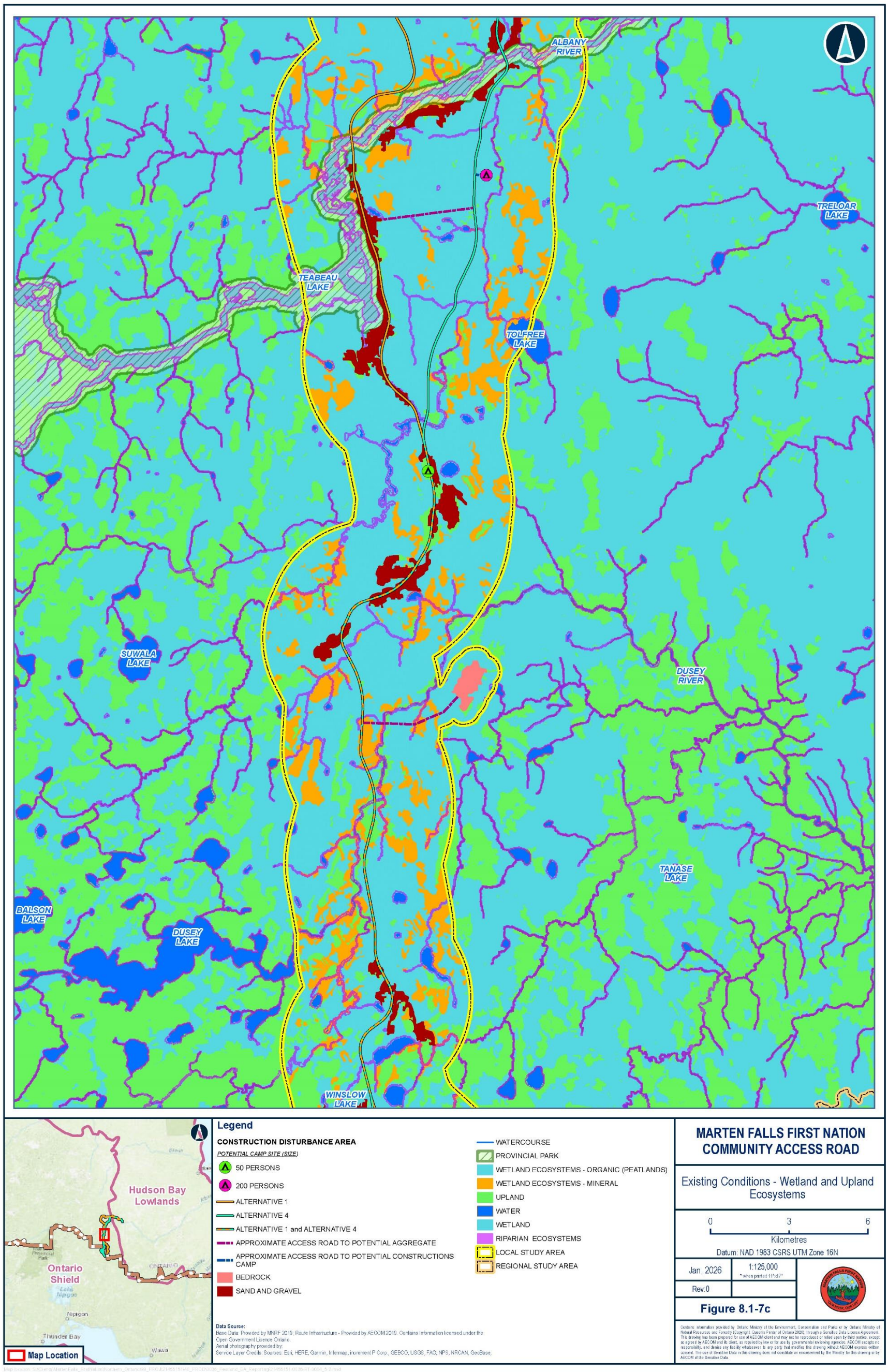


Figure 8.1-7d: Existing Conditions: Wetland and Upland Ecosystems

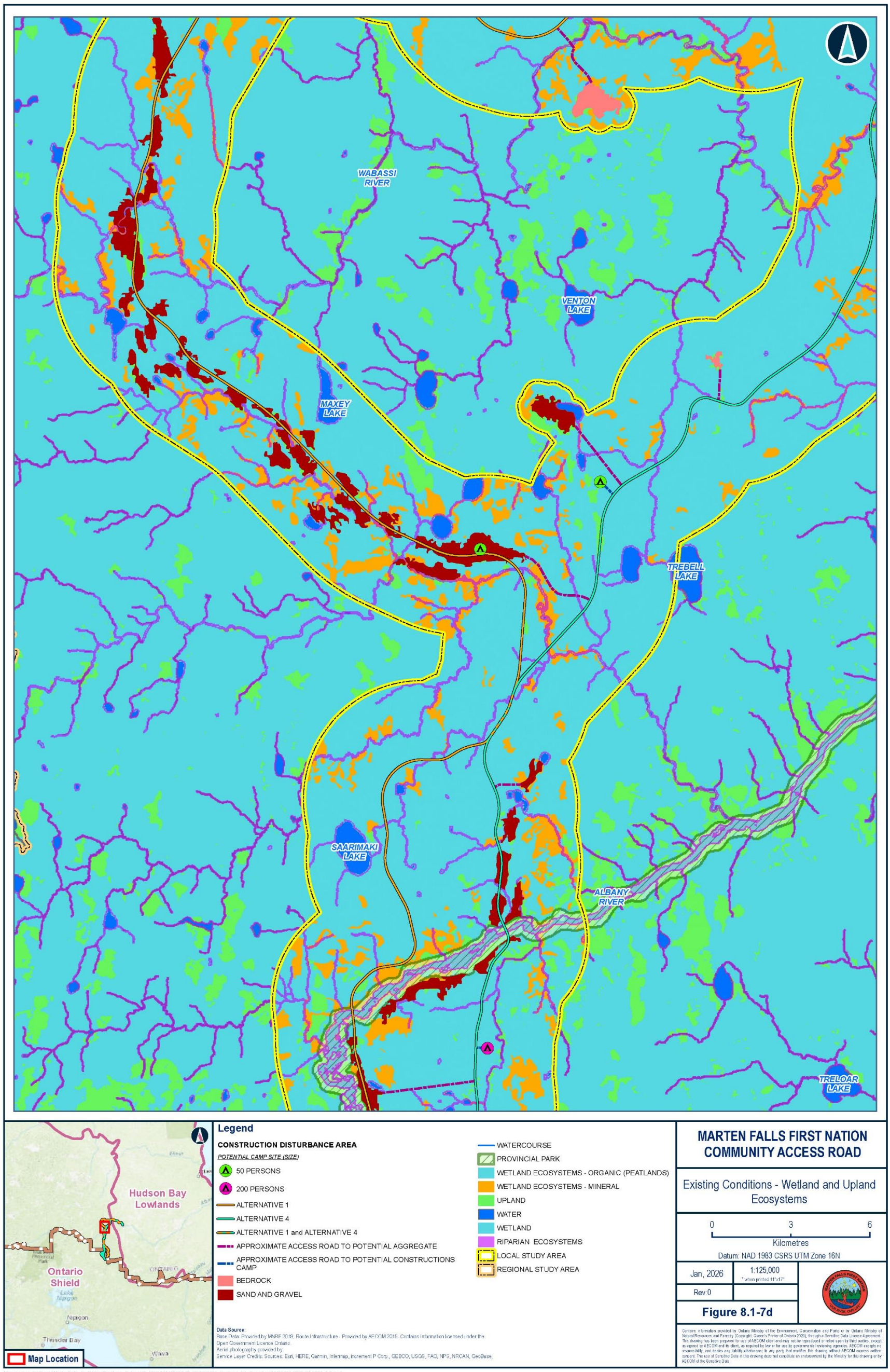


Figure 8.1-7e: Existing Conditions: Wetland and Upland Ecosystems

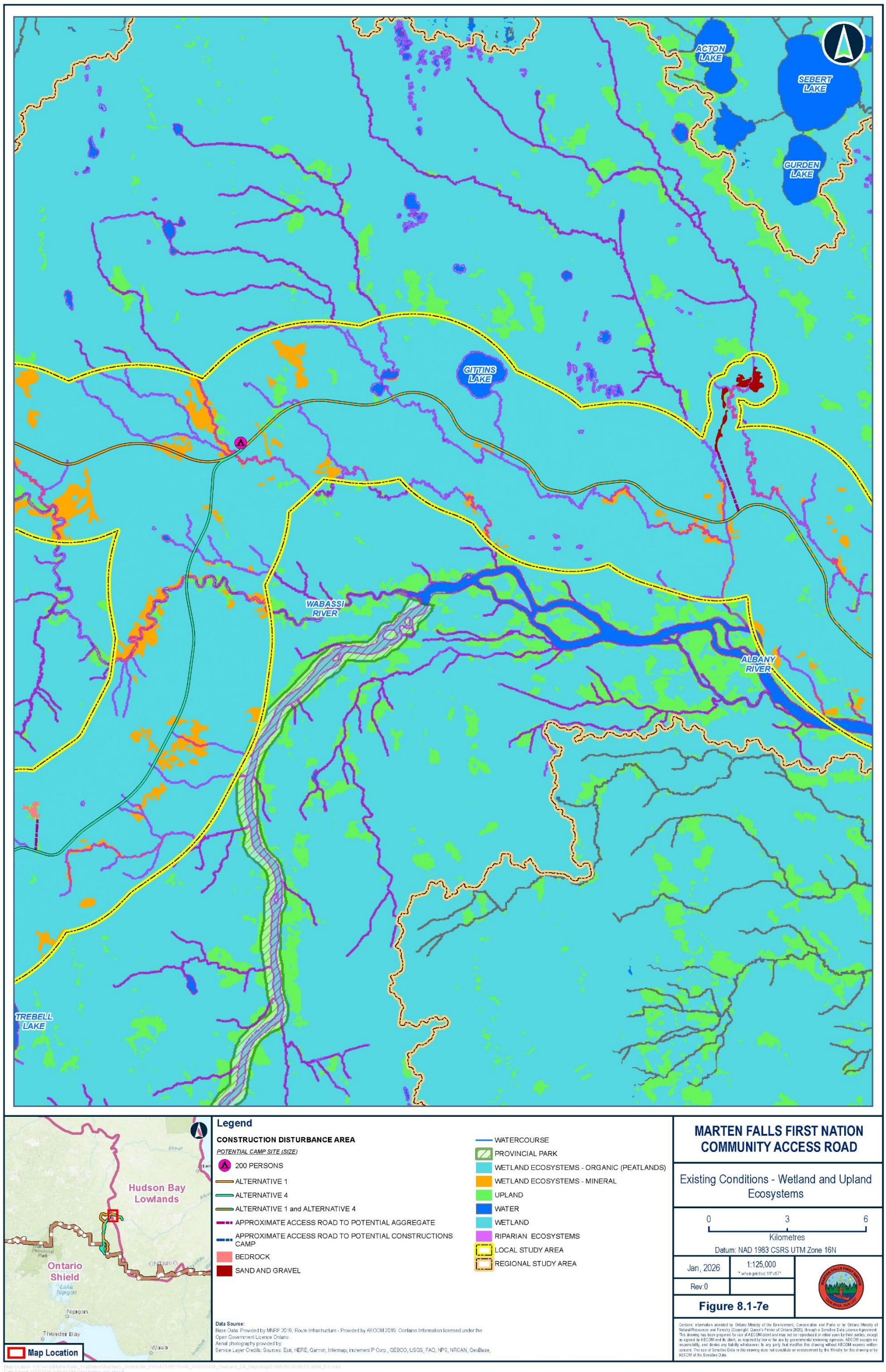
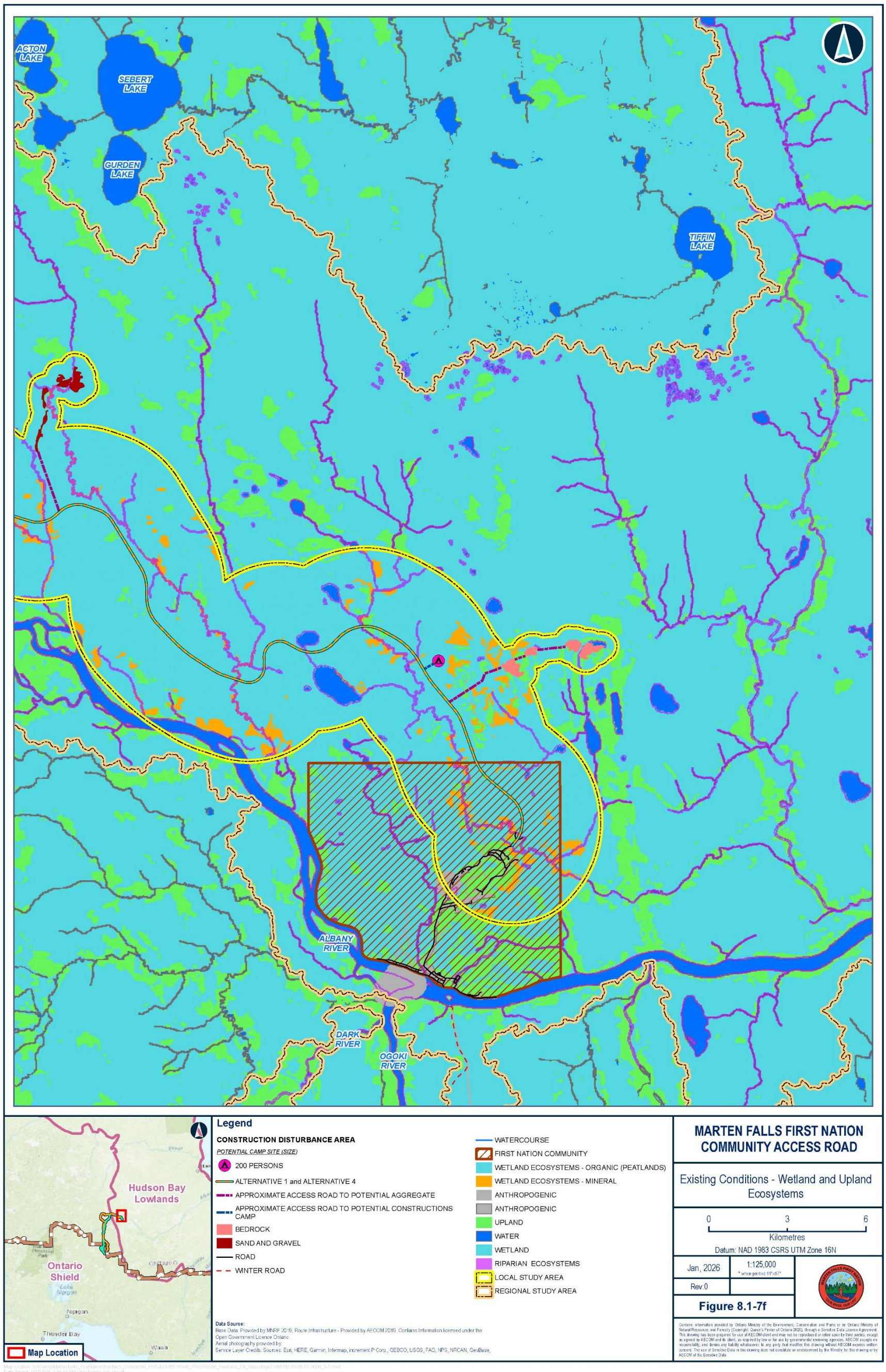


Figure 8.1-7f: Existing Conditions: Wetland and Upland Ecosystems



Fen communities are the most common wetland and peatland community types mapped within the existing conditions Local Study Area. The mapped fen communities comprise 37 percent of the existing conditions Local Study Area and 22 percent of the existing conditions Regional Study Area. Organic swamp communities are the next most abundant wetland community type mapped in the existing conditions Local Study Area. Organic swamps comprise 23 percent of the existing conditions Local Study Area and organic swamp communities comprise 25 percent of the existing conditions Regional Study Area. Both organic marsh and bog communities comprise less than 4 percent of the existing conditions Local Study Area and less than 18 percent of the existing conditions Regional Study Area.

The mapped wetland vegetation cover within the existing conditions Local Study Area is generally representative of the Peatlands of Canada mapping described above and the Ecoregions 2E (James Bay) and 2W (Big Trout Lake) vegetation cover described in The Ecosystems of Ontario, Part 1: Ecozones and Ecoregions (Crins et al., 2009) with the exception of bog cover, which is lower than what has been estimated across the general landscape in those ecoregions. Ecoregion 2E is reported to be dominated by fen (29.6 percent) and bog (38.9 percent) communities, while Ecoregion 2W has a greater proportion of upland forest (49.2 percent) (Crins et al., 2009).

8.1.8.2 Distribution

The distribution of peatland ecosystems within the existing conditions Local Study Area is illustrated on **Figure 8.1-7** and **Figure 8.1-8**. Generally, peatland ecosystems are more frequent in the northern portion of the existing conditions Local Study Area, north of Dusey Lake, as can be seen by the dominance of light blue shading on **Figure 8.1-7, plates 3 through 7**. Likewise, fen and swamp communities are most common in the northern portion of the existing conditions Local Study Area (**Figure 8.1-8, plates 3 through 7**). The northern portion of the existing conditions Local Study Area is characteristic of Ecodistricts 2W-2 and 2E1 which are both dominated by wetlands on organic substrates (Wester et al., 2018).

Input from Marten Falls First Nation has included information about the distribution of peatland environments within the Local and Regional Study Areas. In particular, the Community has noted a large expanse of peatlands and felled trees within the lands between the southern channel of the Albany River to the Pahtegosing River (Marten Falls First Nation, 2023b).

Figure 8.1-8: Existing Conditions – Peatland Community Types in the Local and Regional Study Areas

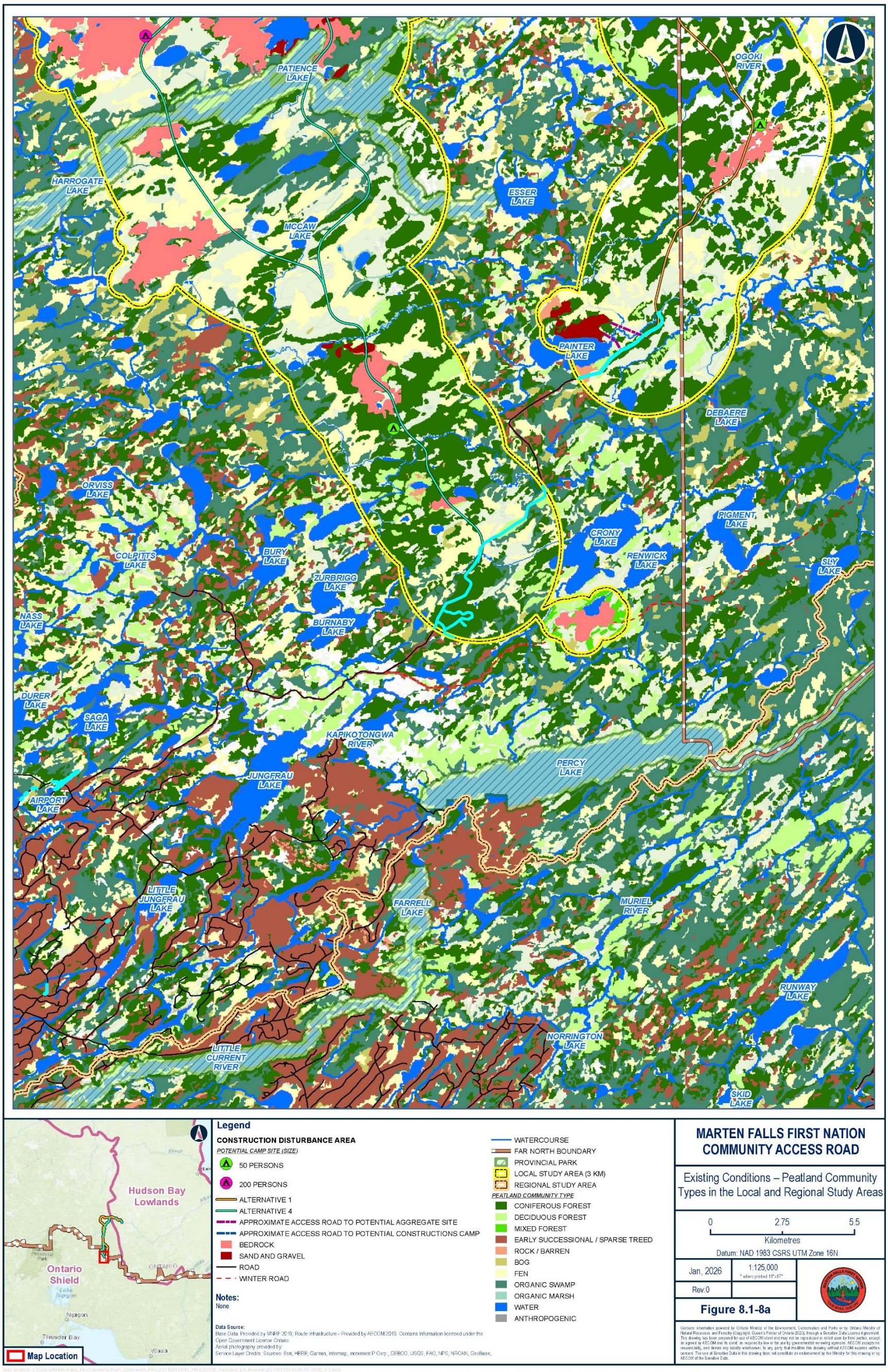


Figure 8.1-8b: Existing Conditions – Peatland Community Types in the Local and Regional Study Areas

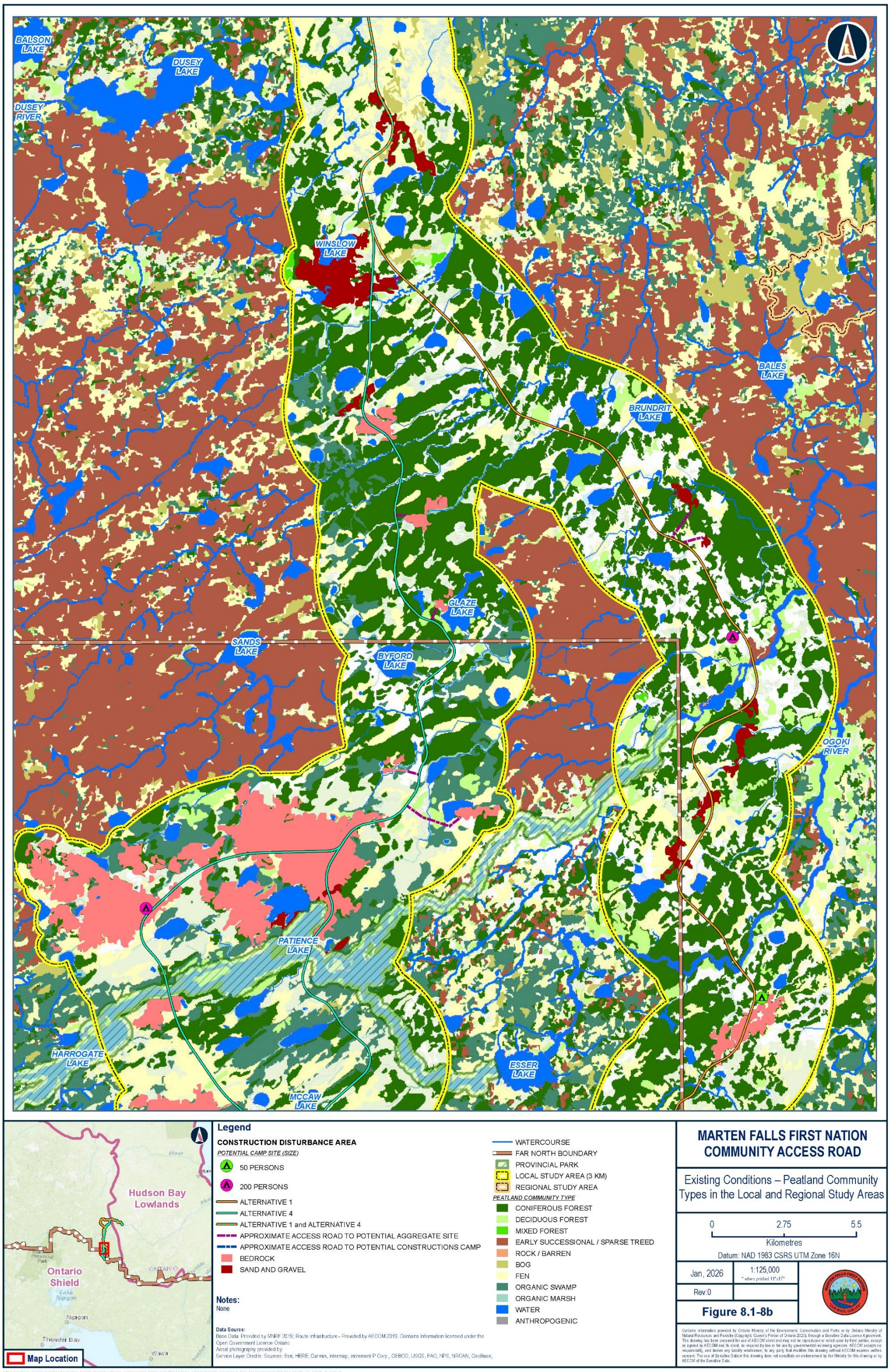


Figure 8.1-8c: Existing Conditions – Peatland Community Types in the Local and Regional Study Areas

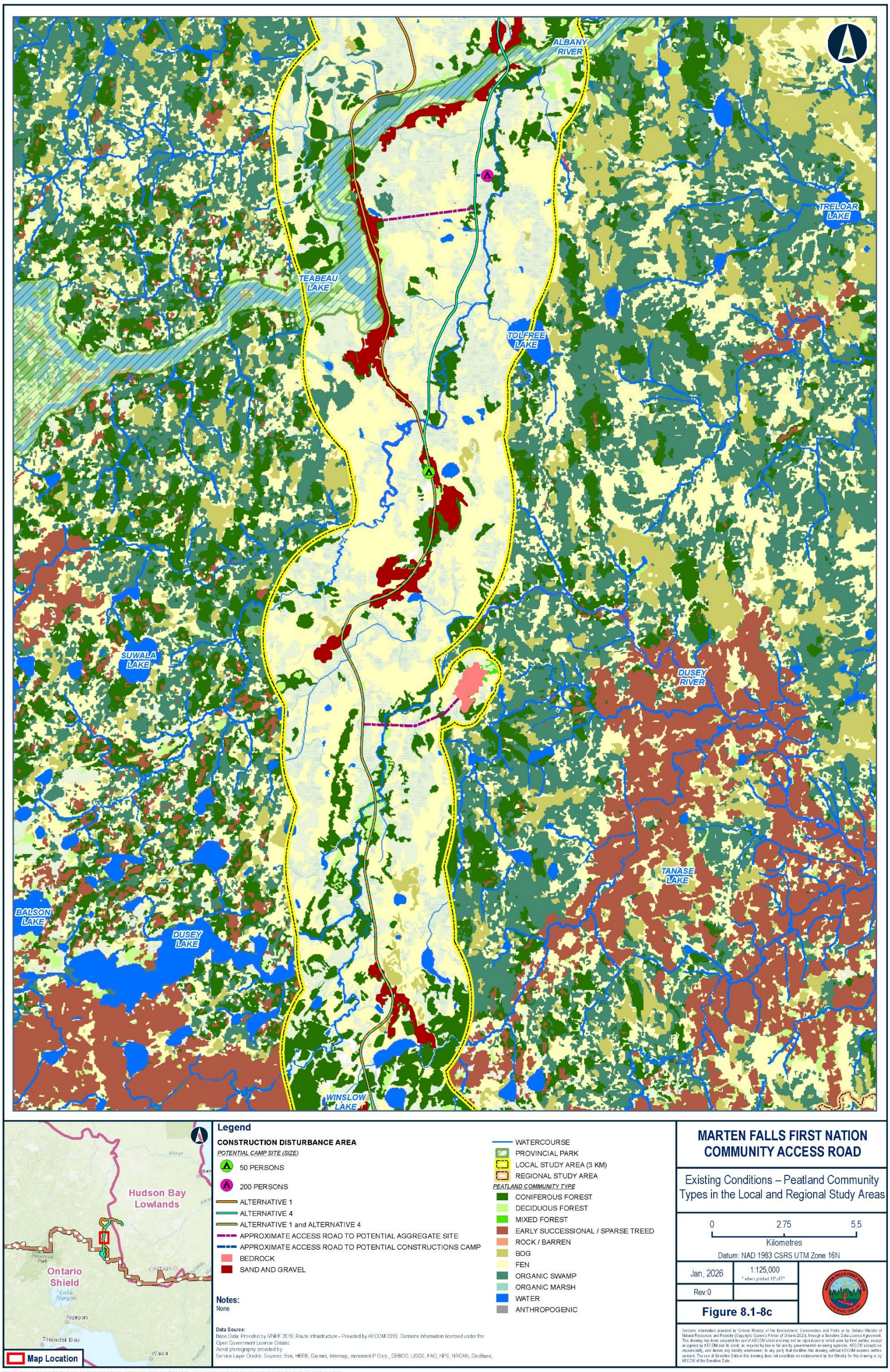


Figure 8.1-8d: Existing Conditions – Peatland Community Types in the Local and Regional Study Areas

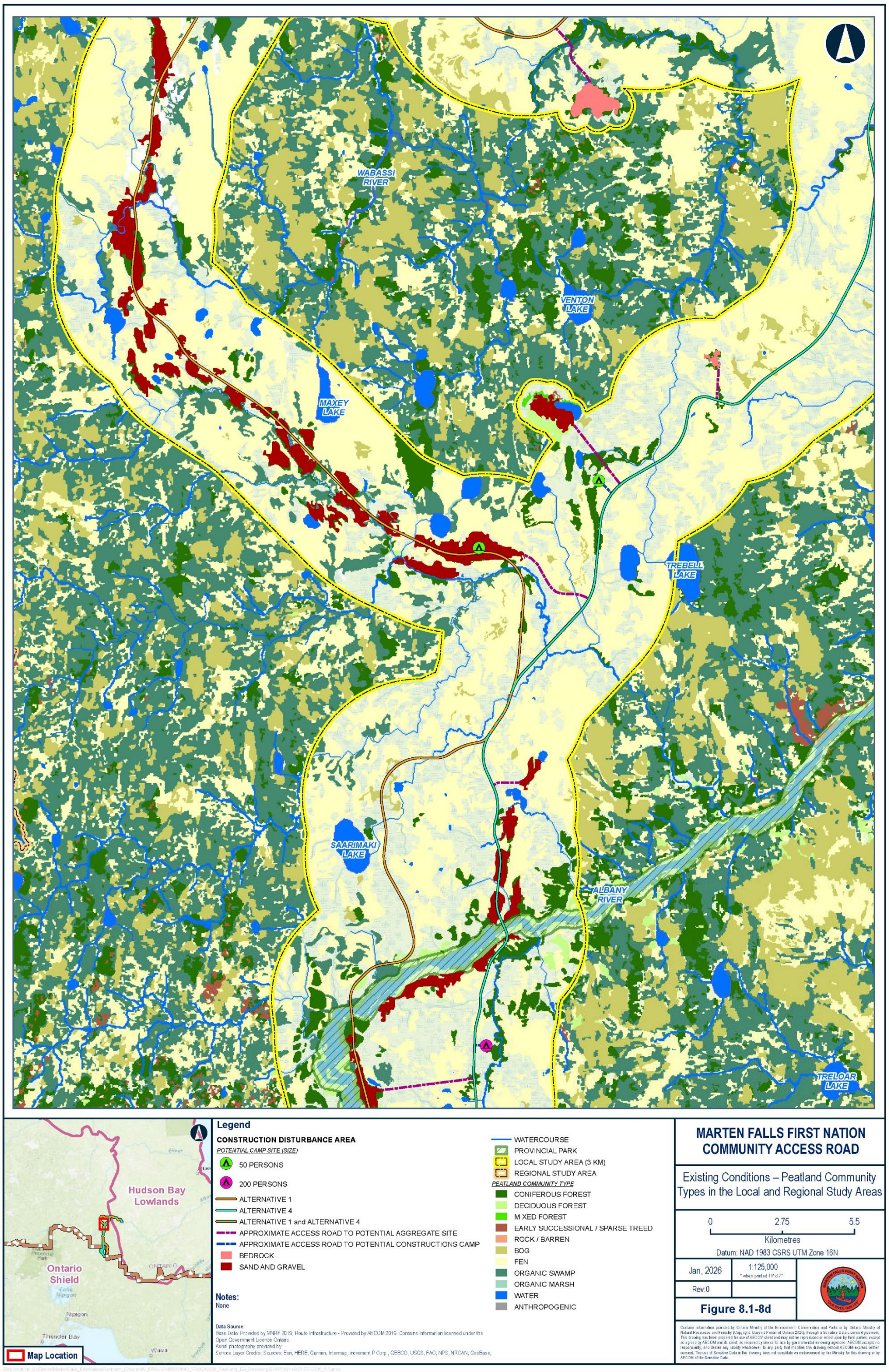


Figure 8.1-8e: Existing Conditions – Peatland Community Types in the Local and Regional Study Areas

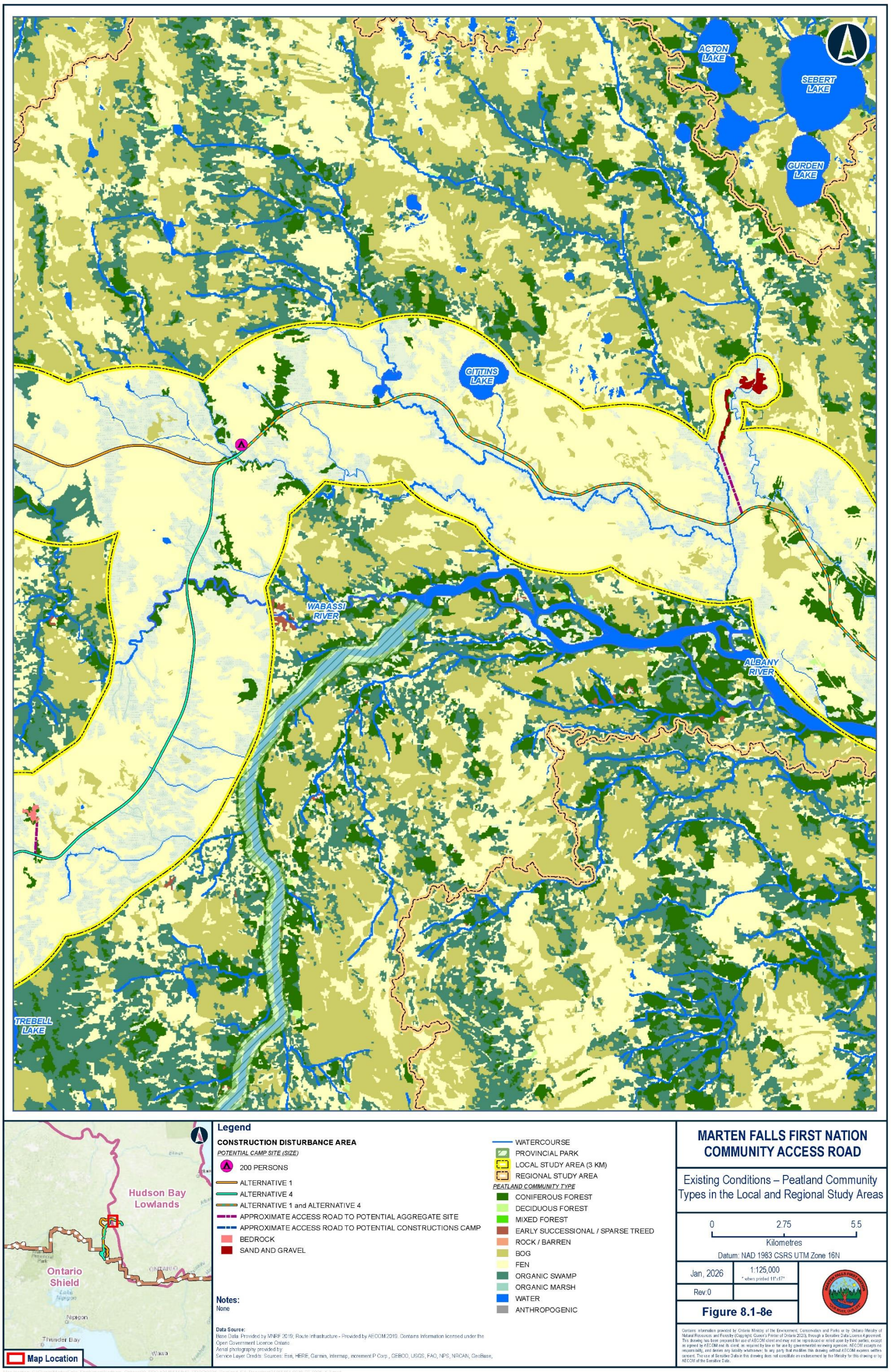
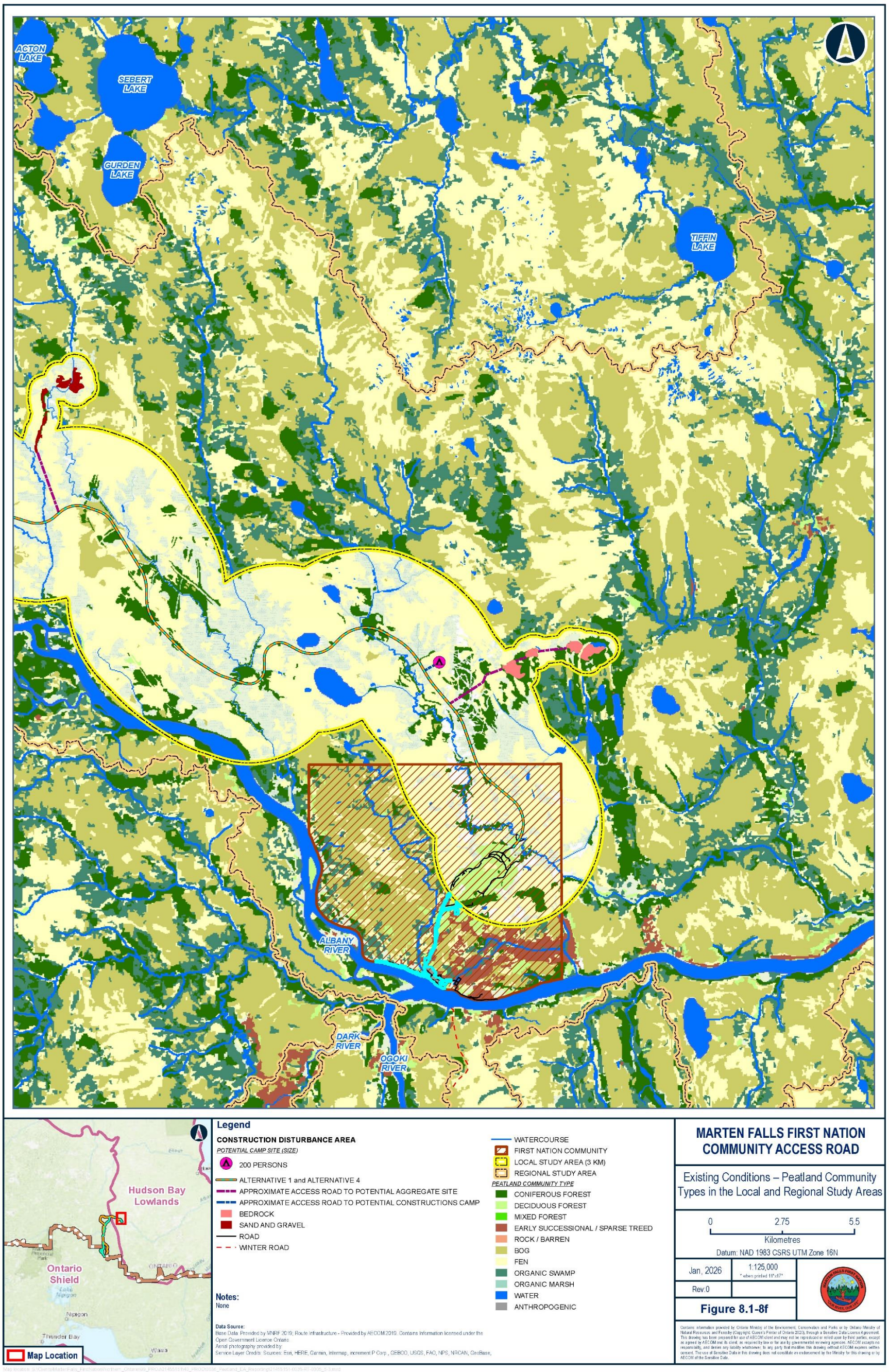


Figure 8.1-8f: Existing Conditions – Peatland Community Types in the Local and Regional Study Areas



Although human development activities that typically fragment the landscape in southern Ontario (for example, road, rail, and other linear infrastructure; agriculture; and land development) are absent from the majority of the Project study areas, some forestry operations, camps, communities, and road development are present towards the southern limits of the existing conditions Local Study Area, as well as associated with the First Nation community at the northern-most limit of the existing conditions Local Study Area. This has resulted in some limited fragmentation of the landscape. Otherwise, the landscape has generally remained intact, influenced primarily by natural disturbances (for example, fire). A summary of disturbance analyses (including fire and harvest disturbance data) within wetlands is presented in the Vegetation Technical Support Document (**Appendix J**).

8.1.8.3 Composition

Through the desktop ecosite mapping and field verification, a total of 15 peatland ecosite types were identified within the Local Study Area. Given the scale of the Community Access Road and the limitations identified in the desktop mapping exercise, for mapping and analyses purposes, ecosites have been rolled up into four wetland types in the Regional Study Area and the following eight peatland vegetation community groupings in the Local Study Area. The rolled-up peatland vegetation groupings are presented on **Figure 8.1-8** and in **Table 8.1-14**:

- Sparse treed fen (B136Tl / B136Tt);
- Open fens (B139N / B139S, B140N / B140S, B141N / B141S);
- Shore fens (B146N / B146S, B147N / B147S);
- Treed bogs (B126Tl / B126Tt, B137Tl / B137Tt);
- Open bogs (B138N);
- Organic conifer swamps (B127Tl / B127Tt, B128Tl / B128Tt, B129Tl / B129Tt);
- Organic thicket swamps (B135S); and
- Organic marshes (B144N, B149N).

Table 8.1-14: Summary of Wetland Functions in the Existing Conditions Study Areas

Function Category	Function	Description	Function Performance by Wetland Community Type			
			Swamp	Marsh	Fen	Bog
Hydrological	Water storage	Storage of surface water, both short- and long-term. Capacity depends on wetland location within the landscape, size, and normal water level. May contribute to maintenance of base flows and seasonal flow distribution	Low to High	Low to High	Moderate	Low
	Groundwater recharge	Dependent on location within the landscape and watershed, as well as local groundwater gradients	Low	Variable	Variable	Variable
	Local climate regulation	Evapotranspiration rates provided by emergent herbaceous plants, mosses and shrubs	Moderate	High	Moderate	Low
Biogeochemical / Climate	Water quality treatment	Treatment of physical, chemical and biological inputs. Dependent on loading rates, hydroperiod, substrate and vegetation assemblage. Possible benefits for downstream aquatic life (for example, fish)	High	High	High	Low
	Nutrient / organic export	Export of nutrients and organic carbon to streams may influence bacteria growth and can affect the aquatic food chain	Variable	Variable	High	Variable
	Carbon sequestration / storage	Related to the volume of peat, as well as woody and acidic biomass	Moderate to High	Moderate to High	High	High
Habitat	Biodiversity and biological productivity	Habitat for wildlife or significant species, such as Species at Risk, rare species, commercially or traditionally valued species	High	Moderate to High	Moderate to High	Moderate
		Habitat for significant vegetation species, such as Species at Risk, rare species, or traditionally valued species	High	Moderate	High	Moderate

The greatest proportion of the peatland ecosites within the Local Study Area are composed of fen and swamp communities, and specifically, treed fen and organic conifer swamp ecosites. The following is a summary of the peatland ecosystems within the Local Study Area:

- Peatlands comprise 62.6 percent of the Local Study Area;
- Fen ecosites 73,917 hectares or 37.4 percent of the Local Study Area which represents 51 percent of the peatland ecosystems:
  - The majority of the fen ecosites are mapped as Sparse Treed Fen (B136Tl / B136Tt), representing 34.1 percent of the Local Study Area;
  - The second most common fen ecosites are Open Fens, including Poor Fen (B139N / B139S), Open Moderately Rich Fen (B140N / B140S), and Open Extremely Rich Fen (B141N / B141S) together representing 3.1 percent of the Local Study Area; and
  - The third most common fen ecosites are Shore Fens, including Open Shore Fen (B146N / B146S) and Shrub Shore Fen (B147S), together representing 0.2 percent of the Local Study Area.
- Organic swamp ecosites comprise 45,386.6 hectares or 23 percent of the Local Study Area, which represents 31.3 percent of the peatland ecosystems:
  - The majority of the organic swamp ecosites are mapped as organic conifer swamps, including organic poor conifer swamp (B127Tl / B127Tt), organic intermediate conifer swamp (B128Tl / B128Tt), and organic rich conifer swamp (B129Tl / B129Tt), together representing 22.7 percent of the Local Study Area; and
  - The second most common organic swamp ecosites are mapped as organic thicket swamp (B135S), representing only 0.2 percent of the Local Study Area.
- Organic marsh ecosites mapped as organic meadow marsh (B144N) and organic shalllow marsh (B149N), together represent 1.2 percent of the Local Study Area which represents 1.7 percent of the peatland ecosystems; and
- Bog ecosites comprise only 1.1 percent of the Local Study Area, which represents 1.6 percent of the wetland ecosystems.
  - Treed bog (B126Tl / B126 Tt and B137Tl / B137Tt) are the most common bog ecosites, representing 1 percent of the Local Study Area; and
  - Open bog (B138N) represents 0.01 percent of the Local Study Area.

8.1.8.4 Function

Wetlands, including peatland ecosystems in the existing conditions Local Study Area and Regional Study Area, provide a range of functions that are categorized as hydrological, biogeochemical or habitat. The ability of each peatland vegetation community (in other words, organic swamp, organic marsh, fen, and bog) to perform the associated function varies depending on characteristics such as landscape position (for example, riparian and basin), depth of organics, and size. The relative importance of each function also varies and may be related to the type and proximity of other vegetation communities. A summary of wetland (including peatland) functions, as well as a general classification of the level of performance by each wetland vegetation community, is provided in **Table 8.1-14** (Hanson et al., 2008; Committee on Characterization of Wetlands et al., 1995; Ducks Unlimited Canada, 2018).

8.1.8.4.1 Hydrological

The subdued topography and large, flat basin play an important role in creating and maintaining peatland systems by providing areas where vegetation is in a continuously waterlogged state, slowing down the decomposition of organic matter by inhibiting oxidation and allowing the organic matter to build up over time as peat (Craft, 2022). A peatland's position in the landscape and its connection to adjacent surface water and groundwater inputs and outputs largely drives its form and function. Ongoing groundwater inputs mean fens are less dependent on surface inputs compared to other wetland types which helps to stabilize a fen systems water table throughout the year (Price et al., 2023). Swamps are characterized by fluctuating water levels influenced by surface runoff, precipitation, and / or groundwater resulting in standing or flowing water that may be seasonal with systems experiencing a large decrease in their water table during drier seasons or persisting for longer periods depending on the source of water and rate of transpiration from the local vegetation (Ministry of Natural Resources and Forestry, 2022; Price et al., 2023). Given the topographic and groundwater conditions of the existing conditions Local Study Area, it is not surprising that these two peatland community types are the most common in the landscape.

Indigenous communities including Fort Albany First Nation have also highlighted observations relating to the role of peatlands in hydrological function, noting the overall importance of peatland systems in relation to water storage, filtration, streamflow, and groundwater conditions throughout seasonal cycles (Firelight Research Inc., 2024).

Peatlands, such as raised bogs, rely mainly on rain and snowmelt to keep water moving through the soil. When evaporation is greater than rainfall, water can move upward from

deeper layers to keep the peat moist. This process helps peatlands stay waterlogged, allowing peat to build up and store carbon. Large rainfall or melt events also benefit nearby rivers and lakes by maintaining flows, supporting groundwater systems, and reducing erosion during high-water periods. Because the wetlands in this area form a large, connected system, they have a large capacity to store water. Groundwater recharge mostly happens in the southern part of the Local Study Area where soils are more permeable and wetlands are fewer. In contrast, the northern Local Study Area has more organic soils with poor drainage, meaning wetlands there contribute little to groundwater recharge.

8.1.8.4.2 Biogeochemical

Peatlands play an important role in creating suitable conditions for biogeochemical cycling, or transformation of nutrients, especially of nitrogen, carbon, and phosphorus (United States Environmental Protection Agency, 2016). Peatlands filter the water that passes through, trapping suspended sediment and retaining or processing inorganic nutrients and organic wastes. This filter function improves downstream water quality and protects aquatic habitats from degradation associated with nutrient loading, such as algal blooms, dead zones and fish kills (United States Environmental Protection Agency, 2016).

Both fens and organic swamps have the potential to perform these biogeochemical functions at a high rate due to a combination of physical processes, high interaction between water and root-bacteria assemblages, flow through substrate and heterogeneity in oxidation. Fens and swamps may act as a sink for nutrients, reducing export to downstream environments. Performance is dependent on inflow and outflow, loading rates and the constituents of concern (Hanson et al., 2008). In general, the landscape is characterized as relatively undisturbed with low anthropogenic inputs (for example, agricultural runoff and industrial or wastewater discharge). Therefore, sediment and nutrient loading in the existing conditions Local and Regional Study Areas are considered to be low.

Factors such as climate change are expected to have an impact on the ability of peatlands to sequester carbon in the future. Increases in global temperatures can cause drier conditions in the upper layers of peat, triggering increases in microbial decomposition rates in boreal environments, which in turn leads to increased release of carbon emissions from peatland environments (Ofiti et al., 2023). Under this scenario, peatland features that were once considered carbon sinks could start to act more like pools where carbon is readily released back into the atmosphere (Loisel et al., 2021).

Additionally, climate change and the drying of peat could lead to an increase in microbial activity and the breakdown of organic material, which could also increase production of methylmercury and inorganic mercury concentrations in boreal peatlands (Sun et al., 2023). However, this does not necessarily translate to increased levels of methylmercury export to downstream sources as drier conditions may lead to decreased discharge from peatlands and therefore a decrease in potential inputs of methylmercury to downstream receiving watercourses and waterbodies (McCarter et al., 2024).

8.1.8.4.3 Habitat

Given the abundance of peatlands in the overall landscape, their hydrology, and their limited nutrient availability compared to mineral wetland and upland environments, peatlands provide general and specific habitat conditions for a variety of plant and wildlife species within the existing conditions Local and Regional Study Areas. Habitat functions for vegetation and wildlife are summarized at a high-level in **Table 8.1-15**.

In general, swamps were assessed to support the highest diversity of wildlife in the existing conditions Study Areas. Swamps have higher structural complexity (in other words, different vegetation layers, such as canopy, subcanopy, shrub, and groundcover) and a greater variety of microhabitats than the other wetland types, which are more homogenous. Bogs tend to have the simplest habitat structure and support a less diverse wildlife community. However, the habitat functions they do support can be very specialized and represent important habitat in the landscape, such as for caribou.

8.1.8.4.3.1 Vegetation

- Given their abundance on the landscape, peatlands provide general habitat conditions for a large number of species within the existing conditions Local Study Area while their unique characteristics, including hydrology and nutrient availability, provide niche habitat conditions for species that have evolved to only be found in peatland environments (Antala et al., 2022);
- A total of 193 plant species were recorded in peatland communities during the vegetation field investigations completed between 2020 and 2023 (**Appendix J**);
- Two plant species that are Species at Risk and Species of Conservation Concern valued components in **Appendix J** are found in peatland environments: Black Ash (Oji-Cree translation, agimagwatik) (Fraxinus nigra) and Northern Marsh Violet (Oji-Cree translation, gaamiskwaadoogaag waabigwanii) (Viola epipsila); and

- Of the 43 plants identified as traditional use plants and plants of importance to Indigenous communities, 39 are known to be found in peatland communities or were found in peatland communities during vegetation field investigations. Traditional use plant species and species of importance to Indigenous communities were identified through a review of desktop resources and Indigenous Knowledge provided by the Eabametoong First Nation, Marten Falls First Nation, and Aroland First Nation. Traditional use plant species associated with peatlands are listed in **Table 8.1-16** (**Appendix J**).

Table 8.1-15 provides a summary of species that are associated with peatland vegetation communities and have been identified as valued components or proxy valued components in the various Technical Support Documents. Habitat functional performance was qualitatively assessed by habitat using the habitat preferences of each species summarized in their respective technical discipline reports which also incorporates any received Indigenous Knowledge.

Table 8.1-15: Summary of Habitat Functions by Wetland Community Type in the Existing Conditions Local and Regional Study Areas

Function Category	Wildlife Valued Component	Function Performance by Wetland Community Type			
		Swamp	Marsh	Fen	Bog
Habitat	Wetland Birds (including Species at Risk)	Moderate	High	High	Low
	Caribou	Moderate	Low	High	High
	Moose	High	Moderate	Moderate	Low
	Beaver	Low	High	High	Low
	Amphibians	High	High	High	High
	Bats	High	Low	Low	Low
	Marten	High	Low	Low	Low
	Wolverine	High	High	High	Moderate
	Overall	**High**	**Moderate to High**	**Moderate to High**	**Low**

Table 8.1-16 lists the traditional use plant species that were assessed in the Vegetation Technical Support Document (**Appendix J**) and are associated with peatland vegetation types.

Table 8.1-16: Traditional Use Plants Associated with Peatland Vegetation Community Types

Common Name	Oji-Cree Name	Scientific Name	Peatland Habitat	Traditional Use Category
Alpine Bilberry / Bog Bilberry	Nikeminan	Vaccinium uliginosum	Bog, Fen, Swamp	Food
American Sweetflag	Unknown	Acorus americanus	Marsh	Medicinal
Muskrat Root (Sweet Flag)	Wiikenh	Acorus calamus	Marsh	Unknown
Arrowhead	Unknown	Sagittaria sp.	Marsh, Swamp	Unknown
Aspen	Unknown	Populus sp.	Swamp	Unknown
Balsam Fir	Zhingobaandag (Eabametoong First Nation) Ini'naandag (Marten Falls First Nation)	Abies balsamea	Bog, Fen, Swamp	Home uses
Balsam Poplar	Maan azaadii	Populus balsamifera	Fen, Swamp	Unknown
Black Crowberry	Unknown	Empetrum nigrum	Swamp	Unknown
Black Spruce	Mina'ig (Eabametoong First Nation) Shikobaatik (Marten Falls First Nation)	Picea mariana	Bog, Fen, Marsh, Swamp	Home uses
Blue Flag	Unknown	Iris versicolor	Fen, Marsh, Swamp	Medicinal
Bog Goldenrod	Unknown	Solidago uliginosa	Bog, Fen, Marsh, Swamp	Medicinal
Broad-leaved Cattail	Paskakannoog	Typha latifolia	Fen, Marsh, Swamp	Home uses
Bunchberry	Shashagoominan (Eabametoong First Nation) Shashakominaan (Marten Falls First Nation)	Cornus canadensis	Bog, Fen, Swamp	Food
Caribou / Reindeer Lichen	Wabakamik	Cladonia rangiferina	Bog, Fen, Marsh, Swamp	Unknown
Cloudberry	Machakotominun	Rubus chamaemorus	Bog, Fen, Marsh, Swamp	Food; Medicinal
Common Bearberry	Makoominan	Arctostaphylos uva-ursi	Bog, Fen, Swamp	Medicinal
Cottongrass	Unknown	Eriophorum sp.	Bog, Fen, Marsh, Swamp	Unknown
Creeping Snowberry	Kinabik (Eabametoong First Nation) Wabiminaan (Marten Falls First Nation)	Gaultheria hispidula	Bog, Fen, Marsh, Swamp	Food; Medicinal
Dwarf Birch	Unknown	Betula nana	Bog, Fen, Marsh, Swamp	Unknown
Eastern White Cedar	Giishkaatig	Thuja occidentalis	Fen, Marsh, Swamp	Medicinal; Spiritual
Fireweed	Awihkabigwaan	Chamaenerion angustifolium	Bog, Fen, Swamp	Medicinal
Highbush Cranberry	Zhikwako Minik	Viburnum opulus	Fen, Swamp	Medicinal
Jack Pine	Okikaandaag	Pinus banksiana	Bog, Fen, Swamp	Food
Labrador Tea	Kakekaybegoon	Rhododendron groenlandicum or Ledum groenlandicum	Bog, Fen, Swamp	Food; Medicinal; Spiritual
Lowbush Cranberry	Unknown	Vaccinium vitis-idaea	Bog, Fen, Marsh, Swamp	Unknown
Narrow-leaved Cottongrass	Unknown	Eriophorum angustifolium	Bog, Fen, Marsh, Swamp	Unknown
Northern Black Currant	Maanatoominan	Ribes hudsonianum	Swamp	Food
Northern Labrador Tea	Unknown	Rhododendron tomentosum	Bog, Fen, Marsh, Swamp	Unknown
Northern Mountain-Ash	Makominagaawanzh(iig) or Makominatig	Sorbus decora	Swamp	Medicinal
Northern Wild Rice	Manoomin	Zizania palustris	Marsh	Food
Paper Birch	Wiigwaasatig (Eabametoong First Nation) Wigwaasatik (Marten Falls First Nation)	Betula papyrifera	Fen, Marsh, Swamp	Home uses; Medicinal
Prickly Rose	Unknown	Rosa acicularis	Marsh, Swamp	Food
Rose	Unknown	Rosa sp.	Marsh, Swamp	Unknown
Red-osier Dogwood	Miskwabiimagaatik (Eabametoong First Nation) Wabiminaatik (Marten Falls First Nation)	Cornus sericea	Fen, Marsh, Swamp	Medicinal

Common Name	Oji-Cree Name	Scientific Name	Peatland Habitat	Traditional Use Category
Red Raspberry	Miskominik	Rubus idaeus	Marsh, Swamp	Food
Red Willow – traditional name (also known as Green Alder)	Wikobatik	Alnus alnobetula ssp. crispa	Swamp	Medicinal
Small Cranberry	Mashkikominan	Vaccinium oxycoccos	Bog, Fen, Marsh, Swamp	Medicinal
Sphagnum Moss	Maashkigo'aaki	Sphagnum sp.	Bog, Fen, Marsh, Swamp	Home uses
Strawberry	Ode'minan (Wild Strawberry, Eabametoong First Nation) Miskomaang (Strawberry, Marten Falls First Nation)	Fragaria virginiana	Fen, Marsh, Swamp	Food; Medicinal
Tamarack	Mashkiigwaatig (Eabametoong First Nation) Maaskigwatik / wakinagan (Marten Falls First Nation)	Larix larincina	Bog, Fen, Marsh, Swamp	Medicinal
Trembling Aspen	Apijih pakoosh	Populus tremuloides	Fen, Swamp	Unknown
Velvet-leaved Blueberry	Minan	Vaccinium myrtilloides	Bog, Fen, Swamp	Food
White Spruce	Mihnaihk	Picea glauca	Bog, Swamp	Unknown
Yellow Pond-lily	Ateebagoon (Eabametoong First Nation) Okitebaag (Marten Falls First Nation)	Nuphar variegata	Marsh	Medicinal
Wild Celery	Unknown	Vallisneria americana	Marsh	Unknown
Willow	Ashiisigobiminsh(iig) (Eabametoong First Nation) Wiisihkobihmagoon (Marten Falls First Nation)	Salix spp.	Bog, Fen, Marsh, Swamp	Medicinal

8.1.8.4.3.2 Birds

- Of the 24 bird species identified as proxy valued components in **Appendix L**, 20 were recorded in peatland environments during field investigations or are known to use peatland communities for either nesting or foraging. These species include: dark-eyed junco (Oji-Cree translation, binechiinch gaanitaanigamoch) (Junco hyemalis), Wilson's snipe (Oji-Cree translation, nibiikaang gaa'ayaach binechiinch) (Gallinago delicata), mallard (Oji-Cree translation, ininiship) (Anas platyrhynchos), palm warbler, common yellow throat, northern waterthrush, sora, chimney swift, bank swallow, barn swallow, common nighthawk, eastern whip-poor-will, eastern wood-pewee, olive-sided flycatcher, bald eagle, short-eared owl, black tern, lesser yellowlegs, rusty blackbird, and yellow rail.

8.1.8.4.3.3 Ungulates

- Boreal caribou use peatland habitats throughout their various life stages in the Boreal Shield West Ecoregion, Boreal Shield West Central Ecoregion, and Hudson Plain Ecozone. Peatlands provide habitat for calving, post-calving, and rutting as well as winter habitat (**Appendix M**); and
- Moose life processes are supported by vegetation communities within the Local Study Area that include treed swamps (**Appendix M**).

8.1.8.4.3.4 Wildlife

- Of the wildlife species other than ungulates that are identified as valued components in **Appendix K**, amphibian and reptile species can be found in bogs, fens, marshes and swamps throughout the Local Study Area. Amphibian and reptile species that were examined include spring peepers, boreal chorus frog, mink frog, wood frog, northern leopard frog, American toad, western painted turtle, common snapping turtle, and eastern gartersnake;
- Other species examined that are likely to be found in peatland systems include Beavers in vegetation communities like marshes, fens, and thicket swamps with enough open water, American marten in mature coniferous swamp communities, and Wolverine (**Appendix K**); and
- Forage plants for pollinating insect species are present throughout the Local Study Area and peatland communities (**Appendix K**).

8.1.8.5 Carbon Storage and Flux

Attachment C of the Peatlands Technical Support Document (**Appendix I**) identified existing conditions within the Local Study Area, which are described in the following subsections.

8.1.8.5.1 Carbon Storage

Calculated total soil organic carbon storage within the existing conditions Local Study Area ranged from at 92,868,963 tonnes to 96,303,101 tonnes of carbon (depending on the calculation method); and

Given their large distribution within the existing conditions Local Study Area, fen and organic swamp communities accounted for the largest stores (more than 95 percent) of soil organic carbon in peatland communities.

8.1.8.5.2 Total Carbon Flux

8.1.8.5.2.1 Carbon Dioxide

- Total daily flux of carbon dioxide for the total peatland area within the existing conditions Local Study Area is -464 ± 1,630 tonnes of carbon dioxide; and
- Total seasonal flux of carbon dioxide for the total peatland area within the existing conditions Local Study Area is -14,186 ± 49,891 tonnes of carbon dioxide. Seasonal flux was evaluated for a growing season of 153 days.

Overall, these results indicate that peatland systems within the existing conditions Local Study Area are carbon dioxide sinks where more carbon dioxide is stored in peatlands than is released back into the atmosphere. On a peatland group scale, both fens and bogs were found to be sinks for carbon dioxide while organic swamp communities were sources of carbon dioxide, where more carbon is being released into the atmosphere daily and seasonally compared to what is being stored.

8.1.8.5.2.2 Methane

- Daily methane flux for the total peatland area within the existing conditions Local Study Area is 19 ± 6 tonnes of methane; and
- Seasonal methane flux for the total peatland area within the existing conditions Local Study Area is 2,970 ± 987 tonnes of methane. Seasonal flux was evaluated for a growing season of 153 days.

Overall, these results indicate that peatlands within the existing conditions Local Study Area are sources of methane. All peatland groups were identified as sources of methane with organic swamps accounting for the largest daily and seasonal releases of methane into the atmosphere.

8.2 Land

Marten Falls First Nation has a deep and enduring connection to their land, which is central to their identity, culture, and way of life. They view the land and its living creatures as integral to the circle of life, essential for maintaining balance and harmony in the environment. Traditional activities, such as moose hunting, allow Marten Falls First Nation to sustain their connection to the land and each other. Historically, the people of Marten Falls First Nation were self-sufficient, relying on the land for sustenance and healing, with knowledge passed down through generations. While open to development, members emphasize the importance of conserving their land and resources so future generations can continue to enjoy and benefit from them. This commitment to conservation is crucial for preserving their cultural and spiritual ties to the land. **Section 8.2** details the existing condition of vegetation, wildlife and physiography, soils and terrain within the Project study areas.

8.2.1 Indigenous Knowledge of Land

Information provided by Indigenous Knowledge holders, recognized as such by their Indigenous community, has been collected through literature review and shared directly by Indigenous communities in support of the Community Access Road through face-to-face meetings or receipt of Indigenous Knowledge reports. The information used to inform this reporting related to the land disciplines is summarized in **Table 8.2-1**. Some information that has been provided is considered confidential. Where possible this information has been summarized at a high-level, removing any confidential details and is included in **Table 8.2-1**. Where this is not possible it has been excluded from **Table 8.2-1** and has still been considered throughout the Technical Support Documents where applicable.

Table 8.2-1: Indigenous Knowledge of Land

Topic	Indigenous Community	Details
• **Traditional Plant Names, Observations and Uses**	• Eabametoong First Nation (Eabametoong First Nation et.al, no date)	• The Eabametoong First Nation Biodiversity Atlas was used to inform the list of traditional use plants for the Community Access Road.
• **Traditional Plant Names, Observations and Uses**	• Marten Falls First Nation [no date (a), 2017b, 2019, 2022a, 2022b, 2023c]	• Existing Anishnebek Knowledge paths and locations were considered when determining how accessible each of the mapped candidate habitat areas for traditional use plants may be. This informed the scoring of ecosites for traditional use plants habitat suitability mapping.
• **Traditional Plant Names, Observations and Uses**	• Marten Falls First Nation (2019; Appendix O)	• Comments were provided noting red willow (Alnus alnobetula ssp. crispa; Oji-Cree translation, wikobatik) and tamarack (Larix laracina; Oji-Cree translation, maaskigwatik / wakinagan) species are used medicinally, and red willow and cedar (Thuja occidentalis; Oji-Cree translation, kiishikatik) are observed to be lost in the south from housing developments. It was requested to avoid cutting through saskatoonberry (Amelanchier alnifolia; Oji-Cree translation, kosihgwakaminatik) and highbush cranberry (Viburnum opulus; Oji-Cree translation, aniibiminaatik).
• **Traditional Plant Names, Observations and Uses**	• Marten Falls First Nation (Appendix O; Marten Falls First Nation, 2023b)	• The Community identified a number of vegetation / plant species that are / were used for a variety of purposes including for food, ceremonial, and medical purposes: – Tobacco (Nicotiana), Labrador tea (Rhododendron groenlandicum or Ledum groenlandicum; Oji-Cree translation, kakikebak), sage (Salvia sp.), sweetgrass (Hierochloe odourata), and muskrat root (sweet flag) (Acorus calamus; Oji-Cree translation, wiikenh), which are used for ceremonial purposes. – Peat and moss which was often used for cleaning dishes, diapers and lining cradleboards (Oji-Cree translation, tikinaagans). – Aspen (Populus tremuloides), birch (Betula; Oji-Cree translation, wigwaasatik), blueberry (Vaccinium sect. Cyanococcus; Oji-Cree translation, miinesan / makomiinasan), cedar, lowbush cranberry (Vaccinium vitis-idaea, Oji-Cree translation, maashkiigominan), highbush cranberry, gooseberry (Phyllanthus emblica, Oji-Cree translation, oshabomin), jack pine (Pinus banksiana; Oji-Cree translation, okikatik), Labrador tea, poplar (Populus; Oji-Cree translation, maan azaadii), moss (Bryophyta), muskrat root (sweet flag), red willow, saskatoonberry, raspberry (Rubus idaeus; Oji-Cree translation, miskomaang / oshkiizhikomin-naan), rose hip (Rosa canina L.), white spruce (Picea glauca, Oji-Cree translation, mihnaihk), black spruce (Picea mariana; Oji-Cree translation, shikobaatik), sweetgrass, and tamarack, wild rice (Zizania palustris, Oji-Cree translation, manoomin), and willow (Salix, Oji-Cree translation, wiisihkobihmagoon). – Muskrat root (Oji-Cree translation, wiikenh), which can be found in swampy areas.
• **Traditional Plant Names, Observations and Uses**	• Aroland First Nation (Appendix O)	• The community noted that the community considers wild rice an important staple food.
• **Traditional Plant Names, Observations and Uses**	• Aroland First Nation (Appendix O)	• The community noted that the following vegetation is of importance to the community: arrowhead (Syngonium podophyllum), bear root (Ligusticum porteri), birch, blueberry, bulrush (Scirpus), cedar, cattails (Typha), cranberry, fireweed (Chamaenerion angustifolium, Oji-Cree translation, awihkabigwaan), muskrat root (sweet flag), red willow, rock tripe lichen (Umbilicaria), sweetgrass, wild celery (Apium), wild onions (Allium canadense), and the buds of juniper (Juniperus; Oji-Cree translation, kakakiwadaang) and spruce trees (Picea).
• **Concerns Related to Vegetation / Traditional Plants**	• Aroland First Nation (Appendix O)	• The community noted interests related to the potential negative effects of spraying for highway maintenance and spraying in favour of promoting deciduous growth over coniferous growth. In particular, community members expressed concerns related to impacts on berries. • Aroland First Nation noted that the following vegetation species are of importance to the community: arrowhead, bear root, birch, blueberry, bulrush, cedar, cattails, cranberry, fireweed (Oji-Cree translation, awihkabigwaan), muskrat root (sweet flag), red willow, rock tripe lichen, sweetgrass, wild celery, wild onions, and the buds of juniper and spruce trees.
• **Invasive Species**	• Aroland First Nation (Appendix O)	• The community noted interests related to the potential spread of invasive species.
• **Traditional Plant Names, Observations and Uses**	• Fort Albany First Nation (2020)	• Fort Albany First Nation has also noted an overall importance of peatlands to their community and Indigenous Peoples throughout the region. The community highlighted this by stating that the meaning of Omushkegowuk (the people of the muskeg) speaks to the central importance of the peatlands to the community's culture and well-being. • Members of Fort Albany First Nation provided input relating to vegetation species of importance including Sage (Salvia sp.), various berry species (for example, Cranberry, Wild Strawberry, Wild Raspberry), Red Willow, Labrador Tea, Pine, Cedar, Spruce, Tamarack, Sage, and Paper Birch. • Fort Albany First Nation also provided detail relating to areas within their traditional territory where members reported harvesting plants and medicines including (but not limited to) Fort Albany, coastal areas between the Albany and Moose River estuaries, along the Moosonee Road, and tributaries of the Albany River such as Henley River, Ghost River, and Yellow Creek. One member also noted that some plant harvesting locations have been passed on across generations, noting that they had travelled to the same area to harvest Sage and Cranberry for 30 years. • Fort Albany First Nation community members have also noted a seasonality associated with plant harvesting activities. For example, one member highlighted the summer as being a time to pick sage, whereas cranberries are only harvested in September or October.

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• **Traditional Plant Names, Observations and Uses**	• Kashechewan First Nation (MNP LPP, 2024b)	• Members of Kashechewan First Nation have noted that many species of berries which are typically harvested can be found along rivers or swampy areas, and that summer is the best time to gather berries. • Members of Kashechewan First Nation noted the importance of harvesting traditional use plants, including medicinal and edible plants and berries, throughout Kashechewan's traditional areas: – Cedar, Labrador tea, Red Willow, and Tamarack were identified as valued medicinal plant species that are harvested and useful for medicinal purposes (for example, treating coughs, colds, cuts, and headaches). – Several species of berries identified as being harvested by Kashechewan First Nation include lowbush cranberry (referred to as mooseberry), Blueberry, Gooseberry, Raspberry, Red Currant Berry, Bearberry, Saskatoonberry, and Strawberry. – Some members of Kashechewan First Nation have also noted an observed change in the availability of some traditionally harvested berry species over time within their traditional territory, believed to be a result of the placement of hydro lines associated with the Victor Diamond Mine.
• **Traditional Plant Names, Observations and Uses**	• Nibinamik First Nation (Dillon, 2024a)	• Nibinamik First Nation noted the importance of edible berries (for example Bearberry and Bunchberry), as well as Wild Rose, acorns, and Labrador Tea, also describing several medicinal uses for acorns, boiled bark, roots, Labrador Tea. • The community stated that they created snowshoes, toboggans, and birch bark canoes with various plant materials. Additionally, built wigwams covered in evergreen boughs and birch bark shelters - which were made from bark cut into different sizes and held together by woven Spruce roots.
• **Traditional Plant Names, Observations and Uses**	• Weenusk First Nation (MNP LPP, 2024a)	• Weenusk First Nation highlighted the importance of berries to the community, noting Cloudberry, Cranberry, Blueberry as species that are found in close proximity to the community. The community also noted that other important areas for plant gathering include areas for collecting firewood, and areas around family camps that support berry growth. One community member stating the following about gathering pants: "Just like the meat we still get medicines from the from the ground and berries." • Weenusk First Nation noted that the tobacco plant may be left as an offering for harvested animals to demonstrate respect and appreciation for the land.
• **Observations related to vegetation habitat**	• Aroland First Nation (Shared Value Solutions, 2024)	• Aroland First Nation identified the area at Patience Lake as one utilized for gather harvested vegetation species including plants, berries, medicines, such as spruce roots (which may be utilized for fish traps and other binding uses). • Aroland First Nation also noted the presence of Wild Rice within the area of Ogoki Lake, Melchett Lake, Tennant Lake, Kapikotongwa Lake, Briarcliffe Lake, Nass Lake, and Durer Lake.
• **Concerns Related to Vegetation**	• Aroland First Nation (Shared Value Solutions, 2024; Appendix O) • Kashechewan First Nation (MNP LPP, 2024b) • Fort Albany First Nation (Firelight Research Inc., 2024). • Weenusk First Nation (MNP LPP, 2024a)	• Aroland First Nation noted interests related to the potential negative effects of spraying for highway maintenance and spraying in favour of promoting deciduous growth over coniferous growth. In particular, community members expressed concerns related to impacts on berries, one community specifically highlighting concerns relating to impacts on blueberries. • Aroland First Nation also noted interests related to the potential spread of invasive species. • Kashechewan First Nation noted that there has been an observed change to the availability of some traditionally harvested berry species over time, believed to have been attributed to the placement of hydro lines in their traditional territory associated with the Victor Diamond Mine. • One community member from Aroland First Nation specifically noted concerns that dust, sand, and debris would impact plants along the road, or make its way into the river system at watercourse crossings, noting "And all that dust that, especially the summertime with all that dust that's flying around, it's going to have an impact on those plants along the road. And that's where the, they'll probably slowly die out because there's so much sand on them […] plus the water system, the bridges, on the bridges there, they'll be sand come, going into the river system, same thing. It's going to have an effect on the wildlife, and the plants even, the plants. Even then, I think it would really have an impact on insects too….and that's another thing, the environment. All that dust kills the plants and everything, pollutes the water along the way." • Fort Albany First Nation also noted similar concerns in relation to how the Community Access Road may result in pollution effects (for example, vehicle emissions, dust) on plants and plant habitat. One community member shared past observations relating to road pollution effects associated with the Victor Diamond Mine, noting browning of roadside adjacent vegetation. "There's a winter road that goes right through my territory, and it's been 10 years maybe it's been used. Like they had those — first they start car-vehicles, nothing heavy.... So, maybe about since the [Victor Diamond] mine started, and when they were hauling those heavy equipment and big, big materials, like those big trucks, mining trucks, those dump trucks, those big tractors. Those trucks are hauling the semis. They're going back and forth. I noticed that fumes were killing the plants, eh.... You know, those plants were turning brown along the road, the side of the road. Maybe about 50 feet off, you'll see the plants go brown... I noticed that fumes [from the vehicles] were killing the plants, eh."

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		• Weenusk First Nation noted concerns related to contamination of medicinal plants. In particular, the importance of these resources remaining uncontaminated as the community also relies on access to harvested medicines for treatments since the cost of travel south outside of Peawanuck is expensive. One community member noting: “My father used to gather some medicine when my mother would cough or get the flu (…) they used to boil (…) pinecones. My mother used to drink that. Tastes awful but it works.”; and another community member referencing the use of Labrador Tea to combat aching bones and colds. The community also highlighted the importance of transmitting knowledge about medicines to the younger generation so that it is not lost. • Weenusk First Nation also noted concerns specific about: – The potential for impacts related to air quality as a result of fugitive dust from movement and operations of construction equipment and vehicles. – Impacts to harvestable species within the community’s traditional territory as a result of increased access. – Potential impacts related to the use of herbicides. • Changes in the composition of vegetation communities.
• **Amphibians and Reptiles (Oji-Cree translation, ginebigo ya’haag omakakiiwiiya’haag)** • **Pollinating Insects (Oji-Cree translation, manichooshaga)**	• Aroland First Nation (Shared Value Solutions, 2024) • Marten Falls First Nation (2020)	• Aroland First Nation has noted the presence of snake, turtle habitat in the area of Melchett Lake, Tennant Lake, Kapikotongwa Lake, Briarcliffe Lake, Nass Lake, and Durer Lake. • Marten Falls First Nation noted that insects (Oji-Cree translation, maanijoosh / aag) have a strong seasonal presence in the planning area. During spring and summer months the mosquitos and blackflies are very prevalent, which should be considered by any travellers to the area. The community noted that other common insects include dragonflies, butterflies (Oji-Cree translation, memmegweh), bumble bees (Oji-Cree translation, ammoog), deer flies, and horse flies. • The community also noted that amphibians common to the proposed planning area included toads and frogs, in addition to less common amphibians such as blue spotted (black) salamanders. Reptiles in the proposed planning area are represented by the eastern gartersnake. Information about the blue spotted salamander was used to inform the literature review as this Indigenous Knowledge was the only available data on the distribution of the species in the wildlife Regional Study Area.
• **Birds** • **Furbearers** • **Large Mammals**	• Aroland First Nation (Dillon, 2024b) • Fort Albany First Nation (Firelight Research Inc., 2024) • Kashechewan First Nation (MNP LPP, 2024b) • Marten Falls First Nation (2023b; Appendix O) • Nibinamik First Nation (Dillon, 2024a) • Weenusk First Nation (MNP LLP, 2024a)	• A number of wildlife species were noted by Aroland First Nation, Fort Albany First Nation, Nibinamik First Nation, Marten Falls First Nation, and Weenusk First Nation and used to inform the overall selection of wildlife valued components, and wildlife species considered in the report. Aroland First Nation and Marten Falls First Nation described several culturally important species (some of which are used for harvesting purposes) including beaver, black bear (Oji-Cree translation, makwa), blue goose, brant, caribou, Canada goose, deer (Oji-Cree translation, wawashkeshi), duck (Oji-Cree translation, shesheeb), fisher (Oji-Cree translation, ojiig), fox (Oji-Cree translation, waakosh), lynx (Oji-Cree translation, mizhih’bizhiw), marten (Oji-Cree translation, wabizheshih, wabashtan), mink (Oji-Cree translation, shakweshi), moose (Oji-Cree translation, mooz), muskrat (Oji-Cree translation, wajaashk), porcupine (Oji-Cree translation, kaag), rabbit, river otter (Oji-Cree translation, nigig), ruffled grouse (Oji-Cree translation, papashki), snow goose, snowshoe hare (Oji-Cree translation, wabooze), squirrel, weasel (Oji-Cree translation, zikosih), and wolf (Oji-Cree translation, maihgan). • Aroland First Nation have also provided Indigenous Knowledge relating to the presence of habitat for furbearers including beaver, fisher, fox, lynx, marten, muskrat, otter, rabbit, squirrel, weasel, as well as wolf. Similar to Marten Falls First Nation, Aroland First Nation also noted several harvesting / hunting areas associated with these species, including areas adjacent to the Painter Lake Road and along the Kapikotongwa River. • A number of key wildlife species and harvesting areas were identified by Kashechewan First Nation as species that are typically harvested throughout their traditional area including beaver, rabbit, marten, black bear, fox, lynx, muskrat, otter, and wolf. • Members of Kashechewan First Nation have identified changes to wildlife communities including increases in species not typically found within their traditional territory including wolverine and raccoon.
• **Furbearers** • **Large Mammals**	• Aroland First Nation (Shared Value Solutions, 2024) • Marten Falls First Nation (2023b)	• Aroland First Nation noted the presence of important habitat for otter, as well as the presence of habitat for bear within the area of Patience Lake. • Marten Falls First Nation noted that several personal hunting / trapping / harvesting sites (both commercial and recreational such as snaring, guiding, tourism) and animal species habitats are located along either side of the Albany River near the proposed Community Access Road route(s). Hunting / harvesting sites cross the Albany River, east of Ogoki Lake; as well as the Dusey River. • Marten Falls First Nation also noted the following: – The presence of moose, beaver, and wolverine near the Dusey River; – The presence of beaver, marten, muskrat, rabbit, mink, and otter along the western alternative (Alternative 4) for Segment 1 of the Community Access Road; and

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		– The presence of lynx, mink, and wolverine, moose, caribou, beaver, river otter, and marten habitat where the Pahtegoshing River meets the Albany River (the presence of abundant fish is said to contribute to animals congregating in this area). • Marten Falls First Nation noted that the community used to be known as a community of trappers, and that trapping was a way of life for all Marten Falls First Nation families. The community also highlighted that trapping activities typically take place during the months of October and May.
• **Furbearers**	• Fort Albany First Nation (Firelight Research Inc., 2024)	• Fort Albany First Nation highlighted a correspondence between the six-season cycle (observed by Fort Albany First Nation) and changes in the environment, noting a particular relationship between the timing of the spring break-up season, when rivers open and ice melts and flows downstream into James Bay – and the increased presence of small aquatic animals such as beavers and otters in the water.
• **Concerns and Mitigation Measures**	• Aroland First Nation (Appendix O) • Marten Falls First Nation (2023b; Appendix O)	• Both Aroland First Nation and Marten Falls First Nation noted concerns in relation to wildlife and harvesting of wildlife. These concerns were used to inform the inclusion of potential effects and mitigation measures, including the following: – Road and land development (including logging), increased traffic, dust, noise, and pollution causing alterations and / or impacts to wildlife including wildlife habitat, health, migration patterns, and population size; – Noise pollution impacting resulting in the scaring of animals away from commercial harvesting or guiding areas; – The potential for overhunting, unsustainable harvesting, competition with non-locals, and impacts to traplines associated with increased access to hunting areas; – Increased beaver activity and potential damage to roads / culverts; and – The potential for the spread of invasive species. • The following are suggestions to offset these concerns: – Not building the road altogether, and / or building the road at least 1 hour away (walking distance) from harvesting sites; – Tracking moose and caribou to gather information on their activities and routes on the land; – Increased presence of Ministry of Natural Resources including stricter regulations / licensing and game wardens to patrol the road and stop people from hunting out of season; – Creating wildlife crossings, implementing signage along the road, limiting construction away from sensitive wildlife areas; – Involving communities in environmental monitoring; and – Limiting access to Marten Falls First Nation territory with physical deterrents.
• **Furbearers** • **Large Mammals**	• Marten Falls First Nation (2023b)	• Marten Falls First Nation noted that human-induced environmental issues including the consequences of the fur trade have affected the furbearing mammal populations throughout the community's traditional territory. • Additionally, muskrat was identified by Marten Falls First Nation as a species experiencing a decline in numbers. It was suggested that water quantity / water levels in the winter months may be affecting the species. • Some community members from Marten Falls First Nation noted that they had not used their traplines in an extended period of time of about 10 years. Traplines are underutilized due to decline in demand for furs making trapping not economical, so few Marten Falls First Nation members engage in commercial trapping. Additionally, the community noted a decline in trapping related to less interest from the younger generations.
• **Furbearers** • **Large Mammals**	• Marten Falls First Nation (2023b)	• Marten Falls First Nation noted that small game was / is used as a food source; for medicinal and healing purposes properties (such as, skunk [Mephitidae; Oji-Cree translation, shikaag] oil derived from the fat of the skunk); as well as for other goods such as furs for clothing and blankets (such as, rabbit fur-lined moccasins, gloves, and blankets).
• **Furbearers**	• Aroland First Nation (Shared Value Solutions, 2024) • Marten Falls First Nation (2023b)	• Aroland First Nation noted the presence of beaver habitat within the area of Ogoki Lake. • Aroland First Nation have also noted observations relating to a decline in the beaver and muskrat population over the years, relating to historical hydroelectric damming / diversions on the Ogoki River at the Waboose Dam. Community members noted the following regarding this observed decline: – "Back then they used to. Like I said before, people in Ogoki Lake, like our families back then, like my grandmother, my grandfather and my dad's uncles and all that, used to go to Dusey Lake and back and forth to go hunting geese, hunting and all that, trapping, looking for beaver."….."Back then it was pretty hard to find beaver, they said, at one point because it almost got extinct. Over trapped and the [Waboose] dam. They blamed the dam mostly because of the, for the beaver and muskrat anyway, even the otter, all those other furbearing animals, otter, mink and all that. Because they have their young ones in springtime and they have their little huts here in the water, and when the water was let go, that sort of diminished their hunting area close by the Ogoki River system. So, they had to venture off a little further down like Dusey Lake and all that."…."You know that dam they got in Ogoki? The Ogoki? That big dam they got, Waboose dam, they call it? That caused a lot of problems for them back then. All the sturgeon and all the river beaver, muskrat.

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		Caused a lot of problems for them. Every time they opened that dam, all those spawning fish would get washed away. Same thing with the little beaver and the little muskrat. Washed them away. Caused a lot of problems back then. And still to this day, that's what's the problem now with that dam. When they release it, everything's gone. And they were saying that, my parents were saying that when the little beavers and the little muskrat, when they were getting born or whatever, they would wash away. Because when they let that dam go, everything that's along the river washes away." – Another participant also shared a story their father told them of beaver and muskrat dying when waters released from the dam flooded overtop of existing ice on the rive noting the following, "I remember my dad was telling me, when they built that dam there, my dad knows about it when they built that dam. Then one time, they used to trap on that Ogoki River. They were living in Kagianagami. They'd come there on Ogoki River to come and spring trap. There was water on the river on top of the ice. They let the water go at Waboose Dam. Everything died, like all the beavers and muskrats and whatever lived under the ice. So, they had to turn back." • Marten Falls First Nation noted that trapping small game is important for maintaining ecological balance in the community's traditional territory. An example was provided related to an increase in beaver activity that has been attributed to less people trapping this species. • Marten Falls First Nation members also noted the presence of beavers along the Albany River; Pategoshing River; and at Washi Lake (Oji-Cree translation, Obaashiwizaagaykaniing). Community members notes that beavers had not been noted historically at Washi Lake and described increased beaver activity approximately 20 kilometres downstream of Marten Falls that has resulted in low water levels in the Albany River and harder navigation. Additionally, Marten Falls First Nation noted additional information about beavers including species behaviours such as harvesting trees to build dams and lodges, and to feed on vegetation (for example, poplar [Oji-Cree translation, maan azaadii]). The community also noted that beavers tend to give birth in the spring and harvest trees to build lodges in the fall for the wintertime.
• **Furbearers**	• Marten Falls First Nation (2023b)	• Some community members from Marten Falls First Nation noted that they had not used their traplines in an extended period of time of about 10 years. Traplines are underutilized due to decline in demand for furs making trapping not economical, so few Marten Falls First Nation members engage in commercial trapping. Additionally, the Community noted a decline in trapping related to less interest from the younger generations.
• **Furbearers**	• Marten Falls First Nation (2023b)	• Marten habitat exists the area of the proposed Community Access Road route(s). Marten depends on these areas to carry out life processes including feeding on rabbits, squirrels, and mice. February is a sensitive time for Marten as this is when they mate.
• **Furbearers**	• Aroland First Nation (Appendix O)	• The presence of beaver habitat within the area of Ogoki Lake and have also noted observations relating to a decline in the beaver population over the years, relating to historical hydroelectric damming / diversions on the Ogoki River at the Waboose Dam.
• **Furbearers**	• Kashechewan First Nation (MNP LPP, 2024b)	• Kashechewan First Nation noted beaver as a key wildlife species that is harvested traditionally at several sites located within their traditional territory.
• **Furbearers**	• Fort Albany First Nation (Firelight Research Inc., 2024)	• Fort Albany First Nation has observed a six-season cycle and changes in the environment, including a relationship between the timing of the spring break-up season and increased presence of small aquatic animals such as beavers and otters in the water.
• **Concerns about Wildlife** • **Mitigation Measures**	• Aroland First Nation (Dillon, 2024b) • Aroland First Nation (Shared Value Solutions, 2024) • Fort Albany First Nation (Firelight Research Inc., 2024) • Kashechewan First Nation (MNP LPP, 2024b) • Marten Falls First Nation (2023b; Appendix O) • Weenusk First Nation (MNP LPP, 2024a)	• Marten Falls First Nation described: – Road and land development (including logging), increased traffic, dust, noise, and pollution causing alterations and / or effects on wildlife including wildlife habitat, health, migration patterns, and population size; Noise pollution effects resulting in the scaring of animals away from commercial harvesting or guiding areas; – The potential for overhunting, unsustainable harvesting, competition with non-locals, and effects on traplines associated with increased access to hunting areas; – Increased beaver activity and potential damage to roads / culverts; and – The potential for the spread of invasive species. • Fort Albany First Nation noted a variety of concerns related to wildlife, wildlife habitat, and the harvesting of wildlife stemming from anthropogenic stressors, particularly increases in environmental disruption, contamination, and pollution. Some of these concerns included: – Loss of habitat areas for hunted and trapped game, including disturbance of sensitive wildlife habitat such as muskeg habitats and mossy areas, reducing the muskeg's important air and water filtering function and its role as a habitat for small mammals and rodents. – Changes in animal behaviour due to disruption of the landscape, causing effects on seasonal harvesting in preferred or expected harvesting areas. The community noted that introduction of a road in an uninterrupted landscape could result in animals moving to different areas in search of adequate habitat and water sources. – General worry that viability of harvested wildlife species will be reduced once the Community Access Road is complete.

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		• Concerns outlined by Aroland First Nation included: – One community member from Aroland First Nation specifically noted concerns that dust, sand, and debris would affect plants along the road, or make its way into the river system wat watercourse crossings, noting “And all that dust that, especially the summertime with all that dust that’s flying around, it’s going to have an impact on those plants along the road. And that’s where the, they’ll probably slowly die out because there’s so much sand on them […] plus the water system, the bridges, on the bridges there, they’ll be sand come, going into the river system, same thing. It’s going to have an effect on the wildlife, and the plants even, the plants. Even the, I think it would really have an impact on insects too….and that’s another thing, the environment. All that dust kills the plants and everything, pollutes the water along the way.” – Aroland First Nation also noted concerns relating to how increased access to the region may make it easier for people to access harvesting areas, putting additional pressure on wildlife populations, with one community member noting, “The first thing I thought about was the wilderness, the animals would be disturbed. If the road goes through there, they’re travelling routes would be disrupted. And also, their feeding might be disrupted. As for the fish, I think if they build bridges and all that, it’s easier access for humans to go harvest. To me, that would be very destructive for the wildlife and fishery.” – Potential for adverse effects to wildlife due to increased predation and increased ease of hunting due to better sightlines along the corridor. – Potential increase in litter and the effects on wildlife. – Potential spread of invasive species. • Members of Kashechewan First Nation have also noted concerns related to the potential for road mortality following road completion, as well as increased noise from the construction and road traffic during the operations phase resulting in animals moving away (based on previous experiences with the Victor Mine project) or alterations to migration patterns. The following are suggestions from Marten Falls First Nation to offset these concerns: – Not building the road altogether, and / or building the road at least one hour away (walking distance) from harvesting sites; – Tracking moose and caribou to gather information on their activities and routes on the land; – Increased presence of Ministry of Natural Resources including stricter regulations / licensing and game wardens to patrol the road and stop people from hunting out of season; – Creating wildlife crossings, implementing signage along the road, limiting construction away from sensitive wildlife areas; – Involving communities in environmental monitoring; and – Limiting access to Marten Falls First Nation territory with physical deterrents. • Aroland First Nation also provided suggestions to offset these concerns including – Implementing reduced speed limits in known wildlife habitat / crossings. • Weenusk First Nation noted the following concerns related to wildlife: – Changes to wildlife quantity as a result of effects to survival, reproduction, mortality of wildlife species. – Increased public access and related effects to wildlife (for example, vehicle strikes, hunting). • The potential for effects related to air quality as a result of fugitive dust from movement and operations of construction equipment and vehicles.
• **All Bird Valued Components**	• Animbiigoo Zaagi’igan Anishinaabek (Stantec, 2017) • Mushkegowuk Council (Nextbridge Infrastructure, 2018) • Kingfisher Lake First Nation (SNC-Lavalin, 2020)	• Several Indigenous communities shared concerns related to potential impacts of contaminants on bird species. This included: – Animbiigoo Zaagi’igan Anishinaabek expressed interest in relation to effects on waterfowl and migratory birds and the potential for contamination of waterfowl. • Indigenous Knowledge shared by Mushkegowuk Council and Kingfisher Lake First Nation included concerns ranging from increased vehicle emissions to ingestion of contaminants by bird Species at Risk.
• **Species at Risk Birds** • **Waterfowl and Waterbirds**	• Marten Falls First Nation (2023a) • Aroland First Nation (Shared Value Solutions, 2024)	• Information shared by Marten Falls First Nation included observations of a number of species in the area of Washi Lake including nighthawks, mergansers, golden eyes, mallards, and loons. Additionally, duck habitat was noted within 5 kilometres of the proposed Community Access Road routes near the Albany River. • Community members from Marten Falls First Nation have noted a decline in the number of mergansers, golden eyes, mallards, and loons present in the area of Washi Lake. Information shared by the Community also noted that seeing these specific species was becoming a rarer occurrence. • Aroland First Nation has noted the presence of eastern wood-pewee within the area of Ogoki Lake, Melchett Lake, Tennant Lake, Kapikotongwa Lake, Briarcliff Lake, Nass Lake and Durer Lake.

Topic	Indigenous Community	Details
• **Bird Habitat** • **Waterfowl and Waterbirds**	• Attawapiskat First Nation – Indigenous Knowledge obtained from Chief Ignace Gull (Human Rights Watch, 2020) • Fort Albany First Nation (Firelight Research Inc., 2024) • Kashechewan First Nation (MNP LPP, 2024b) • Weenusk First Nation (MNP LPP, 2024a)	• Indigenous Knowledge shared by Attawapiskat First Nation included observations related to changes to migratory birds in Attawapiskat, with one community member noting “water is getting warmer, the ice melts early. Other things—what we see today are pelicans migrating North; cormorants, we see many of them.” • Fort Albany First Nation described observations relating to changes in migratory bird patterns due to anthropogenic stressors (including climate change and infrastructure development such as transmission lines) within their traditional territory and in the Moosonee and Attawapiskat area. • Fort Albany First Nation identified a decline in the quality of wild game, making specific reference to the taste of harvested migratory birds. Multiple Fort Albany First Nation community members have attributed this decline in the quality of wild game due to changes in feeding (including the muskeg and shoreline of James Bay). Within the community, there have also been reports of a goose found covered in oil. • Members of the Kashechewan First Nation community have noted declines in geese population numbers and changes to geese migration patterns due to earlier snowmelt timing. • Weenusk First Nation have noted previous experiences relating to how disturbance to migratory animals through construction have affected migration routes and the availability of harvested species in Weenusk’s traditional territory. In particular, the community noted a decline in waterfowl and migratory birds such as Canada goose, snow geese, and ducks.
• **Waterfowl and Waterbirds** • **Cultural Significance**	• Fort Albany First Nation (Firelight Research Inc., 2024) • Weenusk First Nation (MNP LPP, 2024a)	• Fort Albany First Nation has noted that forestry activities have affected waterfowl (geese and duck) populations within the area of Patience Lake, as well as an area adjacent to the Anaconda Road, where clearcutting activities which occurred in the past have affected the ability of community members to harvest geese, with one community member noting the following after being questioned about whether they had concerns about how the proposed road development (and other types of development projects) result in effects: – “Oh, yes, it will. Because from my experience, like the cutovers, like harvesting areas in our community here, so where we used to hunt, there's less ducks now in that area [Patience Lake], and moose, hardly any moose. Because I think that when the trees are harvested, especially the geese in the springtime, when they wait for the geese to come by, there's hardly any now, because I think they can not navigate on that land because of the trees [being gone] and all that. It's all cut over. Not as much as before it was cut down. It used to be, when we used to have blinds in the mouth of the river, geese used to land maybe every five minutes. You only have enough time to retrieve whatever you kill, but now sometimes you have to sit all day before one flock comes down.” • Another community member from Fort Albany First Nation echoed these sentiments, noting an observed connection between the effects of forestry impacts on duck and geese populations noting: – "There are already less ducks and geese in the area. Likely impacted by forestry cuts - they can not navigate on the land without the trees. More developments will have a greater impact.". • Fort Albany First Nation highlighted the correspondence between each of the six seasons and changes in the environment. Members of the community have noted the life cycles of migratory birds and waterfowl corresponding to the Moulting Moon and the Flight Moon in the summer season. • Certain species, their behaviours, and locations these species are found in correspond to each of the six seasons and their moons. The early spring thaw is characterized by the return of migratory birds such as spring geese and snow geese that stop over multiple locations to feed. – “[Spring Geese] they would be migrating from the south to come and stay. And they would stay in the coastal areas. They would moult in the coastal areas, and they would go as far as like Akimiski Island, which is Attawapiskat and goes north from there. The snow geese would do the same thing. They would migrate from the south and then stop for a while and — to feed, and then they would go north in the arctic.” • Additional community members from Fort Albany First Nation also shared observations relating to the Moulting Moon (July), and the fall season (September and October) describing moulting behaviours during the summertime and departure of the geese back south during the fall. – "July would be the moulting season — Moulting moon. That’s when all the geese and the ducks and the snow geese would drop their feathers, their prime feathers, and they would change. They would get new — new feathers in July. They can not fly. … And in August it’s the Flight moon. That’s when all the birds start flying again. They become airborne in August. So, that’s what we call summer.” – "…. In September, they would come there, and they would stop there for about a month or so. And then October is the Migrating moon. It’s when all the birds — all the birds leave in October and go back south in October. So, that’s the fall season." – Fort Albany First Nation highlighted that rivers (including the Albany River) are a key feature of the Atlantic migration flight route, playing important roles as geographical markers which guide and orient the birds during their fall migration. • Fort Albany First Nation community noted key species that are traditionally harvested including ruffled grouse (partridge) and migratory geese and other waterfowl, as well as collection of bird eggs. • Several community members from Weenusk First Nation noted observations related to a decline in waterfowl / migratory birds including Canada geese, snow geese, and ducks.

Topic	Indigenous Community	Details
• **Waterfowl and Waterbirds**	• Aroland First Nation (Firelight Research Inc., 2024)	• Aroland First Nation provided details related to species occurrences, noting the presence of goose nesting areas within the area of Patience Lake. • Aroland First Nation also noted the presence of waterfowl species, as well as Ptarmigan within the area of Patience Lake, as well as the presence of bird / waterfowl habitat within the area of Ogoki Lake. • Waterfowl, eagle, eastern wood pee-wee habitat was noted in the area of Melchett Lake, Tennant Lake, Kapikotongwa Lake, Briarcliffe Lake, Nass Lake, and Durer Lake.
• **Raptors**	• Kingfisher Lake First Nation – Indigenous Knowledge (Ministry of the Environment, Conservation and Parks, 2019) • Aroland First Nation (Shared Value Solutions. 2024)	• Kingfisher Lake First Nation noted bald eagle (Haliaeetus leucocephalus; Oji-Cree translation, mikisi) is relatively abundant in Pipestone River Provincial Park. • Aroland First Nation noted the presence of eagles within the areas of Ogoki Lake, Melchett Lake, Tennant Lake, Kapikotongwa Lake, Briarcliffe Lake, Nass Lake and Durer Lake.
• **Bird Habitat** • **Waterfowl and Waterbirds** • **Other Bird Species**	• Marten Falls First Nation [no date (b), 2023b]	• Marten Falls First Nation noted the importance of maintaining bird populations for maintaining ecosystem balance. • The Community also shared Indigenous Knowledge related to the distribution and habitat preferences of other bird species including Canada jay (whiskey jack) (Perisoreus canadensis; Oji-Cree translation, kwiikwiishih), chickadee (Poecile; Oji-Cree translation, kijakaneshish), ducks, geese, kingfisher (Alcedinidae), loons (Gavia; Oji-Cree translation, maang), mallard (Anas platyrhynchos; Oji-Cree translation, ininiship), osprey (Pandion haliaetus; Oji-Cree translation, saagwadamo), and ravens (Corvus corax; Oji-Cree translation, kakakihwug). Observations / input included: – Geese go into peatlands, rivers, and lakes and tend to migrate towards the east. Additionally, migration patterns seem to be changing as there used to be many geese in early to mid-April and now more appear in June. – Geese appear to be not as plentiful in Thunder Bay as in Manitoba or on the eastern coast. – Loons, ducks, and geese nest along the Albany River. – Mallards tend to reside in wetland areas. – Species including Canada jay (whiskey jack), chickadee, and raven are common to the north. – Canada jay (whiskey jack), bald eagles, and great blue herons (Ardea herodias; Oji-Cree translation, moskaohshug) was noted within Project study areas. • Species including kingfisher and osprey are common where fish are present.
• **Potential Concerns**	• Marten Falls First Nation (2023b)	• Concerns shared by Marten Falls First Nation included the those related to dust effects on water, plants, and wildlife (including birds). This included: – Concerns relating to dust and pollution due to increased traffic / pollution in the area as a result of logging activities; – Concerns related to bird habitat and nesting places due to increased logging activities; and – Potential impacts to bird food sources (such as, fish) due to heightened fishing activities and other anthropogenic activities.
• **Forest Birds** • **Waterfowl and Waterbirds**	• Aroland First Nation (LeBlanc, 2014) • Constance Lake First Nation (Stantec, 2017b) • Fort Albany First Nation (Firelight Research Inc., 2024) • Marten Falls First Nation (2023b; Appendix O) • Kashechewan First Nation (MNP LPP, 2024b) • Weenusk First Nation (MNP LPP, 2024a)	• Indigenous communities provided information relating to the bird species harvested by community members. In particular: – Aroland First Nation noted that traditional food sources include goose and ruffed grouse (partridge) (Oji-Cree translation, papashki), although in recent years there has been a shift from local to processed food, as well as from harvested to purchased food. – Constance Lake First Nation noted that species harvested include duck and ruffed grouse (partridge) in the Kenogamisis Lake, Kenogamisis River, Goldfield Lake and nearby connecting waterbodies and downstream from the Kenogamisis Lake Dam to the discharge point of the Kenogamisis River to Long Lake at Crib Road and northeast to Kenogamisis Diversion Dam area. – Fort Albany First Nation highlighted site-specific values within the proposed Project's Regional Study Area including habitat and harvesting locations for various wildlife species including Canada geese, snow geese, ducks, and ruffled grouse (partridge). Fort Albany First Nation also notes that grouse are hunted in May and June during the spring break-up – and that this is also the time when the species perform their mating dances. • A member of Kashechewan First Nation highlighted the particular importance of geese and other waterfowl species within their community. Members of Kashechewan First Nation also identified a number of key bird species harvested within their traditional area including ducks (for example, pintail), waterfowl, ruffled grouse (partridge), snipe, snow goose, godwit, and ptarmigan. • Marten Falls First Nation families hunted / hunt waterfowl for food, feathers, and cultural celebrations. This includes species such as geese, duck, and ruffed grouse (partridge). A cultural week break is taken each year (usually at the end of April), by children and most community members for these activities and celebrations. – Weenusk First Nation highlighted an overall cultural importance of geese. The community noted that they primarily hunt geese along the mouth of the Weenusk River on the Hudson's Bay during the spring after ice break-up.

Topic	Indigenous Community	Details
• **Concerns related to Birds**	• Aroland First Nation (Shared Value Solutions, 2024) • Animbiigoo Zaagi'igan Anishinaabek (Stantec, 2017b) • Mushkegowuk Council (Nextbridge Infrastructure, 2018) • Kingfisher Lake First Nation (SNC-Lavalin, 2020) • Marten Falls First Nation (2023b) • Weenusk First Nation, (MNP LPP, 2024a)	• Aroland First Nation noted concerns relating to how increased access to the region may make it easier for people to access harvesting areas, putting additional pressure on wildlife populations, with one community member noting: "The first thing I thought about was the wilderness, the animals would be disturbed. If the road goes through there, they're travelling routes would be disrupted. And also, their feeding might be disrupted. As for the fish, I think if they build bridges and all that, it's easier access for humans to go harvest. To me, that would be very destructive for the wildlife and fishery." • Aroland First Nation noted concerns relating to how increased dust and noise from the road may affect birds, including effects to goose nesting areas. • Several Indigenous communities shared concerns related to potential impacts of contaminants on bird species. This included: – Animbiigoo Zaagi'igan Anishinaabek expressed interest in relation to effects on waterfowl and migratory birds and the potential for contamination of waterfowl. – Indigenous Knowledge shared by Mushkegowuk Council and Kingfisher Lake First Nation included concerns that increased vehicle emissions would lead to ingestion of contaminants by bird Species at Risk. • Concerns shared by Marten Falls First Nation included the those related to dust effects on water, plants, and wildlife (including birds). This included: – Concerns relating to dust and pollution due to increased traffic / pollution in the area as a result of logging activities; – Concerns related to bird habitat and nesting places due to increased logging activities; and – Potential impacts effects onto bird food sources (in other words., fish) due to heightened fishing activities and other anthropogenic activities. • Weenusk First Nation also noted concerns specifically about: – The potential for effects related to air quality as a result of fugitive dust from movement and operations of construction equipment and vehicles; and – Effects to harvestable species within the community's traditional territory as a result of increased access.
• **Caribou Habitat**	• Weenusk First Nation (2023)	• Weenusk First Nation noted that caribou are sometimes forced to move inland for migration due to effects from climate change such as the sudden thaw on the rivers.
• **Culturally Important Species** • **Potential Concerns**	• Marten Falls First Nation (2024a) • Kashechewan First Nation (MNP LPP, 2024b) • Fort Albany First Nation (Firelight Research Inc., 2024) • Nibinamik First Nation (Dillon, 2024a) • Weenusk First Nation (MNP LPP, 2024a)	• Marten Falls First Nation noted caribou and moose have been identified in the area of the Community Access Road, including year-round occurrence of caribou due to open spaces and ample vegetation for feeding. • Additionally, Marten Falls First Nation noted that caribou are most sensitive in spring and summer when calving. • Moose and Caribou were identified as culturally and traditionally important for Marten Falls First Nation. Caribou is not hunted often by the community (not to the same extent as moose), and the community has noted a decline in species numbers in recent years; however, moose meat is often shared with family, Elders, and community members, and almost all parts of the animal are utilized for various purposes. • Fort Albany First Nation highlighted the cultural importance of caribou and moose, noting that these species have helped to shape how community members practice hunting and trapping activities. • Kashechewan First Nation identified the importance of moose, caribou, and deer as key harvested species with a number of moose hunting sites located throughout the Regional Study Area. Moose and caribou are often harvested by following tracks into the bush using snowshoes to prevent lactic acid build-up within the muscles of the animal. • Nibinamik First Nation noted the importance of moose as a traditional food which is harvested by the community. • Weenusk First Nation also noted the overall cultural importance of caribou, noting that the species is a main staple and is harvested year-round.

Topic	Indigenous Community	Details
• **Caribou Distribution** • **Moose Distribution**	• Kashechewan First Nation (MNP LPP, 2024b) • Aroland First Nation (Shared Value Solutions, 2024) • Marten Falls First Nation (2023b) • Fort Albany First Nation (Firelight Research Inc, 2024)	• Kashechewan First Nation noted that caribou and moose populations are healthy and plentiful within the Regional Study Areas, noting an increase in the caribou population near Pike River. • Aroland First Nation described the presence of caribou within the area of water crossings near Kawashkagama River, Kapikotongwa River, as well as the creek connecting Terrier Lake and Hauenstein Lake, and other unnamed creeks. • Aroland First Nation provided details relating to the distribution of caribou, noting presence of the caribou within the area of Patience Lake. • Marten Falls First Nation members have witnessed caribou crossing areas that are within the vicinity of the Project as far back as the 1970s, and having used these habitats for feeding and breeding. • Fort Albany First Nation shared observations of caribou coming out of their protected winter range at the start of the break-up season. One community member noting that thousands of caribou tracks could be seen within the area of Pagashi Lake and Kapisaku River in the springtime. • Fort Albany First Nation also shared that during the winter months (January and February) low temperatures pose challenging conditions, so caribou and moose will utilize wooded / forested areas near frozen muskeg or shalllow river crossings – as these areas often provide cover from predators and food sources (for example, willow and poplar). • Fort Albany First Nation described observing that the seasonal range of caribou species overlaps during freeze-up between November and December. • Weenusk and Kashechewan First Nations requested that a caribou monitoring program be implemented.
• **Moose Habitat**	• Aroland First Nation (Shared Value Solutions, 2024) • Fort Albany First Nation (Firelight Research Inc., 2024) • Marten Falls First Nation (2023b) • Kashechewan First Nation (MNP LPP, 2024b)	• Marten Falls First Nation provided observations related to moose habitat including: – The west side of the proposed Albany River crossings for the Community Access Road towards Washi Lake and Makokibatan Lake provide significant moose habitat composed of highlands, large trees, and thick bush to protect moose from wolves. – Significant moose habitat is found near the Dusey River as moose go here in the fall to feed on red willows, lily pads, and rest in tall grasses along the river. • Members of Kashechewan First Nation shared that caribou and moose populations are healthy and plentiful, within the Regional Study Area, noting observations of a notable increase in the caribou population near Pike River. • Fort Albany First Nation provided observations relating to moose habitat, noting the importance of river ecosystems as habitat features for the species. Community members described that moose are often found along the rivers, as they utilize the water systems to move across the territory. One community member noted that moose gather at the Fork of the Ogoki River to feed and bring their young out in the springtime. Another community member shared that the Albany River and smaller tributaries are utilized for moose hunting including the Ghost River, the Chemahagan River, the Kapiskau River, and the Stooping River – noting that the Albany River Forks provide productive moose for feeding and calving grounds. – "We have been going to the Forks at the Ogoki River….. that is where mostly the moose feeding grounds are. That's why we go there. There's a section in that river, in that area where moose always gather. There is rich — it is rich, their moose — moose diets, so that is where we go for them. …That is where we hit first before we come downriver. …Their feeding ground — moose's feeding grounds. …That is where they'll gather. …When they bring their young out in the springtime." • Fort Albany First Nation also noted a decrease in the presence of moose and therefore moose camps since the 1960s, impacting Fort Albany First Nation's members' relation to culturally significant relationship with moose and moose hunting practices. • Aroland First Nation provided observations relating to moose habitat including: – Observations noting the presence of prime moose habitat within the area where the route alignment would cross the Patigoos River, southwest of Teabeau Lake. – The presence of moose within the areas of Melchett Lake, Tennant Lake, Kapikotongwa Lake, Briarcliffe Lake, Nass Lake, and Durer Lake. – Observations of declines in the moose population at Patience Lake, with one community member noting: ▪ "There was lots of moose. We used to see maybe five, six moose every day when they [parents] were commercial fishing. Now, when we went back there [Patience Lake] about 10 years ago, I don't think I even see one that time." • Aroland First Nation noted the presence of caribou and caribou migration routes within the Community Access Road Study Areas, noting that guidelines for developing road corridors in the known range for this species should be followed to confirm that the species is not further impacted by Project activities. Additionally, the community highlighted the following areas where caribou have been observed: – Water crossings near Kawashkagama River, Kapikotongwa River – The creek connecting Terrier Lake and Hauenstein Lake, and other unnamed creeks; and – Within the area of Patience Lake. • Weenusk First Nation noted that caribou migration routes coincide with the Community Access Road.

Topic	Indigenous Community	Details
• **Caribou and Caribou Habitat**	• Fort Albany First Nation (Firelight Research Inc., 2024)	• Fort Albany First Nation highlighted site-specific values within the proposed Community Access Road's Regional Study Area including habitat and harvesting locations for various wildlife species, caribou, and moose. Information shared by the community also included habitat features such as caribou crossing areas. • Fort Albany First Nation have also highlighted correspondence between the Six-Season Cycle (observed by Fort Albany First Nation) and caribou movement. In particular, the community shared observations of caribou coming out of their protected winter range at the start of the break-up season, which is marked by the rivers opening and ice melting and flowing downstream into James Bay. One community member noted that thousands of caribou tracks could be seen within the area of Pagashi Lake and the Kapiskau River in the springtime. – "…that's why I go caribou hunting right here [Kapiskau River, in the spring]... thousands and thousands and thousands of tracks there... what they do is, during the wintertime they go here. East.... Where there is brush, lots of brush so wolves can't get them... So in the springtime, tend to travel west…"…"I did, I did go here [to Pagashi Lake] one time in the springtime with my uncle. … There's lots of, there's lot of woodland caribou in there. … Bighorn." – Fort Albany First Nation described observations relating to the presence of both boreal and eastern migratory caribou, noting that the seasonal range of each species overlaps during freeze-up between November and December. ▪ "…as far as I know about the caribou, the caribou migration happens in November. There's two different kinds of caribou, the woodlands and then there's a tundra. I'm not really sure, but I think the woodland — the woodland caribou only stay in certain particular….but they do migrate. Then there's the tundra caribou. They come all the way from the tundra area, like Hudson's Bay and stuff, and I believe they can migrate all the way around to the east coast inland. …they cover a lot of land to migrate. That's the caribou. … And they do migrate from the north, the tundra area. And then they walk around, they basically walk around in James Bay…" • Fort Albany First Nation also shared that during the winter months (January and February), low temperatures pose challenging conditions, so caribou and moose will utilize wooded / forested areas near frozen muskeg or shallow river crossings – as these areas often provide cover from predators and food sources (for example, willow and poplar). • Weenusk First Nation noted that calves are not harvested. Additionally, female caribou and moose are not harvested in the Spring to allow the species to reproduce. The community noted that no part of the animal harvested is wasted and every part is used (for example, bone marrow and hide for moccasins and mittens) and that sometimes the entrails are left behind for other animals.
• **Caribou Habitat**	• Weenusk First Nation (2023)	• Weenusk First Nation noted that caribou migration routes coincide with the Community Access Road.
• **Concerns and Mitigation Measures**	• Marten Falls First Nation (2023b)	• Marten Falls First Nation identified concerns including: – Alteration of caribou mating areas. – General overall impacts to animal populations (especially moose and caribou) particularly animal health regarding size of animals. – Concerns that the use of salt on roads may attract moose and caribou and result in vulnerability to animal fatalities due to vehicular collisions and hunters and poachers. • The Community also provided several suggestions for potential mitigation measures including: – Integration of wildlife crossings, particularly for moose, caribou. – Wildlife crossing signs along the Community Access Road. – A suggestion that the Community Access Road being built 1-hour walking distance from mammal habitat, thereby preventing any dams are built in conjunction with the construction of the Community Access Road. – Prohibition of logging or other resource exploitations activities around or near mammal habitat. – Environmental monitoring training provided for Marten Falls First Nation members. – Environmental monitoring to be performed by Marten Falls First Nation.
• **Concerns and Mitigation Measures**	• Marten Falls First Nation (2023b)	• Marten Falls First Nation identified concerns about the negative impacts to wildlife through habitat alteration, affecting hunting and tracking species including moose.
• **Peatlands (Oji-Cree translation, maashkiigwabo) and wetlands noted throughout area**	• Attawapiskat First Nation (Attawapiskat First Nation, 2015)	• Attawapiskat First Nation noted that peatlands in Ontario's Far North store approximately one-third of Ontario's total carbon emissions.
• **Peatlands and wetlands noted throughout area**	• Red Sky Independent Métis Nation (AECOM, 2020b)	• Red Sky Independent Métis Nation noted there are a lot of wetlands in the area.

Topic	Indigenous Community	Details
• **Peatlands and wetlands noted throughout area**	• Marten Falls First Nation (2020)	• Marten Falls First Nation noted that peatlands comprise a large portion of the proposed planning area. The peatlands are important for caribou, nesting areas for sandhill crane (Grus canadensis; Oji-Cree translation, ojihjak) and sharp-tailed grouse (Tympanuchus phasianellus; Oji-Cree translation, ahgusk), and are important for water regulation across the landscape and represent a large amount of stored carbon.
• **Areas of high ground west of the proposed Albany River crossings**	• Marten Falls First Nation (2023b)	• Marten Falls First Nation noted that highlands, on the west side of the proposed Albany River crossings, with large trees and thick bush, help protect moose from wolves.
• **Effect of blasting on cultural / spiritual sites** • **The effect of the development on the natural landscape**	• Marten Falls First Nation (2023b) • Aroland First Nation (Dillon, 2024b)	• Marten Falls First Nation noted concerns that blasting techniques used to break up rock formations as part of road development might negatively affect cultural / spiritual sites; specifically, rocks / bedrock areas with oral histories attached that are of importance to Marten Falls First Nation. The Community noted concerns that development will affect their connection to the land and that activities could alter the natural landscape, thereby impacting the beauty, tranquility, silence, and special places of Marten Falls First Nation's traditional territory. • Other communities including Aroland First Nation also noted concerns about general / overall landscape disturbances.
• **Concerns related to pollution impacts**	• Marten Falls First Nation (2023b)	• Indigenous Knowledge obtained from Marten Falls First Nation noted general concerns and suggested mitigation measures regarding impacts of pollution.

8.2.2 Valued Components of Land

Valued components for each discipline are an element of the environment deemed important by Indigenous peoples, the public, stakeholders, or regulatory bodies. **Section 6.3** describes the valued components that were selected based on information provided by Regulators, through field studies, and incorporation of Indigenous Knowledge. These components can include physical, biological, cultural, or socio-economic aspects of the environment that might be impacted by a proposed project. The valued components, indicators and why they were selected for the land disciplines are provided in **Table 8.2-2**.

Table 8.2-2: Valued Components of Land

Discipline	Valued Component	Indicators	Rationale for Selection	Measures of Change
• Vegetation	• Wetland and Riparian Ecosystems	• Availability (abundance spatially and temporally) • Distribution • Function and Composition	• Cultural, economic, and / or social implications associated with this valued component, where applicable • Provides ecosystems support (habitat for flora, fauna, hydrological functions, air and water purification, carbon, and nitrogen storage) • Habitat for Traditional Use and Species at Risk plants • Indicator of wetland health	• Changes in availability (area in hectares) and distribution within the Local Study Area as well as qualitative assessment of changes to function and composition
• Vegetation	• Upland Ecosystems	• Availability (abundance spatially and temporally) • Distribution • Function and Composition	• Cultural, economic, and / or social implications associated with this valued component, where applicable • Provides ecosystems support (habitat for flora, fauna, hydrological functions, air and water purification, carbon, and nitrogen storage) • Habitat for Traditional Use and Species at Risk Plants	• Changes in availability (area in hectares) and distribution within the Local Study Area as well as qualitative assessment of changes to function and composition
• Vegetation	• Designated Areas (Area of Natural and Scientific Interest, Environmentally Significant Areas, Significant Woodlands, Critical Landform / Vegetation Associations)	• Availability (abundance spatially and temporally) • Distribution • Function and Composition	• Cultural, economic, and / or social implications associated with this valued component, where applicable • Indicator of ecosystem health	• Changes in availability (area in hectares) and distribution within the Local Study Area as well as qualitative assessment of changes to function and composition
• Vegetation	• Traditional Use Plants and Species at Risk Plant Populations (including species with special conservation status or rarity in the province)	• Availability • Distribution • Accessibility	• Species at Risk (federal or provincial) • Cultural, economic, and / or social implications associated with this valued component, where applicable • Measure of ecosystem health	• Changes in availability (area in hectares) and distribution within the Local Study Area as well as an assessment of changes to the accessibility of traditional use species
• Wildlife	• Bats – Little Brown Myotis (Myotis lucifugus; Oji-Cree translation, gaa'osaawisich obikwaanaachiis) – Northern Myotis (Myotis septentrionalis; Oji-Cree translation, gaaginogitawagech obikwaanaachiis)	• Habitat availability: changes to the amount of different quality habitats (for example, hectares), and animal use of available habitat • Distribution: changes to spatial configuration and connectivity of habitats (for example, linear feature density), and the spatial distribution and movement of animals • Survival and Reproduction: changes to animal abundance / wildlife populations from altering survival and / or recruitment	• Species at Risk (both federally under the *Species at Risk Act* and provincially under the *Endangered Species Act*) • International conservation implications are associated with the species	• Species presence and distribution of observations (spatial and temporal) • Relative abundance (spatial and temporal) • Population status • Amount of suitable habitat • Distribution of suitable habitat including critical habitat for Species at Risk • Habitat connectivity / movement corridors • Den site selection and use (for wolverine) • Disruption of breeding behaviour (during and after construction) • Changes in mortality (due to increased anthropogenic [human-caused] stresses [for example, vehicle travel]) • Movement capacity • Predation risk • Prey abundance and distribution • Reproductive capacity

Discipline	Valued Component	Indicators	Rationale for Selection	Measures of Change
• Wildlife	• Furbearers – American Marten (Martes americana) – Beaver – Wolverine (Gulo gulo; Oji-Cree translation, wishkobish, wiingwa'waake)	• Habitat availability: changes to the amount of different quality habitats (for example, hectares), and animal use of available habitat • Distribution: changes to spatial configuration and connectivity of habitats (for example, linear feature density), and the spatial distribution and movement of animals • Survival and Reproduction: changes to animal abundance / wildlife populations from altering survival and / or recruitment	• Wolverine is a Species at Risk (both federally under *Species at Risk Act* and provincially under the *Endangered Species Act*) • All three species have cultural significance as well as economic and social implications with this valued component	• Species presence and distribution of observations (spatial and temporal) • Relative abundance (spatial and temporal) • Population status • Amount of suitable habitat • Distribution of suitable habitat including critical habitat for Species at Risk • Habitat connectivity / movement corridors • Den site selection and use (for wolverine) • Disruption of breeding behaviour (during and after construction) • Changes in mortality (due to increased anthropogenic [human-caused] stresses [for example, harvest, vehicle travel]) • Movement capacity • Predation risk • Prey abundance and distribution • Reproductive capacity
• Wildlife	• Amphibians and Reptiles	• Habitat availability: changes to the amount of different quality habitats (for example, hectares), and animal use of available habitat • Distribution: changes to spatial configuration and connectivity of habitats (for example, linear feature density), and the spatial distribution and movement of animals • Survival and Reproduction: changes to animal abundance / wildlife populations from altering survival and / or recruitment	• Cultural significance as well as economic and social implications with this valued component	• Species presence and distribution of observations (spatial and temporal) • Relative abundance (spatial and temporal) • Population status • Amount of suitable habitat • Distribution of suitable habitat including critical habitat for Species at Risk • Habitat connectivity / movement corridors • Den site selection and use (for wolverine) • Disruption of breeding behaviour (during and after construction) • Changes in mortality (due to increased anthropogenic [human-caused] stresses [for example, harvest, vehicle travel]) • Movement capacity • Predation risk • Prey abundance and distribution • Reproductive capacity
• Wildlife	• Pollinating Insects	• Habitat availability: changes to the amount of different quality habitats (for example, hectares), and animal use of available habitat • Distribution: changes to spatial configuration and connectivity of habitats (for example, linear feature density), and the spatial distribution and movement of animals • Survival and Reproduction: changes to animal abundance / wildlife populations from altering survival and / or recruitment	• Significant role in the food web and pollination of plant species • Input received during consultation with Marten Falls First Nation	• Species presence and distribution of observations (spatial and temporal) • Relative abundance (spatial and temporal) • Population status • Amount of suitable habitat • Distribution of suitable habitat including critical habitat for Species at Risk • Habitat connectivity / movement corridors • Den site selection and use (for wolverine) • Disruption of breeding behaviour (during and after construction)

Discipline	Valued Component	Indicators	Rationale for Selection	Measures of Change
				• Changes in mortality (due to increased anthropogenic [human-caused] stresses [for example, harvest, vehicle travel]) • Movement capacity • Predation risk • Prey abundance and distribution • Reproductive capacity
• Birds	• Forest Birds – Red-Eyed Vireo (Vireo olivaceus; Oji-Cree translation, misko-binechiinch gaanitaanigamoch) – Ovenbird (Seiurus aurocapilla; Oji-Cree translation, binechiinch ganitanigamoch) – Dark-Eyed Junco (Junco hyemalis; Oji-Cree translation, binechiinch gaanitaanigamoch)	• Habitat availability • Distribution • Abundance	• Red-Eyed Vireo is representative of deciduous forest habitat types and functional role in ecosystem • Ovenbird is representative of mixed forest habitat types and functional role in ecosystem • Dark-Eyed Junco is representative of coniferous and disturbed (such as, forestry or fire) forest habitat types and functional role in ecosystem	• Species presence and distribution of observations (spatial and temporal) • Relative abundance (spatial and temporal) • Population status • Amount of suitable habitat (spatial and temporal) • Distribution of suitable habitat and habitat fragmentation (spatial and temporal) • Movement capacity • Predation / hunting risk • Prey abundance and distribution • Other threats to bird survival (for example, nest parasitism, collisions with human infrastructure) • Reproductive capacity
• Birds	• Raptors – Osprey – Boreal Owl (Aegolius funereus; Oji-Cree translation, kookookoo)	• Habitat availability • Distribution • Abundance	• Ospreys are representative of diurnal raptors and functional role in ecosystem • Ospreys hold cultural and social significance • Boreal Owls are representative of nocturnal raptors and functional role in ecosystem	• Species presence and distribution of observations (spatial and temporal) • Relative abundance (spatial and temporal) • Population status • Amount of suitable habitat (spatial and temporal) • Distribution of suitable habitat and habitat fragmentation (spatial and temporal) • Movement capacity • Predation / hunting risk • Prey abundance and distribution • Other threats to bird survival (for example, nest parasitism, collisions with human infrastructure) • Reproductive capacity
• Birds	• Shorebirds – Wilson’s Snipe (Gallinago delicata; Oji-Cree translation, nibiikaang gaa’ayaach binechiinch)	• Habitat availability • Distribution • Abundance	• Wilson’s Snipe are representative of shorebird species and functional role in ecosystem	• Species presence and distribution of observations (spatial and temporal) • Relative abundance (spatial and temporal) • Population status • Amount of suitable habitat (spatial and temporal) • Distribution of suitable habitat and habitat fragmentation (spatial and temporal) • Movement capacity • Predation / hunting risk • Prey abundance and distribution • Other threats to bird survival (for example, nest parasitism, collisions with human infrastructure) • Reproductive capacity

Discipline	Valued Component	Indicators	Rationale for Selection	Measures of Change
• Birds	• Waterfowl and Waterbirds – Mallard	• Habitat availability • Distribution • Abundance	• Ecological, cultural, and socio-economic importance • Representative species for effects on other waterfowl that use wetlands and adjacent uplands for breeding • Representative of species identified as important by Indigenous communities including Canada goose, snow goose, and swan • Representative of species identified as food sources for Indigenous communities including Canada goose, snow goose, blue goose, brant, black duck, northern pintail, common loon, red-throated loon, and swan	• Species presence and distribution of observations (spatial and temporal) • Relative abundance (spatial and temporal) • Population status • Amount of suitable habitat (spatial and temporal) • Distribution of suitable habitat and habitat fragmentation (spatial and temporal) • Movement capacity • Predation / hunting risk • Prey abundance and distribution • Other threats to bird survival (for example, nest parasitism, collisions with human infrastructure) • Reproductive capacity
• Birds	• Bog / Fen Birds and Other Wetland Birds – Palm Warbler (Setophaga palmarum; Oji-Cree translation, binechiinch gaanitaanigamoch) – Common Yellowthroat (Geothlypis trichas; Oje-Cree translation, binechiinch gaanitaanigamoch) – Northern Waterthrush (Parkesia noveboracensis; Oji-Cree translation, nibiikaang gaa'ayaach binechiinch) – Sora (Porzana carolina; Oji-Cree translation, gaagweshkoshiich binechiinch)	• Habitat availability • Distribution • Abundance	• Palm Warblers are representative of bog habitat types and functional role in ecosystem • Common Yellowthroats are representative of fen habitat types and functional role in ecosystem • Northern Waterthrush are representative of swamp habitat types and functional role in ecosystem • Sora are representative of marsh habitat types and functional role in ecosystem	• Species presence and distribution of observations (spatial and temporal) • Relative abundance (spatial and temporal) • Population status • Amount of suitable habitat (spatial and temporal) • Distribution of suitable habitat and habitat fragmentation (spatial and temporal) • Movement capacity • Predation / hunting risk • Prey abundance and distribution • Other threats to bird survival (for example, nest parasitism, collisions with human infrastructure) • Reproductive capacity
• Birds	• Species at Risk Birds – Canada Warbler (Cardellina canadensis; Oji-Cree translation, gaamakatew bebeshisich binechiinch) – Chimney Swift (Chaetura pelagica; Oji-Cree translation - gondaaganaabikoong gaadashiiyayaach binechiinch) – Common Nighthawk (Chordeiles minor; Oji-Cree translation, dibiki binechii) – Eastern Whip-poor-will (Antrostomus vociferus; Oji-Cree translation, gaamajaachimoch binechinch) – Eastern Wood-pewee (Contopus virens; Oji-Cree translation, gaagigiweshkitwech binechiinch) – Evening Grosbeak (Coccothraustes vespertinus; Oji-Cree translation, gaa'onaagoshi nigamoch binechiinch) – Olive-Sided Flycatcher (Contopus cooperi; Oji-Cree translation, gaagweshkoshiich binechiinch) – Bald Eagle	• Habitat availability • Distribution • Abundance	• Species at Risk • Bald Eagles and Peregrine Falcons have cultural and social significance • Peregrine Falcons are representative of gyrfalcon, a diurnal raptor identified as important by Indigenous communities	• Species presence and distribution of observations (spatial and temporal) • Relative abundance (spatial and temporal) • Population status • Amount of suitable habitat (spatial and temporal) • Distribution of suitable habitat and habitat fragmentation (spatial and temporal) • Movement capacity • Prey abundance and distribution • Other threats to bird survival (for example, nest parasitism, collisions with human infrastructure) • Reproductive capacity

Discipline	Valued Component	Indicators	Rationale for Selection	Measures of Change
	– Peregrine Falcon (Falco peregrinus; Oji-Creek translation, gaagishiiyaashich migiziiw binechiinch) – Short-Eared Owl (Asio flammeus; Oji-Cree translation, gaayaagaachitawaagech kookookohoo) – Bank Swallow (Riparia riparia; Oji-Cree translation, gaa'osaaw bebeshi aakiganech binechiinchechench) – Barn Swallow (Hirundo rustica; Oji-Cree translation, gaanawachwebamaach manichooshan binechiinch) – Black Tern (Chlidonias niger; Oji-Cree translation, gichisaga'iiganing gaadaashiyayaach binechiinch) – Lesser Yellowlegs (Tringa flavipes; Oji-Cree translation, gaa'osaaw gaatech binechiinchlesser) – Rusty Blackbird (Euphagus carolinus; Oji-Cree translation, makadew binechiinch) – Yellow Rail (Coturnicops noveboracensis; Oji-Cree translation, egaawiikaa gaanagosich binechiinch)			
• Ungulates	• Caribou, boreal population	• Habitat availability (quantity and quality) • Habitat distribution (arrangement and connectivity) • Survival and reproduction	• "Threatened" species on federal *Species at Risk Act* and on provincial *Endangered Species Act* • Act as a representative species for eastern migratory caribou • Act as umbrella species for other large, wide-ranging wildlife and regional biodiversity • Relies on large areas of well-connected mature coniferous forests and bog / fen habitats • Caribou are considered a species of significance to many First Nation communities	• Changes in the amount of different quality habitats and animal use of available habitat • Changes in the spatial configuration and connectivity of habitats and spatial distribution and movement of animals • Changes in animal abundance from altering survival and / or recruitment
• Ungulates	• Moose	• Habitat availability (quantity and quality) • Habitat distribution (arrangement and connectivity) • Survival and reproduction	• Represent key sources of protein and energy for large carnivores and scavengers in boreal forest environments • Strong influence on dynamics and persistence of moose populations • Large home ranges • Traditional use and cultural importance for Indigenous peoples	• Changes in the amount of different quality habitats and animal use of available habitat • Changes in the spatial configuration and connectivity of habitats and spatial distribution and movement of animals • Changes in animal abundance from altering survival and / or recruitment
• Physiography, Soils and Terrain	• Physiography, Terrain, and Soils	• Quantity and distribution of terrain units, which includes surficial materials, topography, and slope stability • Quantity and distribution of soil map units • Soil quality (such as, productivity, reclamation suitability)	• Provide physical structure and foundation for aquatic and terrestrial ecosystems	• Quantity (area in hectares) and distribution • Changes in physical properties of soils (for example, admixing and compaction)

8.2.3 Spatial Boundaries of Land Disciplines

As part of the assessment of existing conditions for the Community Access Road, discipline-specific study areas were developed for the land disciplines, to account for the potential impacts of the road. The study areas for each land discipline are defined in **Table 8.2-3** and on **Figure 8.2-1** to **Figure 8.2-6**.

Table 8.2-3: Spatial Boundaries of Land Disciplines

Discipline(s)	Construction Disturbance Area	Local Study Area	Regional Study Area
• **Vegetation**	• Includes the Project footprint (the linear road corridor itself) and 100-metre-wide right-of-way and associated infrastructure (temporary construction access roads, work areas, worker camps, and pits, quarries, and temporary access roads) for each route alternative (such as, Alternative 1 and Alternative 4). • Area Size: 12,655 hectares	• Includes the Construction Disturbance Area, and extends approximately 3-kilometre on either side of the centreline of the Community Access Road route alternatives and a 500-metre buffer around areas of the associated infrastructure falling outside of the original Local Study Area defined in the Study Plan. • Area Size: 197,960 hectares	• Includes the Construction Disturbance Area and an 11-kilometre buffer on either side of the centreline of the route alternatives. • Area Size: 662,043 hectares
• **Wildlife (non-ungulate, non-bird, non-wolverine)**	• Includes the Project footprint and 100-metre-wide right-of-way and associated infrastructure (temporary construction access roads, work areas, worker camps, and pits, quarries, and temporary access roads) for each route alternative (such as, Alternative 1 and Alternative 4). • Area Size: 12,655 hectares	• Includes the Construction Disturbance Area plus a 3-kilometre buffer. • Area Size: 247,958 hectares	• Includes the Construction Disturbance Area and an 11-kilometre buffer on either side of the centreline of the route alternatives. • Area Size: 662,043 hectares
• **Wolverine**	• Includes the Project footprint and 100-metre-wide right-of-way and associated infrastructure (temporary construction access roads, work areas, worker camps, and pits, quarries, and temporary access roads) for each route alternative (such as, Alternative 1 and Alternative 4). • Area Size: 12,655 hectares	• Includes the Construction Disturbance Area plus a 10-kilometre buffer. • Area Size: 613,732 hectares	• Includes all wildlife management units that intersect with the Wolverine Local Study Area. • Area Size: 16,139,060 hectares
• **Birds**	• Includes the Project footprint and 100-metre-wide right-of-way and associated infrastructure (temporary construction access roads, work areas, worker camps, and pits, quarries, and temporary access roads) for each route alternative (such as, Alternative 1 and Alternative 4). • Area Size: 12,655 hectares	• Includes the Construction Disturbance Area plus a 3-kilometre buffer. • Area Size: 247,958 hectares	• Includes the Construction Disturbance Area plus an 11-kilometre buffer on either side of the centreline of the route alternatives. • Area Size: 662,043 hectares
• **Ungulates**	• Includes the Project footprint and 100-metre-wide right-of-way and associated infrastructure (temporary construction access roads, work areas, worker camps, and pits, quarries, and temporary access roads) for each route alternative (such as, Alternative 1 and Alternative 4). • Area Size: 12,655 hectares	• Includes the Construction Disturbance Area and extends approximately 10-kilometres beyond. • Area Size: 613,732 hectares	• Caribou Regional Study Area intersects four caribou ranges (Missisa range, Nipigon Range, Ozhiski range and Pagwachuan Range). • Area Size: 19,250,753 hectares • Moose Regional Study Area includes all wildlife management units that intersect the Local Study Area. The geographic extent for the Moose Regional Study Area aligns with the Wolverine Regional Study Area (an infrequent predator of moose) and captures the moose population at an ecologically appropriate scale to assess the dynamics between wolves, moose and caribou in the region. • Area Size: 16,139,060 hectares
• **Physiography, Terrain and Soils**	• Includes the Project footprint and 100-metre-wide right-of-way and associated infrastructure (temporary construction access roads, work areas, worker camps, and pits, quarries, and temporary access roads) for each route alternative (such as, Alternative 1 and Alternative 4). • Area Size: 12,655 hectares	• Includes the Construction Disturbance Area and a 3-kilometre buffer on either side of the centreline for Alternative 1 and 4, 500-metre buffer around areas of the associated infrastructure falling outside of the original Local Study Area defined in the Study Plan. • Area Size: 197,960 hectares	• Includes 8-kilometre buffer of the Local Study Area, which includes an 11-kilometre buffer on either side of the centreline of Alternative 1 and Alternative 4. • Area Size: 587,762 hectares

Figure 8.2-1: Vegetation Existing Conditions Local and Regional Study Area

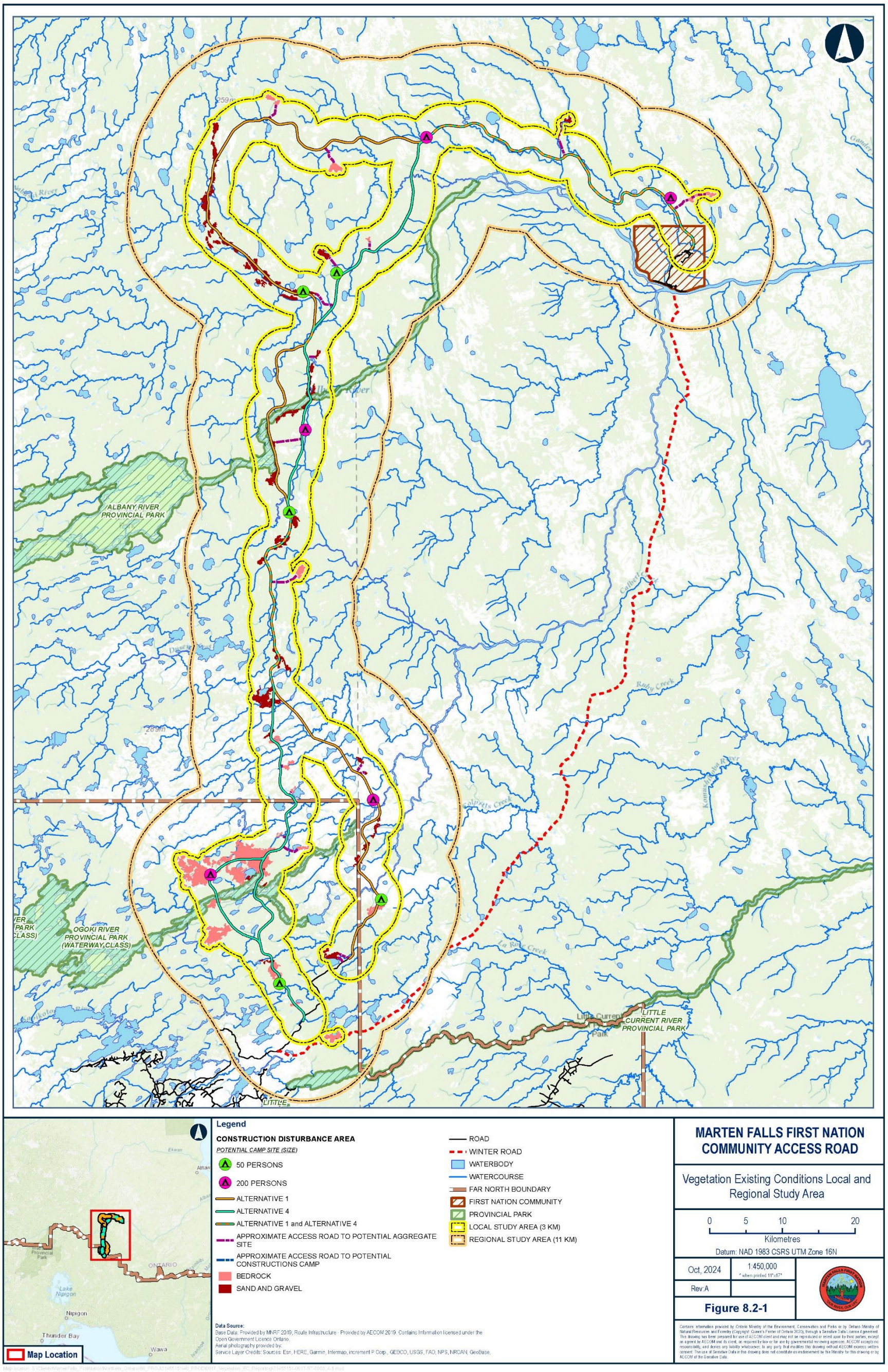


Figure 8.2-2: Wildlife Existing Conditions Local and Regional Study Area

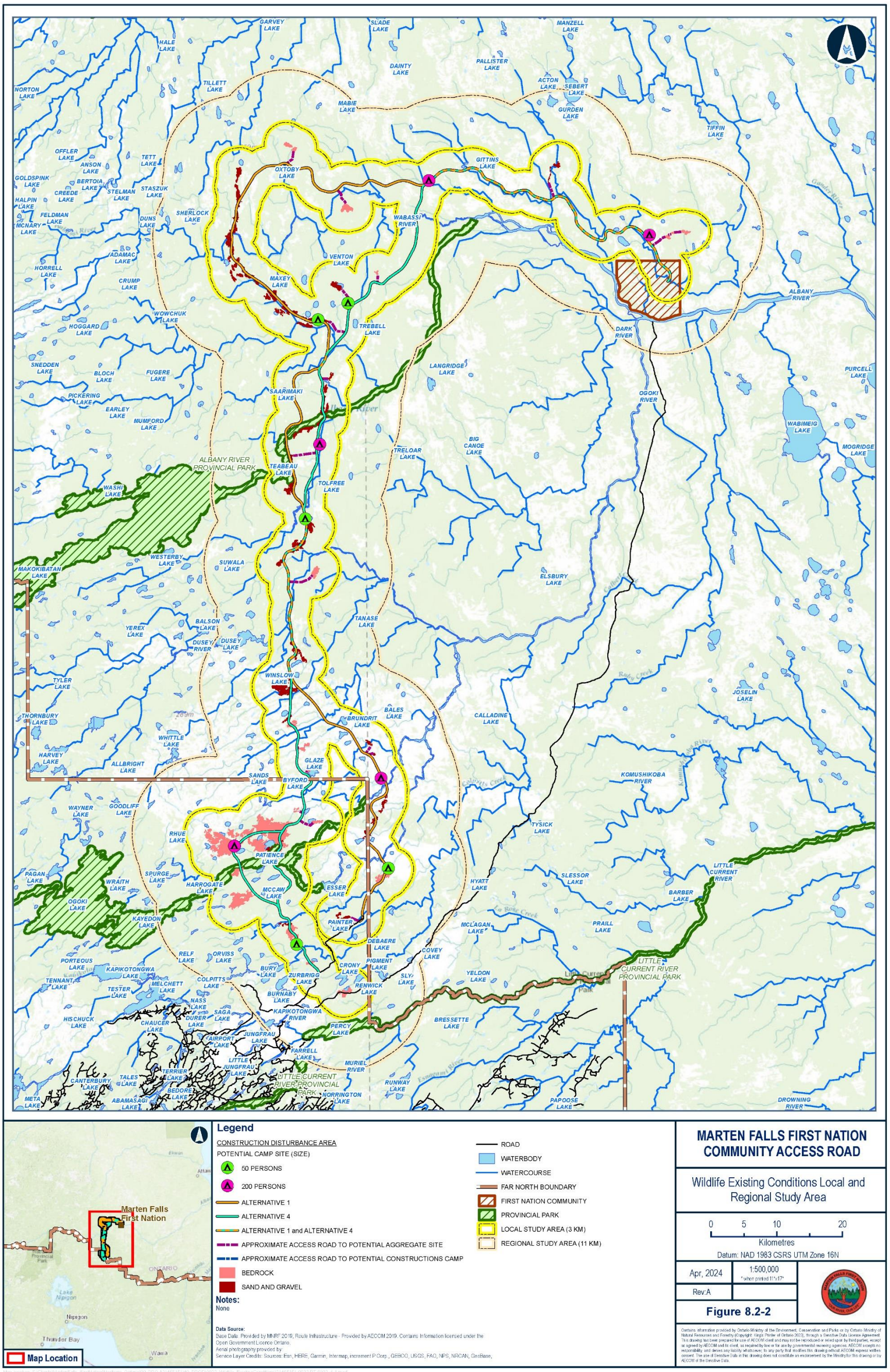


Figure 8.2-3: Wolverine Existing Conditions Local and Regional Study Area

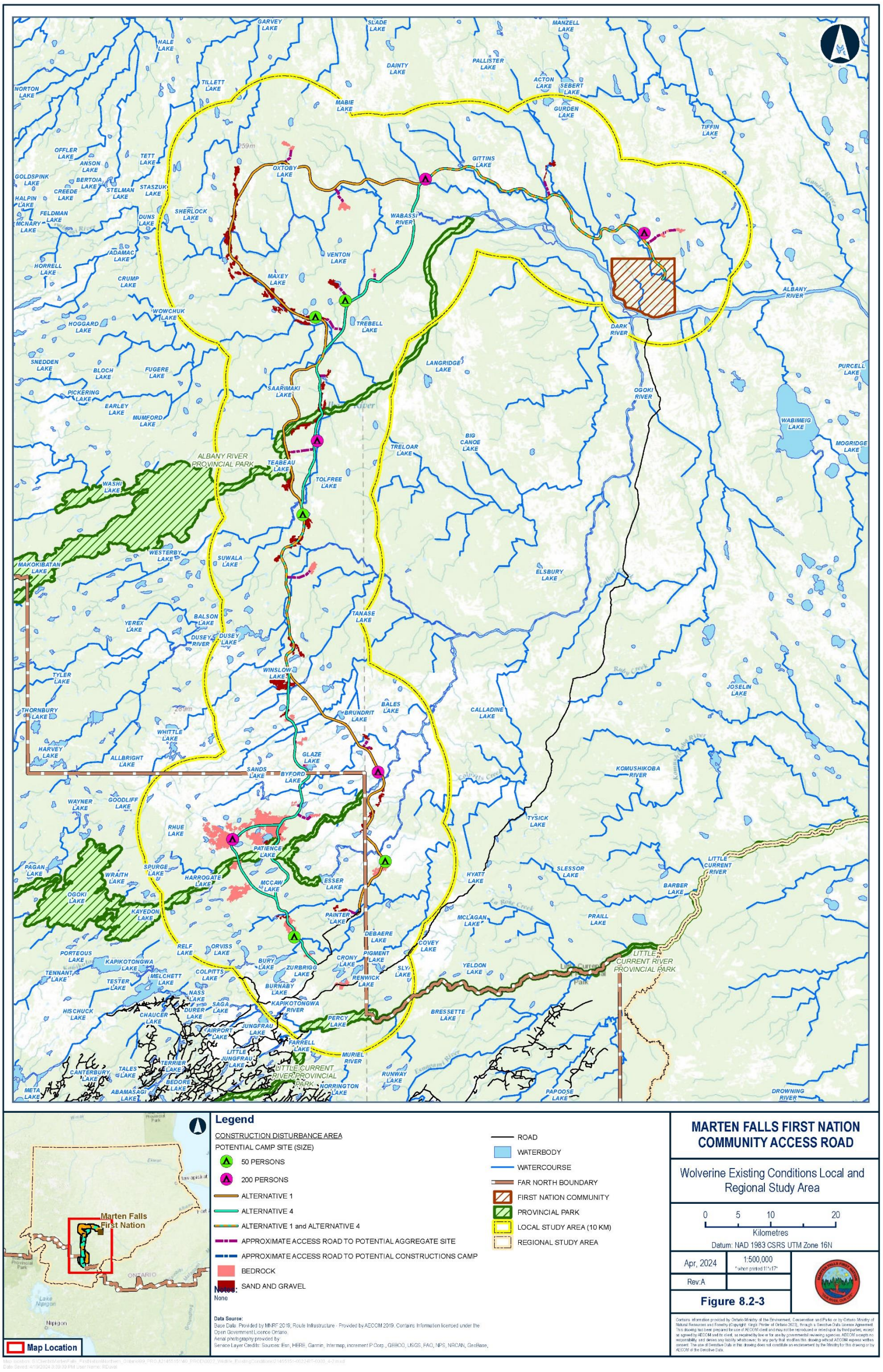


Figure 8.2-4: Birds Existing Conditions Local and Regional Study Area

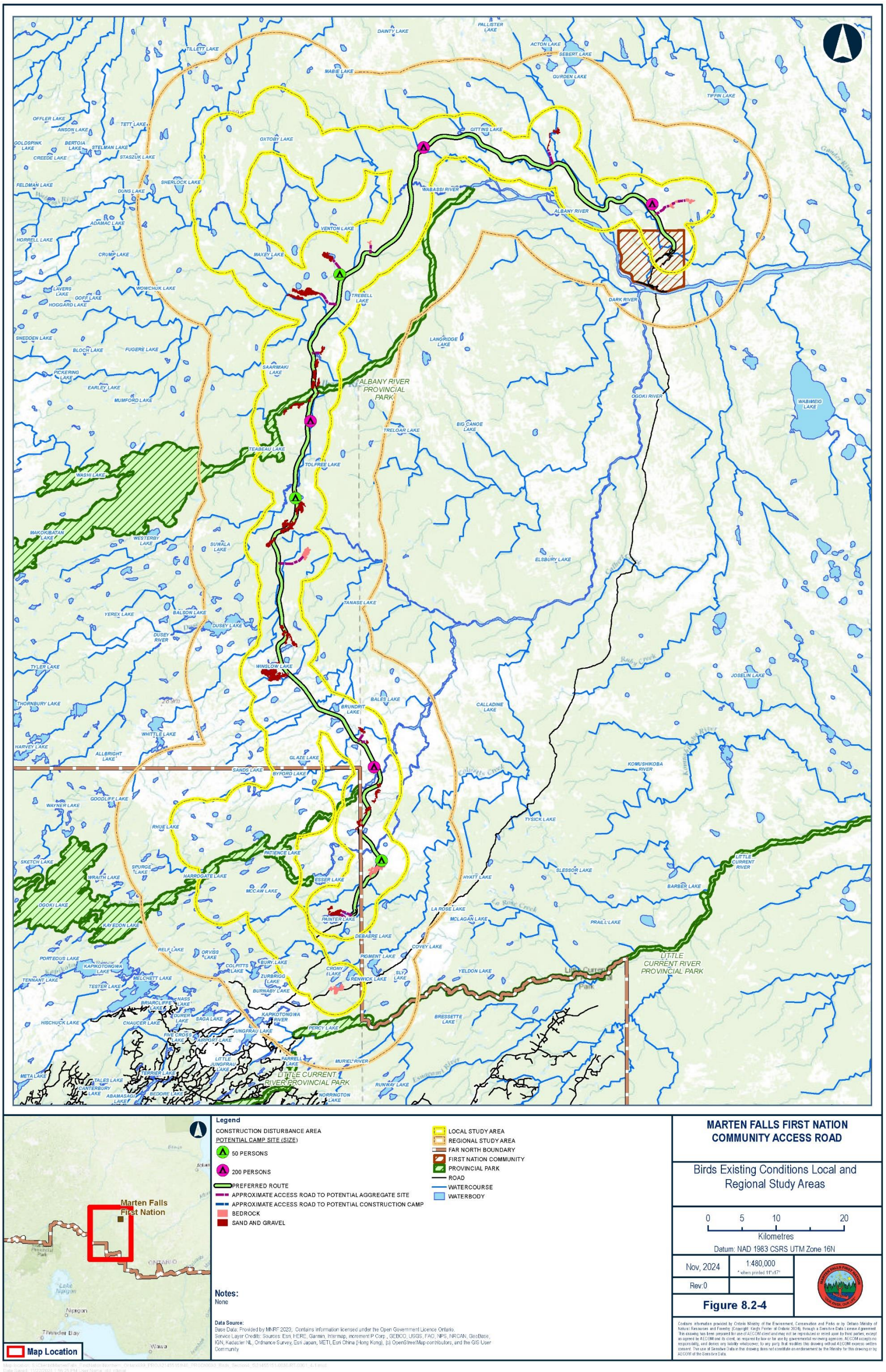


Figure 8.2-5: Ungulates Existing Conditions Local Study Area, Caribou and Moose Regional Study Area

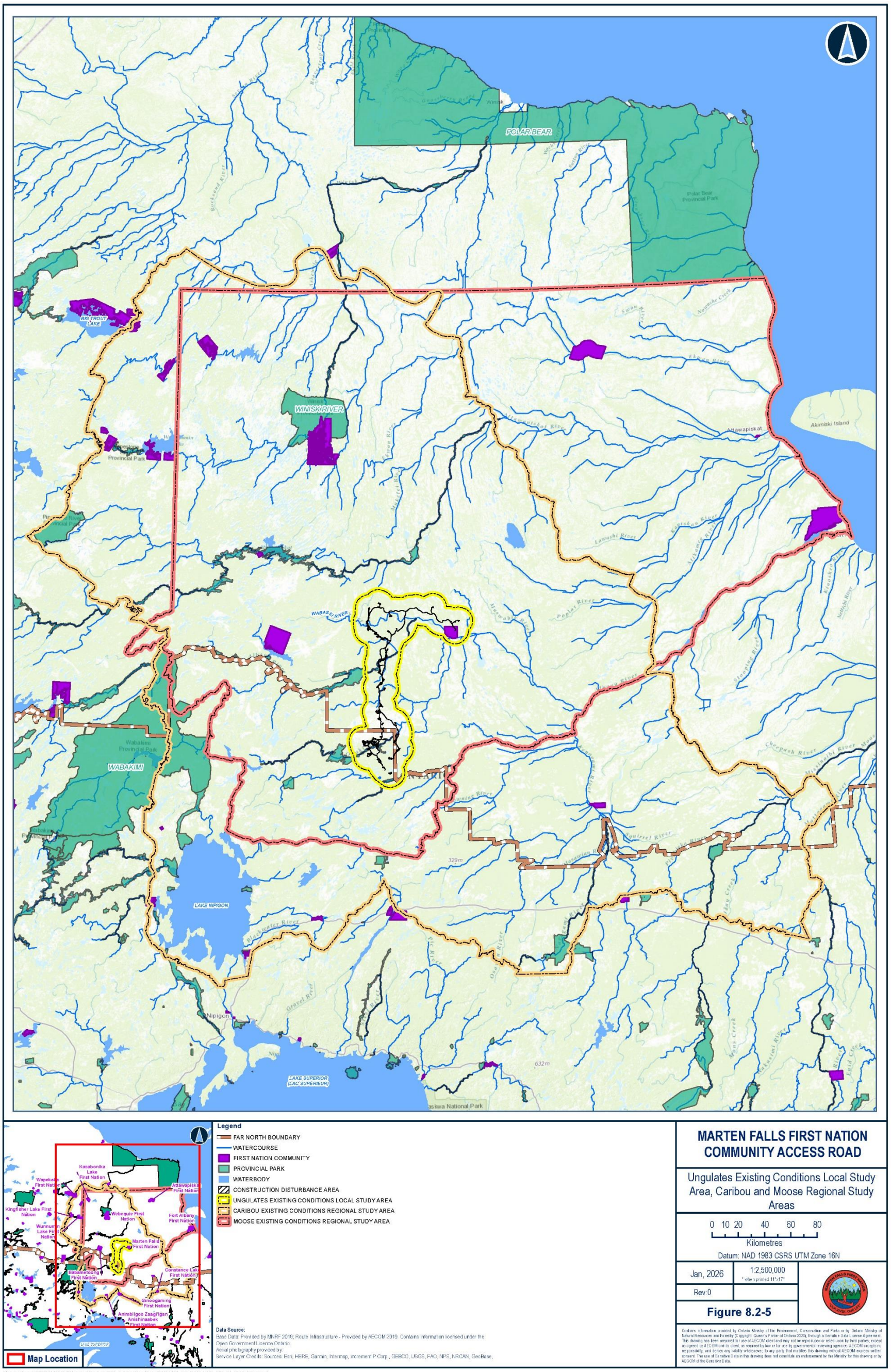
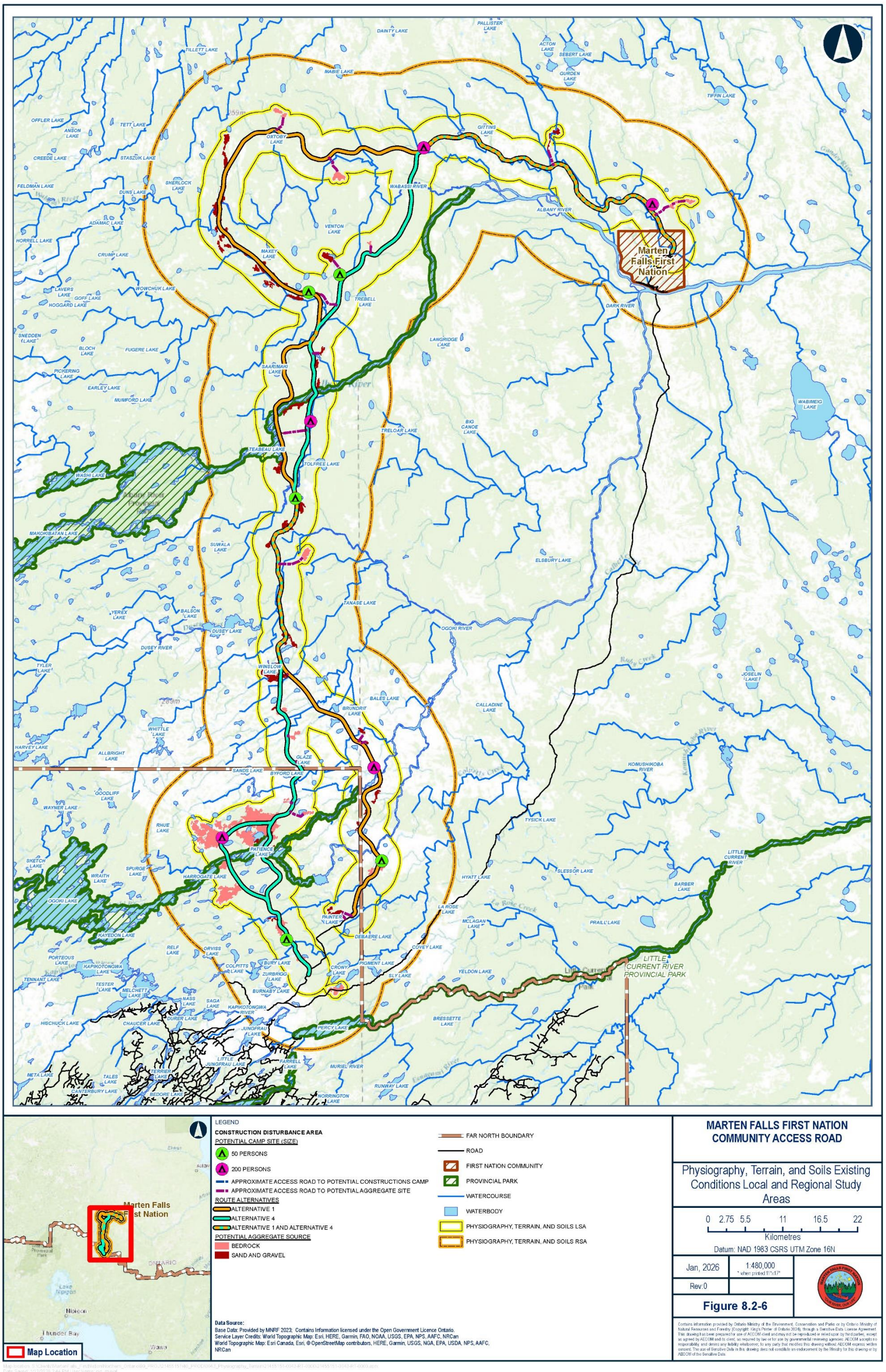


Figure 8.2-6: Physiography, Terrain, and Soils Existing Conditions Local and Regional Study Area



8.2.4 Vegetation

Existing vegetation conditions were studied through review of available information and a multi-year field program to gather soil and plant data was conducted. The desktop review involved collecting data from provincial databases, maps, guidance documents, reports, and other publicly available sources. This information helped create a preliminary map showing different types of ecosystems and vegetation communities. Field teams then selected specific areas to examine in detail, focusing on three main ecosystem types found in the Construction Disturbance Area and Local Study Area: upland (above flood zones), wetland, and riparian (within 30 metres of waterbodies) ecosystems.

Traditional use plants were selected and studied using both oral and written knowledge from Marten Falls First Nation, the Eabametoong First Nation's Biodiversity Atlas (Eabametoong First Nation et al., no date), and the Tailored Impact Statement Guidelines (Impact Assessment Agency of Canada, 2020a). The study looked at whether habitats were suitable for these plants and if the areas were accessible for traditional plant harvesting. Information through discussions with Indigenous communities were also gathered.

Field investigations took place between 2021 and 2023. Two types of field investigation were completed:

- **Ground inspections:** specific vegetation communities were identified through desktop research. Field crews then visited these locations to collect vegetation samples and confirm or adjust the ecosite classification. Ecosites are determined by physical features like slope, sand, and rock, which influence plant growth. Crews also took photos and gathered additional information such as canopy height, soil texture, moisture levels, and the presence of standing dead trees and fallen logs. Special attention was given to documenting federal and provincial Species at Risk, traditional use plants, and rare plants; and
- **Visual checks:** these assessments were done from helicopters or through photos taken during other field programs such as bird surveys.

The complete description of vegetation existing conditions is documented in the Vegetation Technical Support Document (**Appendix J**).

8.2.4.1 Landscape Ecology

The Community Access Road intersects two of Ontario's ecozones: the Ontario Shield and the Hudson Bay Lowlands (Crins et al., 2009). Approximately 85 percent of the existing conditions Local Study Area occurs in the Ontario Shield ecozone, and 15 percent occurs within the Hudson Bay Lowlands. However, much of the existing conditions Local Study Area contained within the Ontario Shield ecozone has similar geomorphological characteristics to the Hudson Bay Lowlands. The details of the two ecozones are summarized as follows:

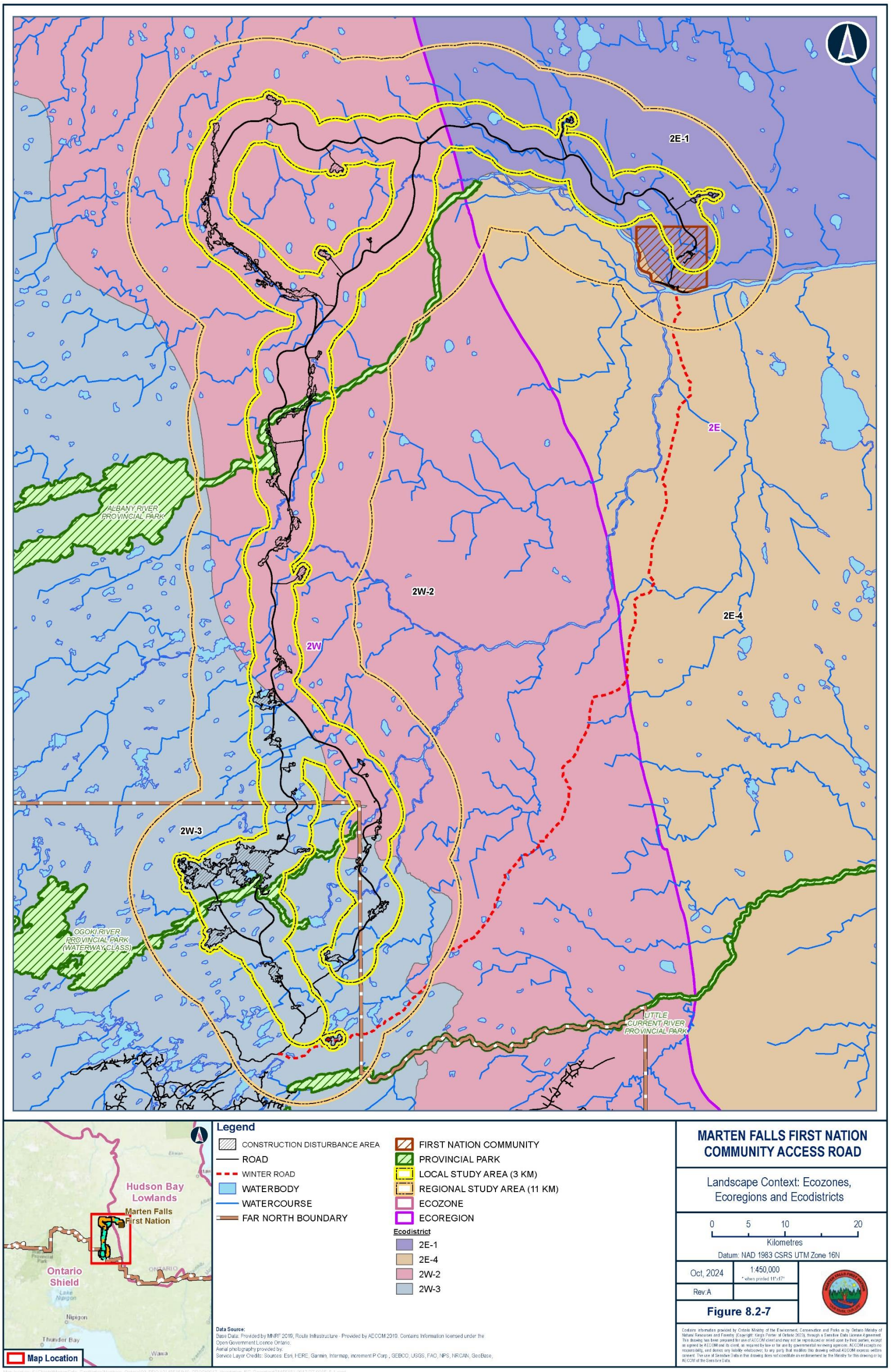
The Project study areas cross two of Ontario's ecozones: the Ontario Shield and the Hudson Bay Lowlands (Crins et al., 2009). About 85 percent of the Local Study Area is in the Ontario Shield ecozone, while 15 percent is in the Hudson Bay Lowlands. However, much of the Ontario Shield area shares similar land features with the Hudson Bay Lowlands. Below is a summary of the characteristics of these two ecozones.

Ontario Shield ecozone is divided into nine ecoregions. Most of the Local Study Area is in Ecoregion 2W (Big Trout Lake [Oji-Cree translation, Kitchenuhmaykoosib Inninuwug]). Within this, it intersects Ecodistricts 2W-2 and 2W-3. The southern part of 2W-2 (Kasabonika Lake) is mainly conifer forests with organic deposits over calcareous material. The southern end of 2W-3 (Wunnumin Lake) has exposed bedrock with a thin layer of mineral material and is also dominated by conifer forests (Crins et al., 2009; Wester et al., 2018).

Hudson Bay Lowlands Ecozone is divided into six ecoregions. The Local Study Area crosses part of the western corner of Ecoregion 2E (James Bay Ecoregion). Within this, it enters Ecodistrict 2E-1 (Albany River) and touches the northwestern border of 2E-4 (Lower Kenogami River). Ecodistrict 2E-1 is mostly flat with fen and bog complexes and some conifer forests. Ecodistrict 2E-4 is characterized by uniform peatlands with little topographic variation (Wester et al., 2018).

Figure 8.2-7 shows the locations of the ecozones in relation to the study area.

Figure 8.2-7: Landscape Context: Ecozones, Ecoregions, and Ecodistricts



8.2.4.2 Vegetation Communities

The Local Study Area is mostly made up of wetland ecosystems, covering 73 percent (145,206.9 hectare). Upland ecosystems make up 23 percent (45,193.5 hectare), waterbodies account for 4 percent (7,507 hectare), and human-altered lands are less than 0.1 percent (53.0 hectare). **Table 8.2-4** summarizes the ecosystems within the Local and Regional Study Areas, and these areas are shown on **Figure 8.2-8**.

Table 8.2-4: Availability of Upland and Wetland Ecosystems Within the Existing Conditions Study Areas

Ecosystem	Local Study Area (hectare)	Local Study Area (percent)	Regional Study Area (hectare)	Regional Study Area (percent)
Upland	45,194	23	112,457	19
Wetland	145,207	73	397,320	68
Water	7,507	4	31,359	5
Human-Altered	53	Less than 1	46,624	8
Other (Footnote a)	Not applicable	Not applicable	2.0	Less than 1
Total	**197,961**	**100**	**587,762**	**100**

Footnotes: Totals may vary slightly due to rounding.

(a) Far North Land Cover - Data Specification, Version 1.4 (Ontario Ministry of Natural Resources and Forestry, 2009) describes “Other” as: “and cover features that were not classified for a variety of reasons.”

Figure 8.2-8: Existing Conditions – Upland Ecosystems, Wetland Ecosystems and Riparian Ecosystems

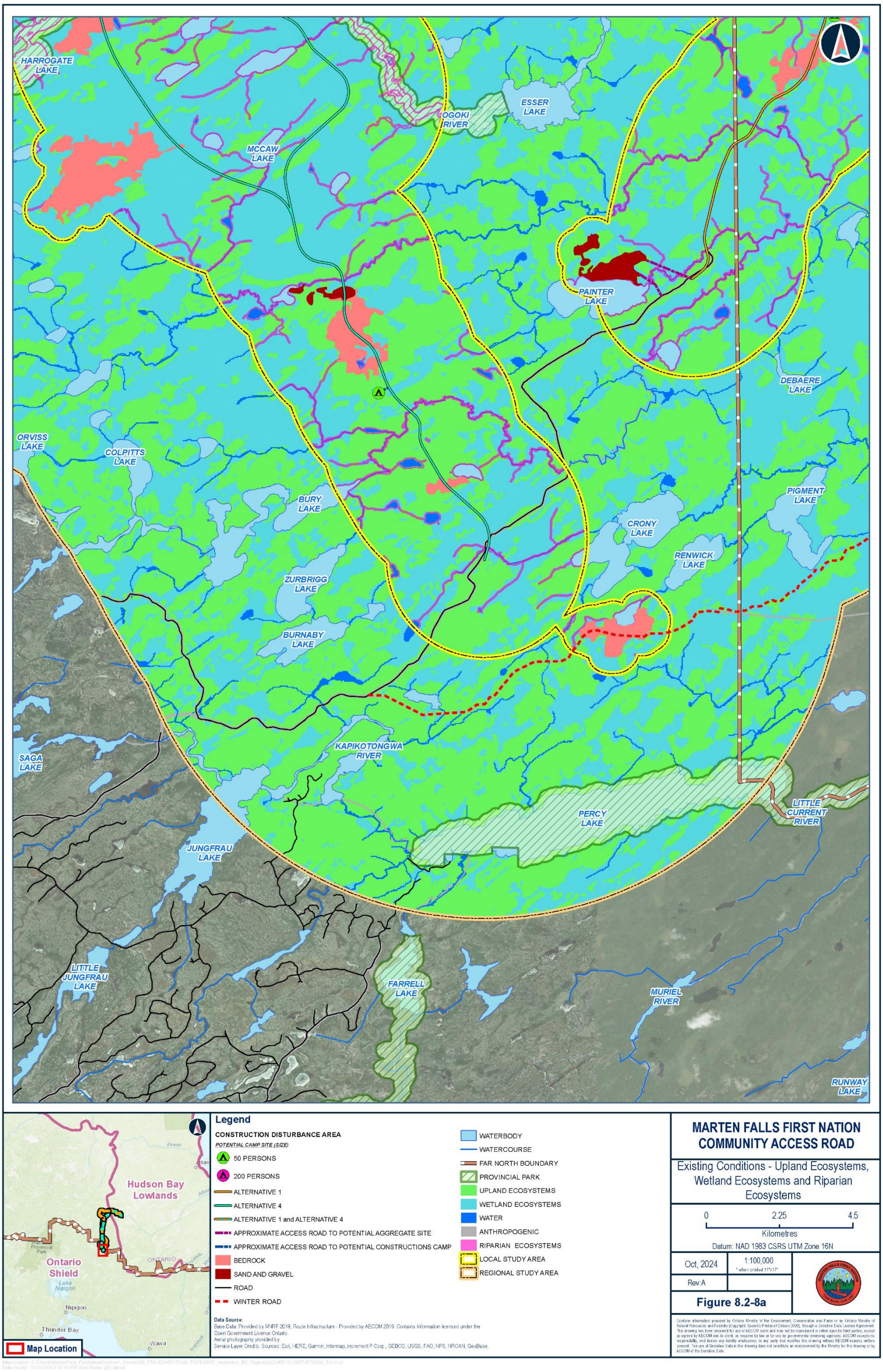


Figure 8.2-8b: Existing Conditions – Upland Ecosystems, Wetland Ecosystems and Riparian Ecosystems

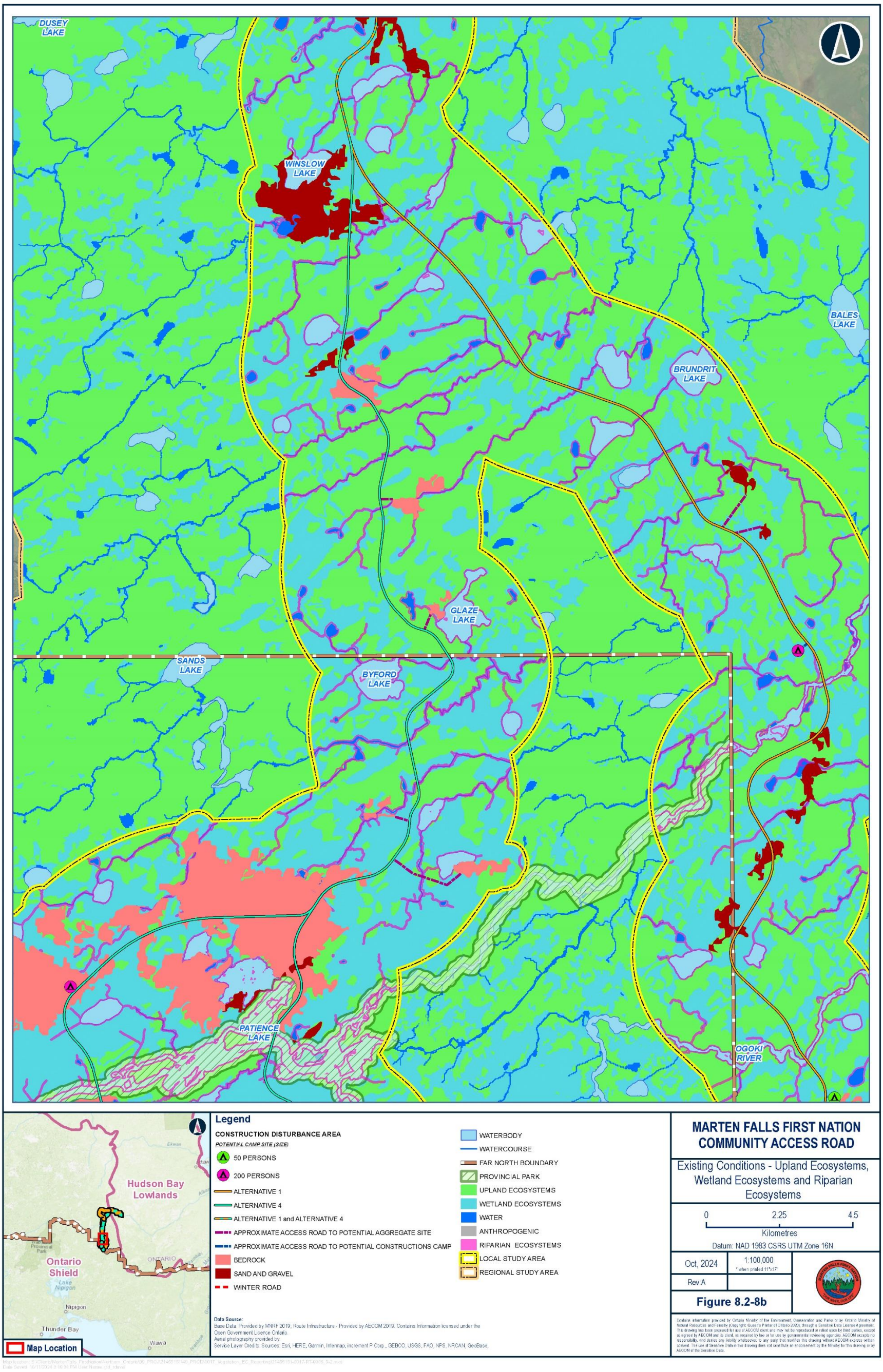


Figure 8.2-8c: Existing Conditions – Upland Ecosystems, Wetland Ecosystems and Riparian Ecosystems

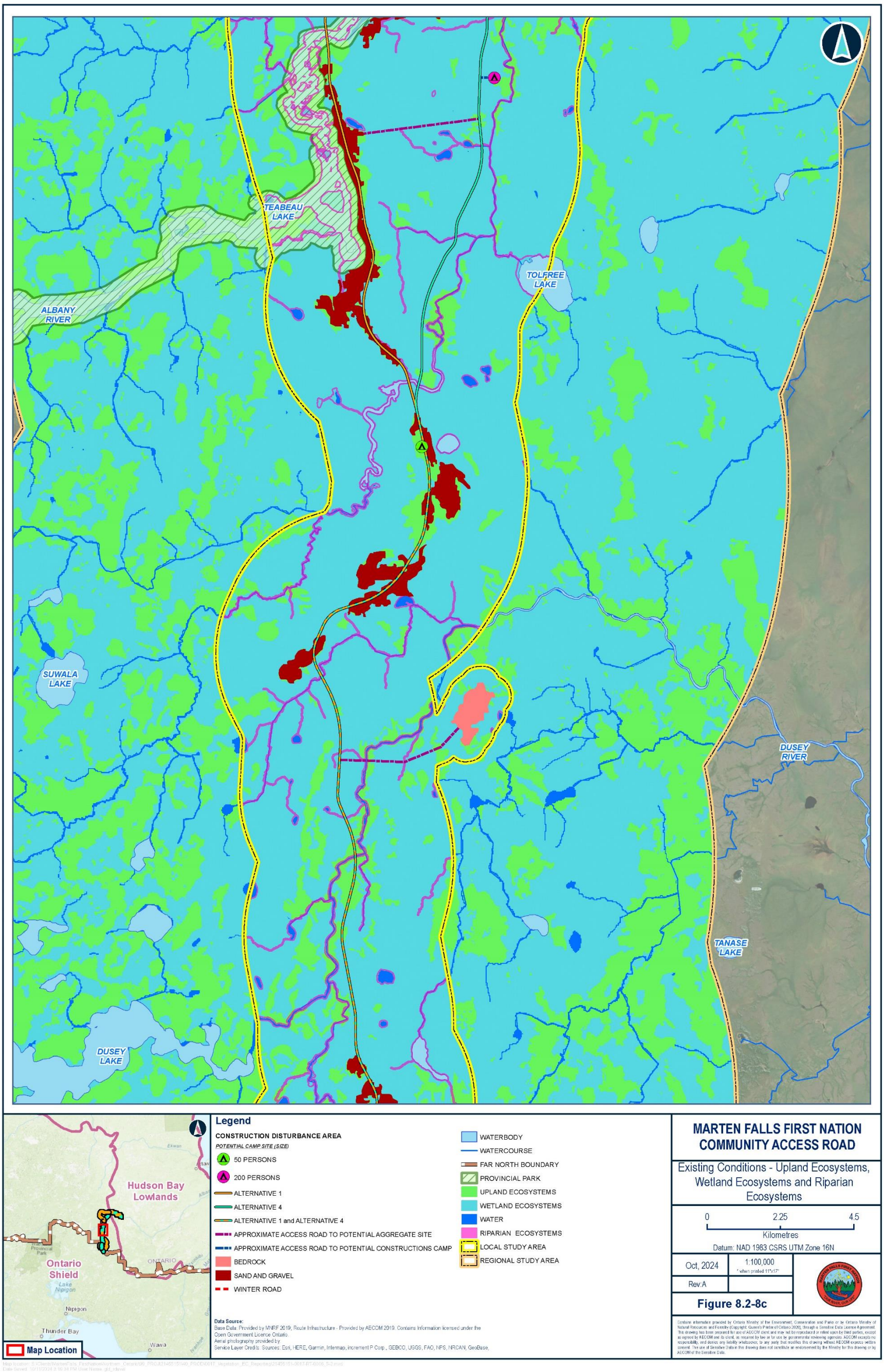


Figure 8.2-8d: Existing Conditions – Upland Ecosystems, Wetland Ecosystems and Riparian Ecosystems

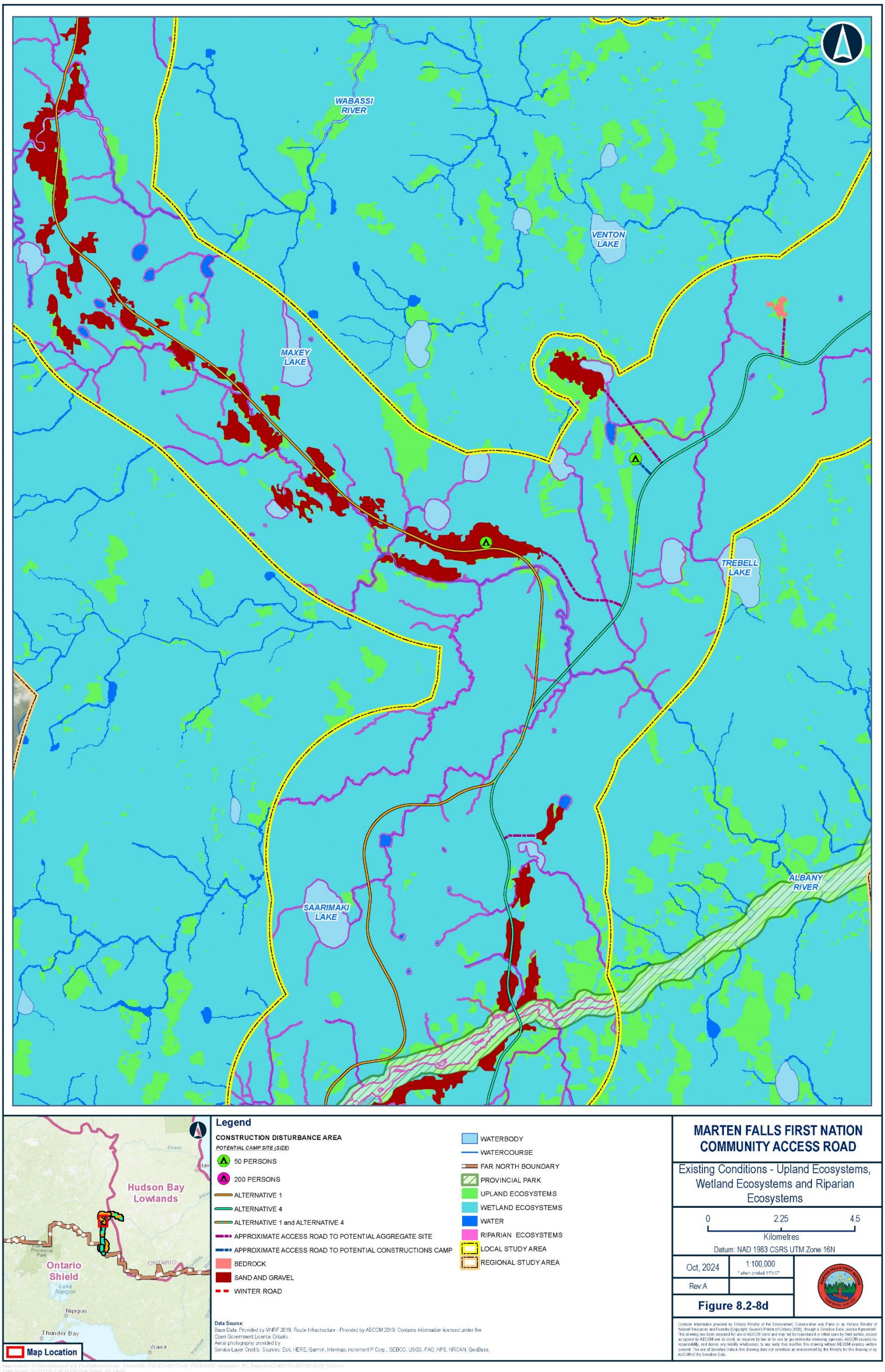


Figure 8.2-8e: Existing Conditions – Upland Ecosystems, Wetland Ecosystems and Riparian Ecosystems

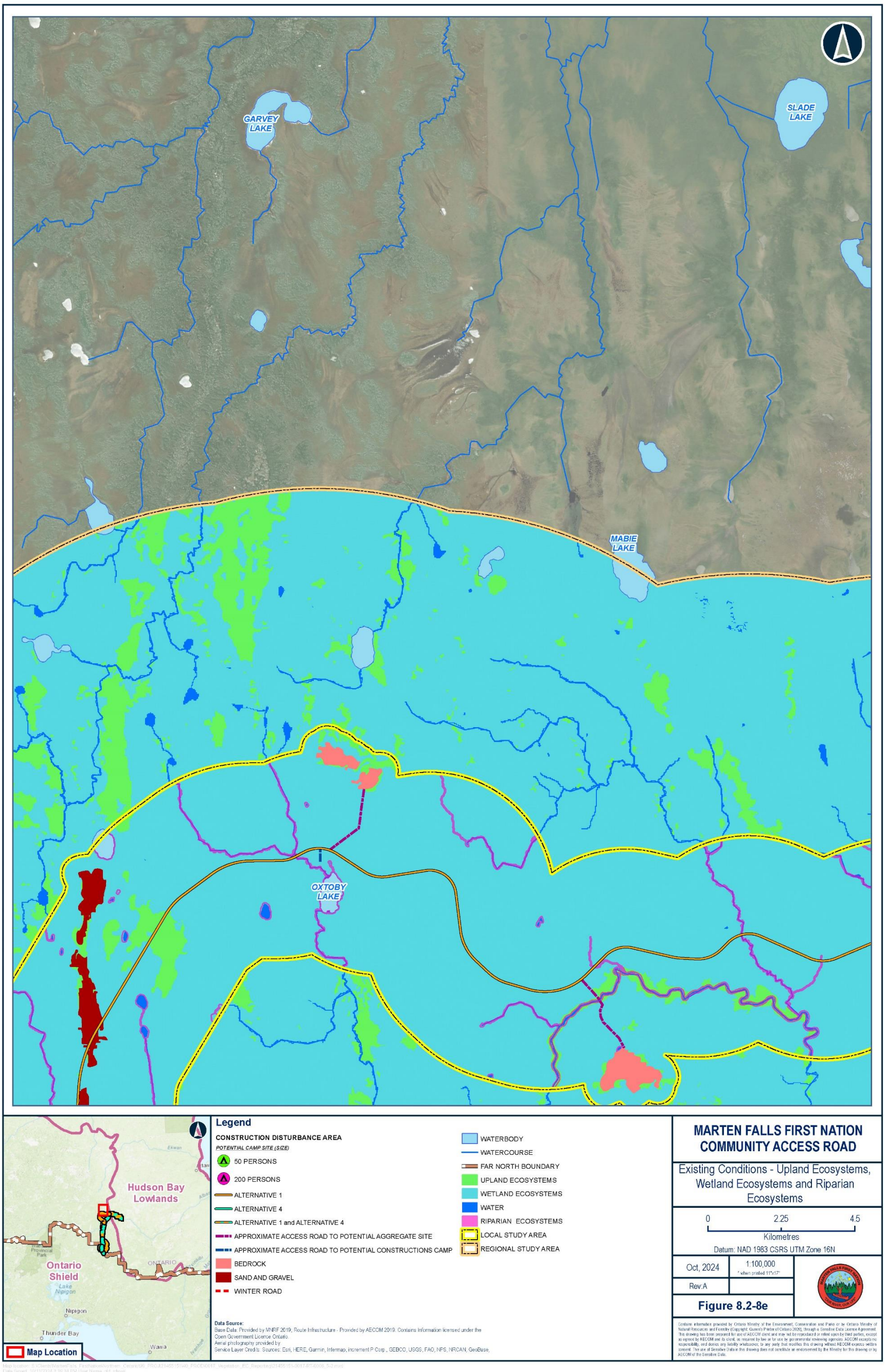


Figure 8.2-8f: Existing Conditions – Upland Ecosystems, Wetland Ecosystems and Riparian Ecosystems

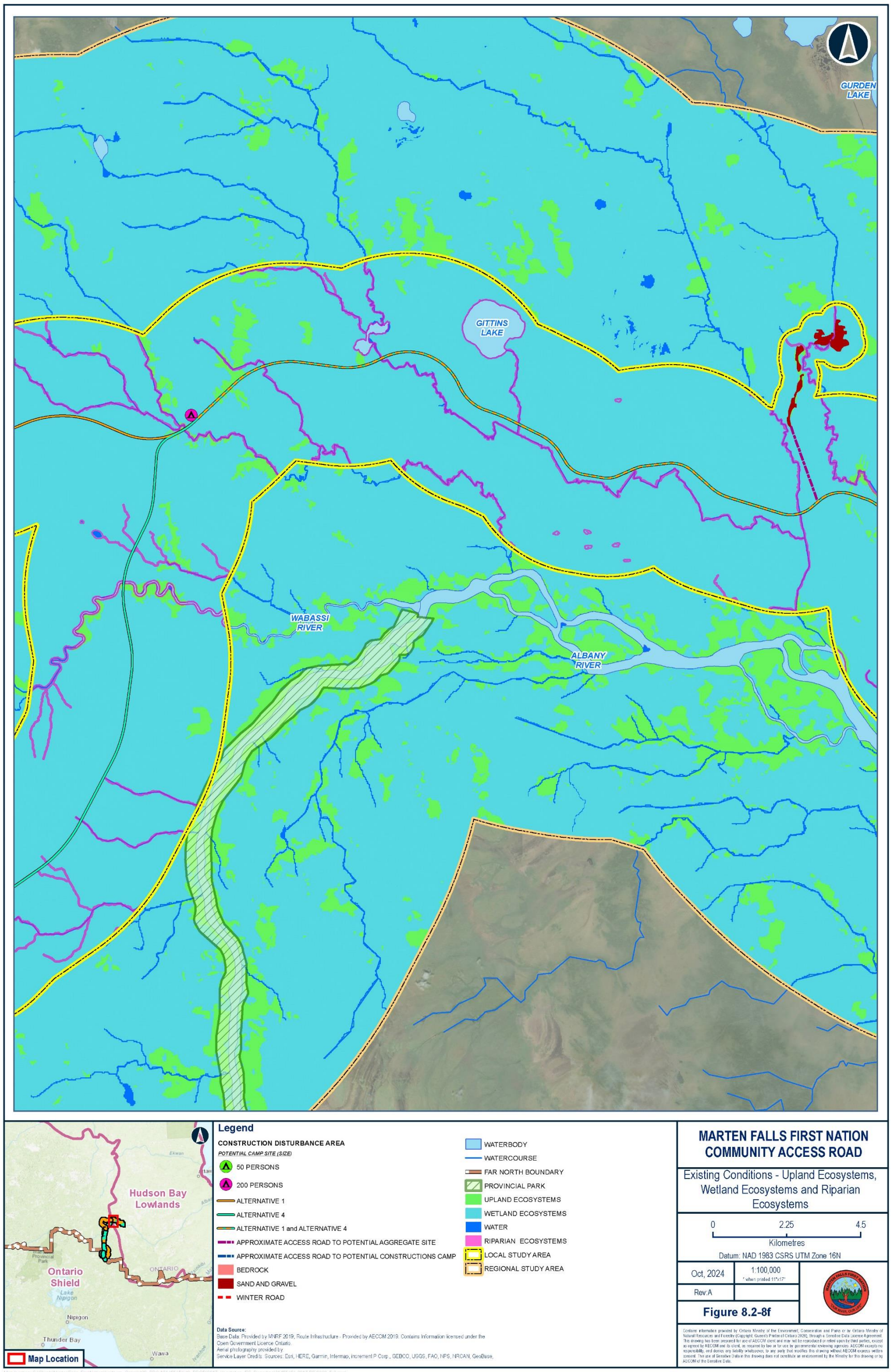
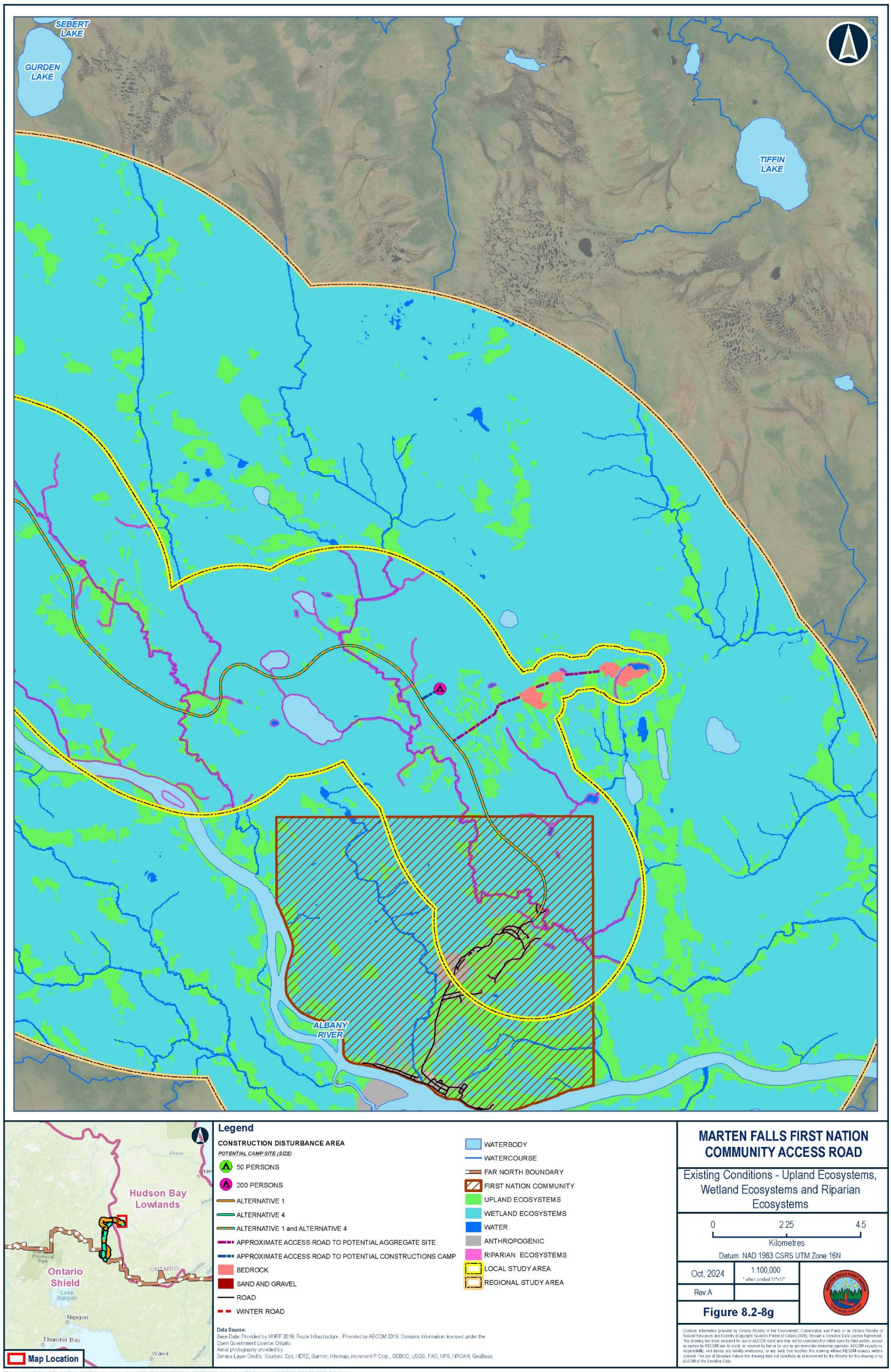


Figure 8.2-8g: Existing Conditions – Upland Ecosystems, Wetland Ecosystems and Riparian Ecosystems



8.2.4.3 Upland Ecosystems

Through the desktop mapping and field checks, a total of 31 upland ecosite types were identified within the Local Study Area. For easier mapping and analysis, ecosites have been grouped into five upland vegetation community groupings:

- Coniferous forests;
- Deciduous forests;
- Mixed forests;
- Rock / barren; and
- Early successional / sparse treed.

Upland ecosystems in the existing conditions study areas are mostly made up of coniferous forest ecosites. In the Local Study Area 86.8 percent of the upland ecosystems are coniferous forest, while in the Regional Study Area, they make up 75 percent. These vegetation groupings within the study area are summarized in **Table 8.2-5**, and shown on **Figure 8.2-9**.

Table 8.2-5: Upland Vegetation Groupings in the Existing Conditions Study Areas

Upland Community	Local Study Area (hectare)	Percent Local Study Area Uplands	Percent Local Study Area	Regional Study Area (hectare)	Percent Regional Study Area Uplands	Percent Regional Study Area
Coniferous Forest	39,213	87	20	83,886	75	14
Deciduous Forest	5,408	11	2.6	11,928	11	2.0
Mixed Forest	313	1	0.2	15,383	14	2.6
Rock / Barren	183	Less than 1	0.1	195	Less than 1	Less than 0.1
Early Successional / Sparse Treed	77	Less than 1	Less than 0.1	1,065	Less than 1	Less than 1
Total	**45,194**	**100**	**22.9**	**112,457**	**100**	**18.8**

Footnotes: Totals may vary slightly due to rounding.

Figure 8.2-9: Existing Conditions – Vegetation Community Types in the Local Study Area

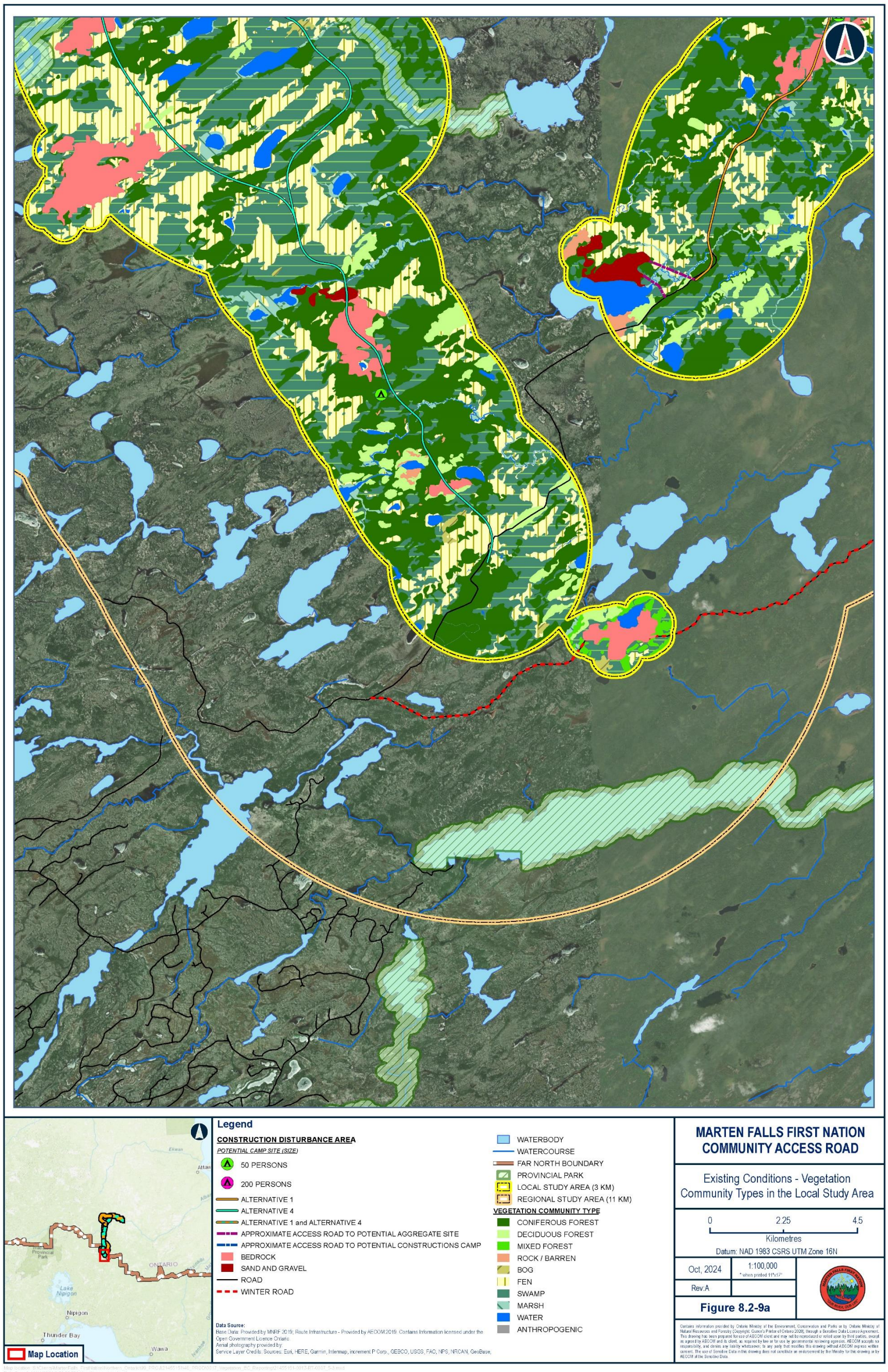


Figure 8.2-9b: Existing Conditions – Vegetation Community Types in the Local Study Area

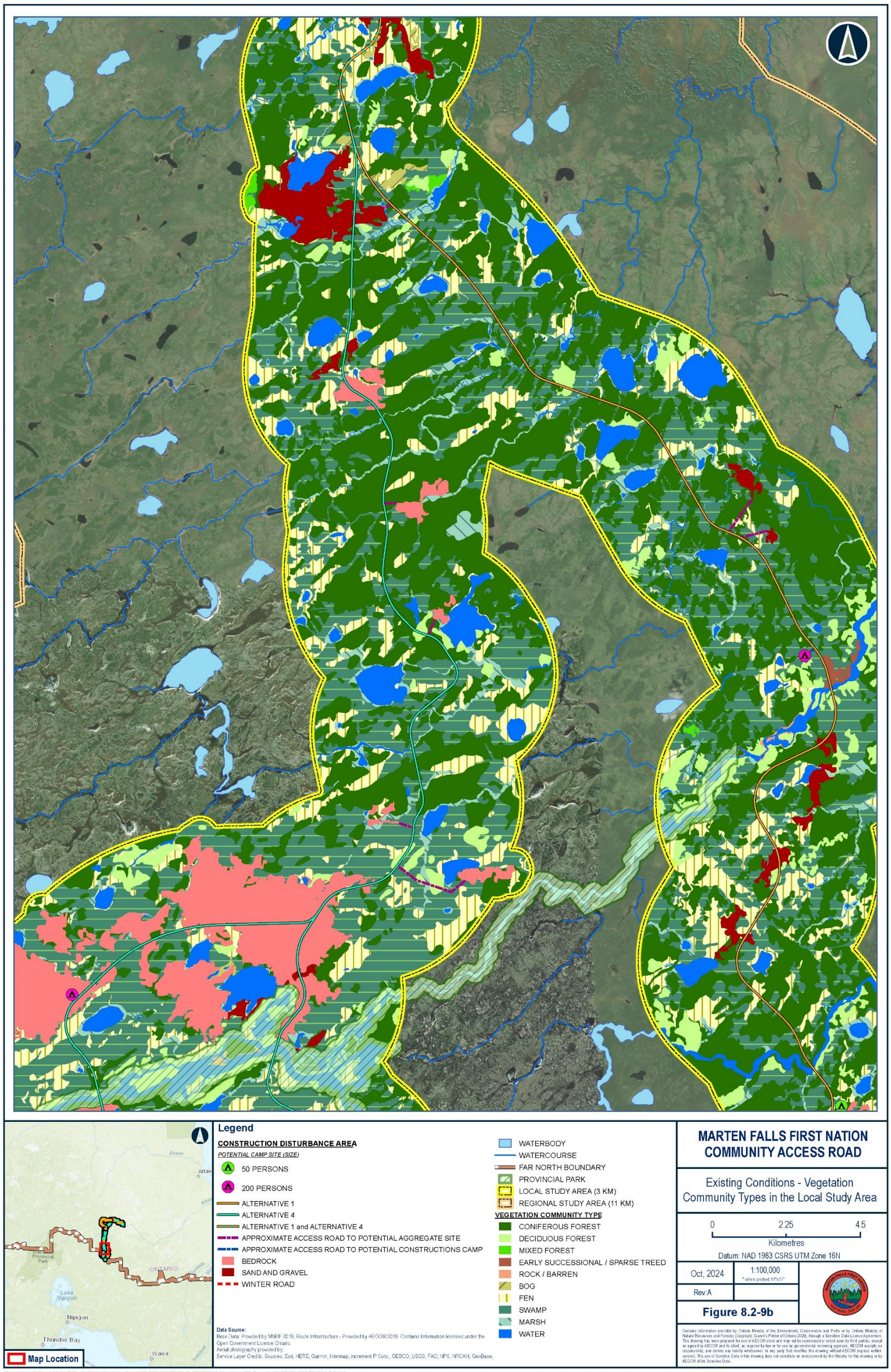


Figure 8.2-9c: Existing Conditions – Vegetation Community Types in the Local Study Area

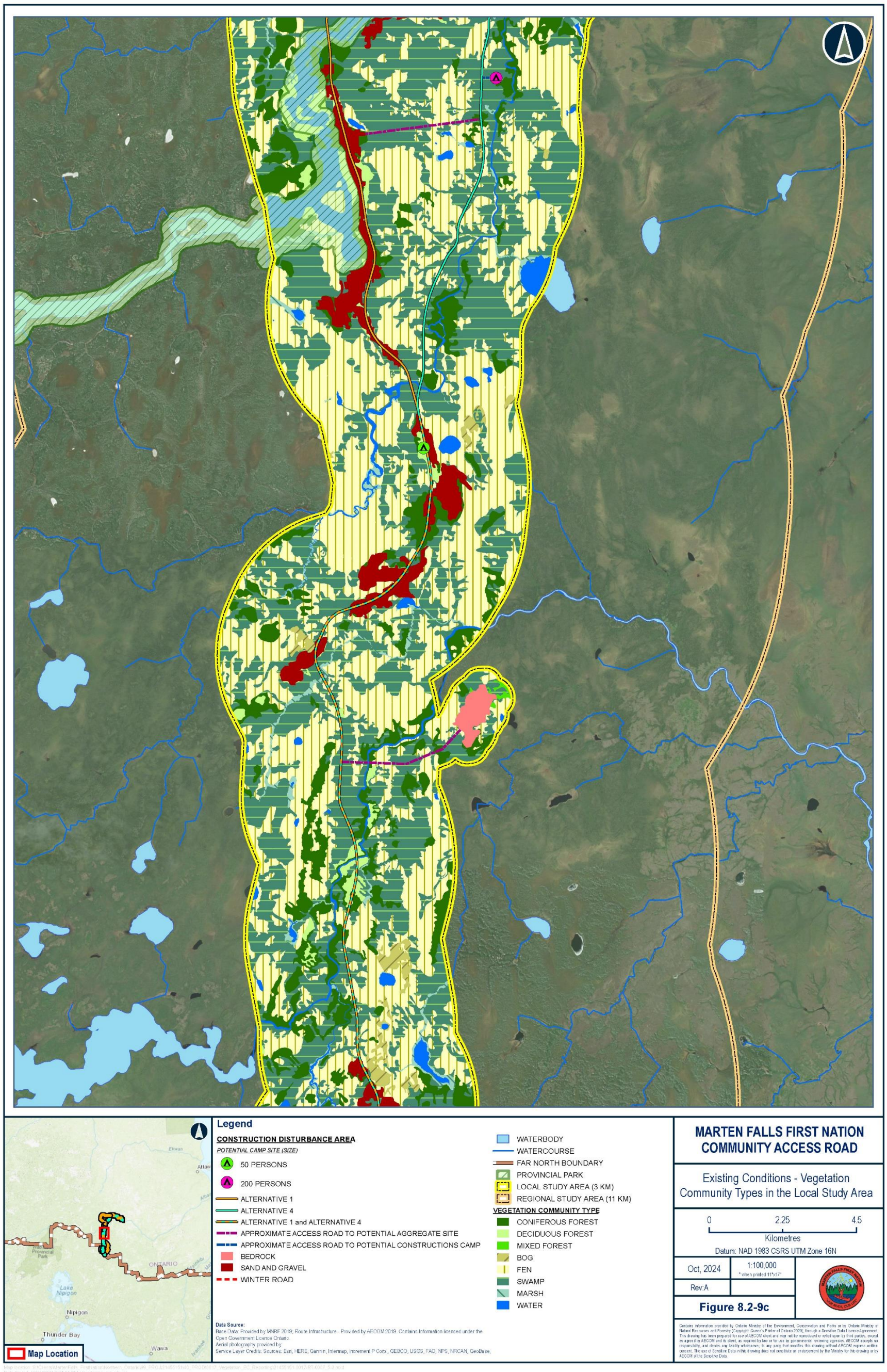


Figure 8.2-9d: Existing Conditions – Vegetation Community Types in the Local Study Area

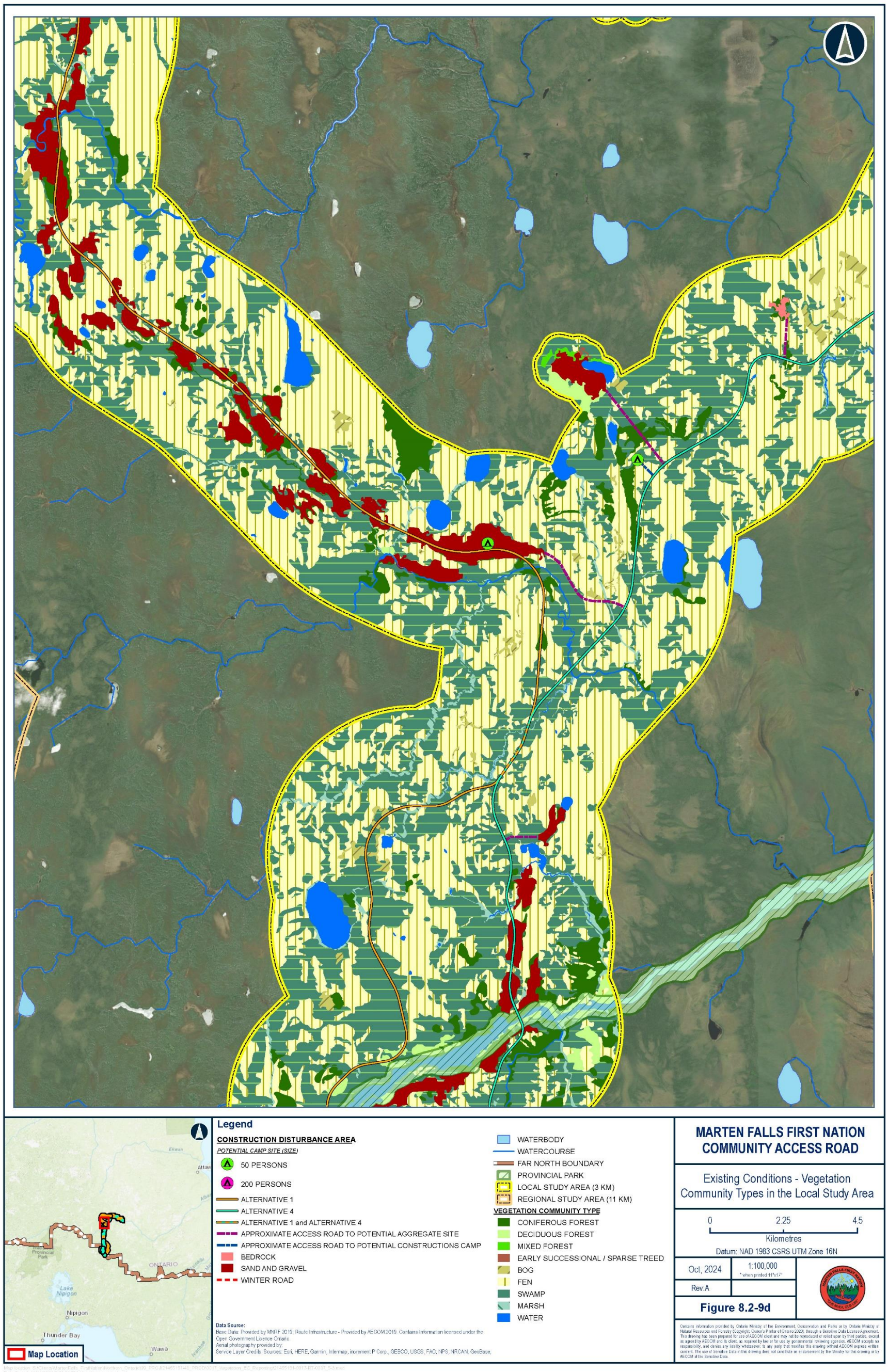


Figure 8.2-9e: Existing Conditions – Vegetation Community Types in the Local Study Area

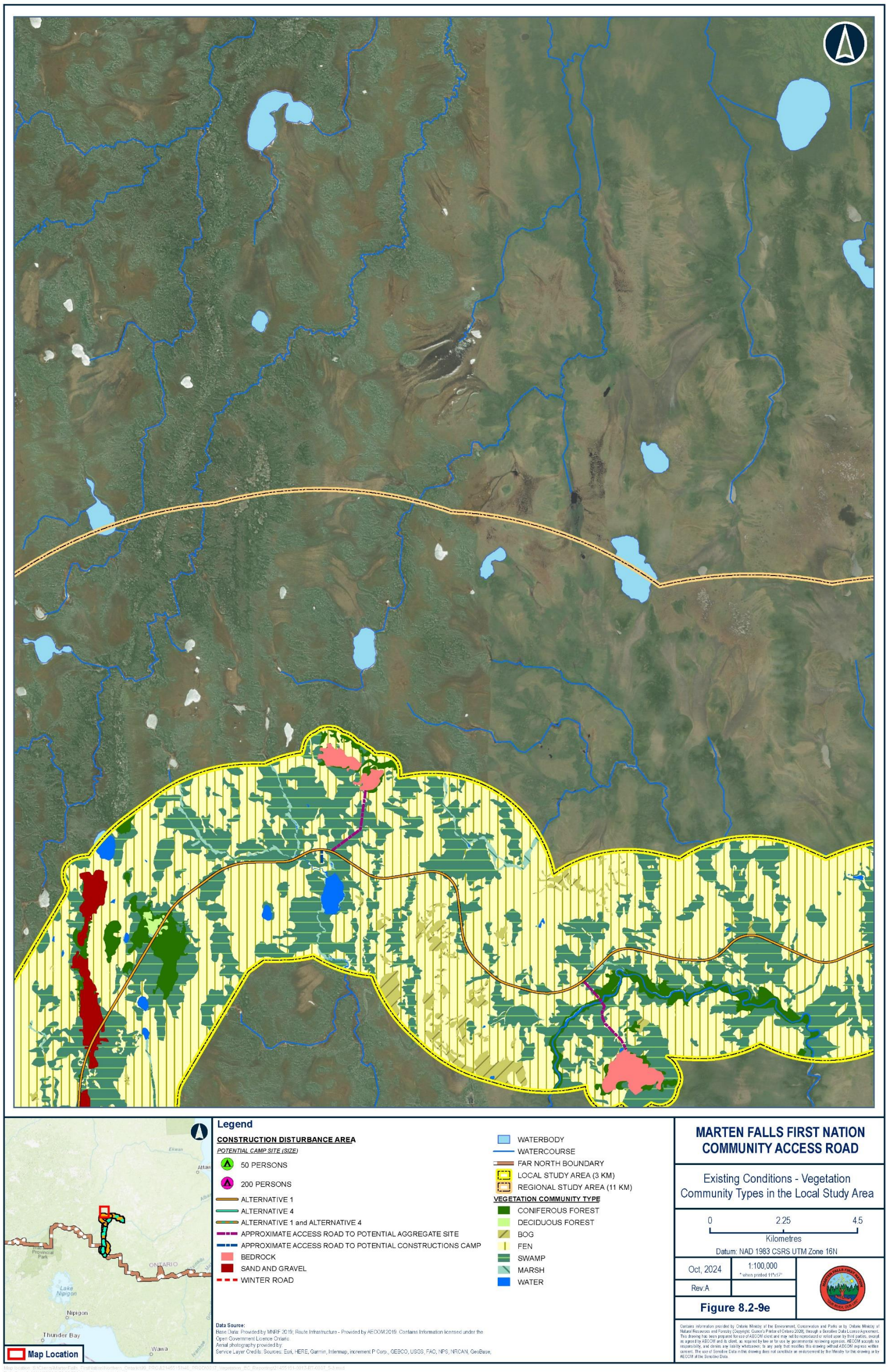


Figure 8.2-9f: Existing Conditions – Vegetation Community Types in the Local Study Area

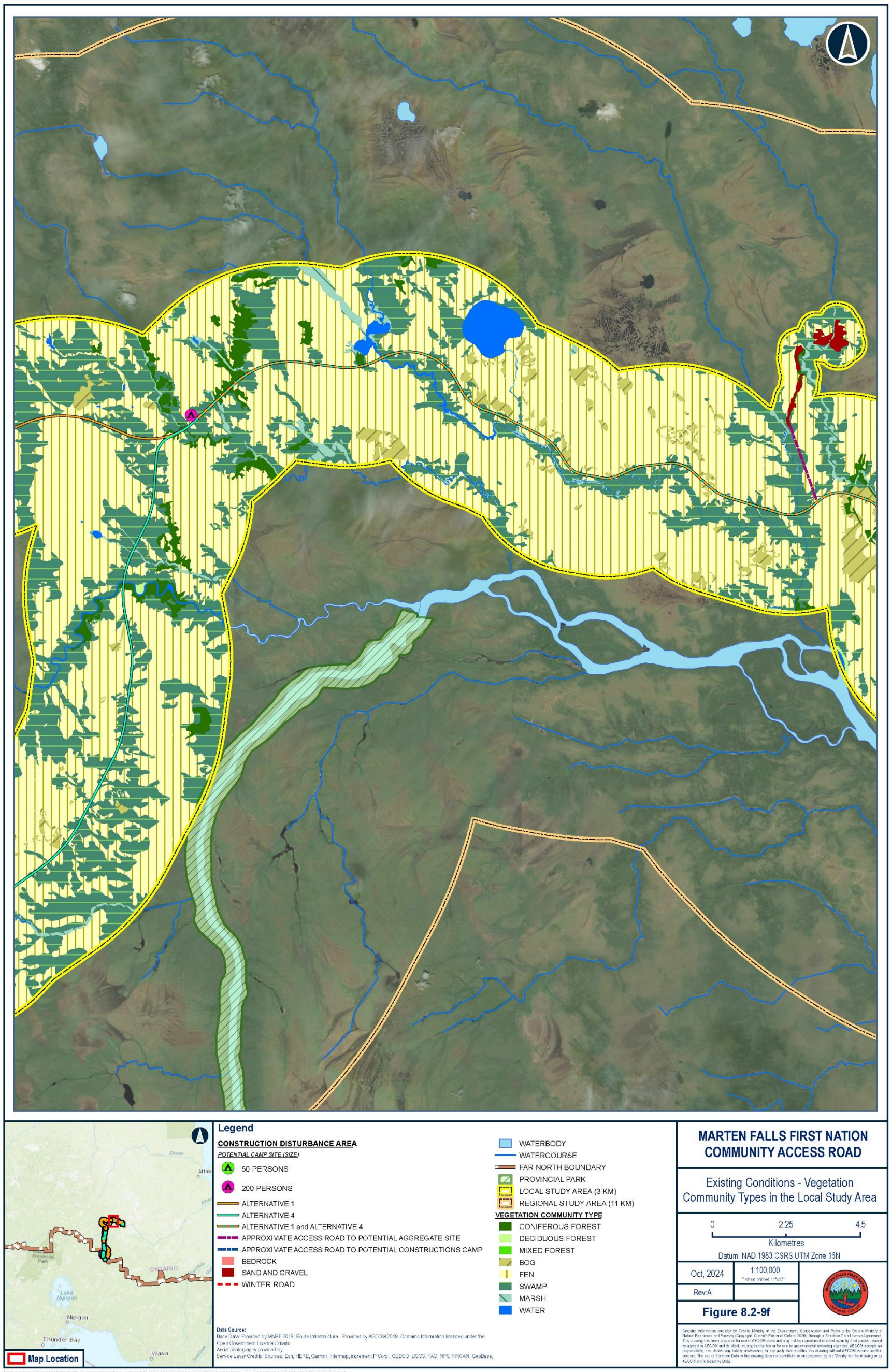
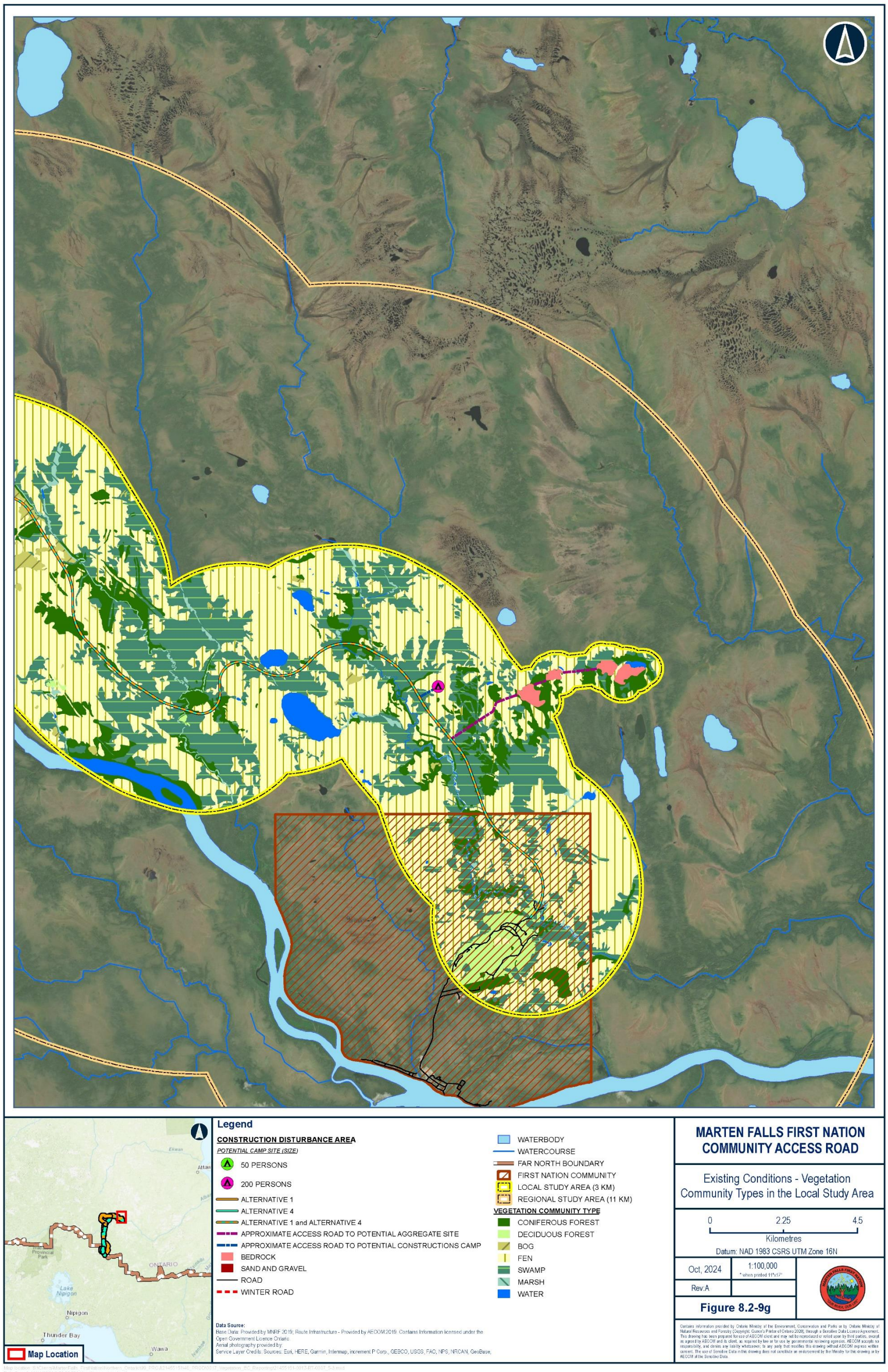


Figure 8.2-9g: Existing Conditions – Vegetation Community Types in the Local Study Area



8.2.4.4 Wetland Ecosystems

Through the desktop mapping and field checks, a total of 23 wetland ecosite types were identified within the Local Study Area. For easier mapping and analysis, ecosites have been grouped into four wetland community groupings:

- Swamp ecosites;
- Marsh ecosites;
- Fen ecosites; and
- Bog ecosites.

Fen and swamp are the most common types of wetlands within the existing conditions Local Study Area, representing 96 percent of wetland ecosystems. These vegetation groupings within the Local and Regional Study Areas are summarized in **Table 8.2-6**, and shown on **Figure 8.2-9**.

Table 8.2-6: Wetland Vegetation Groupings in the Existing Conditions Study Areas

Wetland Community	Local Study Area (hectare)	Percent Wetlands in Local Study Area	Percent Local Study Area	Regional Study Area (hectare)	Percent Wetlands in Regional Study Area	Percent Regional Study Area
Swamp	65,085	45	33	171,014	43	30
Marsh	3,928	3	2	3,929	1	1
Fen	73,917	50	37	145,917	37	25
Bog	2,278	2	1	76,460	19	13
Total	**145,208**	**100**	**73**	**397,320**	**100**	**69**

Footnotes: Totals may vary slightly due to rounding.

Wetland ecosystems in both the Local and Regional Study Areas serve various functions, which can be grouped into hydrological, biogeochemical, or habitat functions. The effectiveness of each wetland type (swamp, marsh, fen, bog) in performing these functions depends on factors like their location in the landscape, soil type (mineral or organic), and size. **Table 8.2-7** provides a summary of the wetland function and wetland performance within the existing conditions study areas.

Table 8.2-7: Summary of Wetland Functions in the Existing Conditions Study Areas

Function Category	Function	Description	Function Performance by Wetland Community Type (Swamp)	Function Performance by Wetland Community Type (Marsh)	Function Performance by Wetland Community Type (Fen)	Function Performance by Wetland Community Type (Bog)
• **Hydrological**	• Water storage	• Storage of surface water, both short-term and long-term. Capacity depends on wetland location within the landscape, size, and normal water level. May contribute to maintenance of base flows and seasonal flow distribution.	• Low to High	• Low to High	• Moderate	• Low
• **Hydrological**	• Groundwater recharge	• Dependent on location within the landscape and watershed, as well as local groundwater gradients.	• Low	• Variable	• Variable	• Variable
• **Hydrological**	• Local climate regulation	• Evapotranspiration rates provided by emergent herbaceous plants and shrubs.	• Moderate	• High	• Moderate	• Low
• **Biogeochemical / Climate**	• Water quality treatment	• Treatment of physical, chemical and biological inputs. Dependent on loading rates, hydroperiod, substrate and vegetation assemblage. Possible benefits for downstream aquatic life (for example, fish).	• High	• High	• High	• Low
• **Biogeochemical / Climate**	• Nutrient / organic export	• Export of nutrients and organic carbon to streams may influence bacteria growth, which can affect the aquatic food chain.	• Variable	• Variable	• High	• Variable
• **Biogeochemical / Climate**	• Carbon sequestration / storage	• Related to the volume of peat, as well as woody and acidic biomass.	• Moderate to High	• Moderate to High	• High	• High
• **Habitat**	• Biodiversity and biological productivity	• Support habitat for wildlife or significant species, such as Species at Risk, rare species, commercially or traditionally valued species.	• High	• Moderate to High	• Moderate to High	• Moderate
• **Habitat**	• Biodiversity and biological productivity	• Support habitat for significant vegetation species, such as Species at Risk or rare species, or traditionally valued species.	• High	• Moderate	• High	• Moderate

8.2.4.5 Riparian Ecosystems

Riparian habitats are areas that serve as a transition zone between waterbodies and land (Austin et al., 2008) and are defined as areas next to rivers, lakes, and streams (whether they flow seasonally or year-round). These areas differ from the surrounding uplands in terms of plant and animal diversity and productivity (Environment Canada, 2013a).

The riparian zone analysis, which includes a 30-metre buffer around watercourses and waterbodies, found that 8,766.8 hectares of the Local Study Area and 24,183.7 hectares of the Regional Study Area are riparian ecosystems. This makes up about 4.4 percent of the Local Study Area and 4 percent of the Regional Study Area.

Table 8.2-8 and **Table 8.2-9** provide breakdowns of the total area of riparian ecosystems in the existing conditions Local and Regional Study Areas, respectively.

Table 8.2-8: Vegetation Communities within the Riparian Zones of the Existing Conditions Local Study Area

Vegetation Community Grouping	Area (hectare)	Percent Riparian	Wetland / Upland
Coniferous Forest	1,215.3	13.9	Upland
Deciduous Forest	231.8	2.6	Upland
Early Successional / Sparse Treed	4.3	0.1	Upland
Mixed Forest	7.7	0.1	Upland
Rock / Barren	22.7	0.3	Upland
Upland Subtotal	**1,481.0**	**16.9**	**-**
Fen	1,314.7	15.0	Wetland
Bog	18.6	0.2	Wetland
Marsh	2,305.3	26.3	Wetland
Swamp	2,915.9	33.3	Wetland
Wetland Subtotal	**6,554.6**	**74.8**	**-**
Human-Altered	1.3	0.0	Upland
Water	712.8	8.1	Water
Total	**8,750**	**100**	**-**

Footnotes: Totals may vary slightly due to rounding.

Table 8.2-9: Vegetation Communities within the Riparian Zones of the Existing Conditions Regional Study Area

Vegetation Community Grouping	Area (hectare)	Percent Riparian	Wetland-Upland
Coniferous Forest	2,348.4	10	Upland
Deciduous Forest	523.3	2	Upland
Early Successional / Sparse Treed	74.8	Less than 1	Upland
Mixed Forest	757.8	3	Upland
Rock / Barren	22.7	Less than 1	Upland
Upland Subtotal	**3,727**	**15**	**-**
Fen	3,433.7	14	Wetland
Bog	399.3	2	Wetland
Marsh	2,305.7	10	Wetland
Swamp	5,427.1	22	Wetland
Wetland Subtotal	**11,565.8**	**48**	**-**
Anthropogenic	1,217.4	5	Upland
Water	7,673.2	32	Water
Other	0.3	Less than 1	Other
Total	**24,183.7**	**100**	**-**

8.2.4.6 Designated Areas

There are no Areas of Natural and Scientific Interest, Conservation Reserves, Environmentally Significant Areas, or Enhanced Management Areas currently mapped within the existing conditions study areas. Significant Woodlands are not designated on the Canadian Shield (Ontario Ministry of Natural Resources, 2000), so none are present within the existing conditions study areas.

There are two provincial parks located within the existing conditions Local Study Area: Ogoki River Provincial Park and Albany River Provincial Park. A third provincial park, Little Current River Provincial Park, is at the southernmost edge of the existing conditions Regional Study Area.

A total of 35 Critical Landform / Vegetation Associations are mapped within protected areas or proposed protected areas within the existing conditions Local and Regional Study Areas. All Critical Landform / Vegetation Associations in protected areas or proposed protected areas within the existing conditions Local and Regional Study Areas are presented in **Table 8.2-10**. Of the Critical Landform / Vegetation Associations mapped within the existing conditions Local Study Area, the most frequent include:

- Organic Deposits – Coniferous Swamp: 9,480.4 hectares or 4.8 percent;
- Organic Deposits – Treed Fen: 5,113.9 hectares or 2.6 percent;
- Organic Deposits – Treed Bog: 2,680.6 hectares or 1.4 percent;
- Organic Deposits – Open Bog: 2,296.3 hectares or 1.2 percent; and
- Fine Ground Moraine – Disturbance – Treed and / or Shrub: 1,886.4 hectares or 1.0 percent.

Table 8.2-10: Critical Landform / Vegetation Associations in Protected Areas or Proposed Protected Areas within the Existing Conditions Local Study Area and Existing Conditions Regional Study Area

Landform	Vegetation	Local Study Area (hectare)	Local Study Area (percent)	Regional Study Area (hectare)	Regional Study Area (percent)
Fine Ground Moraine	Coniferous Swamp	57	Less than 0.1	1,121	0.2
Fine Ground Moraine	Deciduous Treed	58	Less than 0.1	314	0.1
Fine Ground Moraine	Disturbance – Non and Sparse Woody	25	Less than 0.1	93	Less than 0.1
Fine Ground Moraine	Disturbance – Treed and / or Shrub	1,886	1.0	4,727	0.8
Fine Ground Moraine	Open Bog	27	Less than 0.1	522	0.1
Fine Ground Moraine	Open Fen	11	Less than 0.1	22	Less than 0.1
Fine Ground Moraine	Sparse Treed	1.4	Less than 0.1	11	Less than 0.1
Fine Ground Moraine	Thicket Swamp	6.4	Less than 0.1	6.4	Less than 0.1
Fine Ground Moraine	Treed Bog	144	0.1	1,288	0.2
Fine Ground Moraine	Treed Fen	312	0.2	1,404	0.2
Glaciofluvial Esker-Kettle Terrain	Coniferous Treed	26	Less than 0.1	0.0	0.0
Glaciofluvial Esker-Kettle Terrain	Open Bog	4.2	Less than 0.1	0.0	0.0
Glaciofluvial Esker-Kettle Terrain	Open Fen	33	Less than 0.1	0.0	0.0
Glaciofluvial Esker-Kettle Terrain	Sparse Treed	0.3	Less than 0.1	0.0	0.0
Glaciofluvial Esker-Kettle Terrain	Treed Bog	11	Less than 0.1	0.0	0.0
Organic Deposits	Coniferous Swamp	9,480	4.8	10,047	1.7
Organic Deposits	Deciduous Treed	6.1	0.0	157	Less than 0.1
Organic Deposits	Disturbance - Non and Sparse Woody	281	0.1	1,309	0.2
Organic Deposits	Disturbance - Treed and / or Shrub	17	Less than 0.1	753	0.1
Organic Deposits	Open Bog	2,296	1.2	4,061	0.7
Organic Deposits	Open Fen	303	0.2	1,184	0.2
Organic Deposits	Sparse Treed	1.1	Less than 0.1	16	Less than 0.1
Organic Deposits	Thicket Swamp	402	0.2	491	0.1
Organic Deposits	Treed Bog	2,681	1.4	3,440	0.6
Organic Deposits	Treed Fen	5,114	2.6	4,803	0.8
Precambrian Int. to Acidic Bedrock	Coniferous Treed	3.1	Less than 0.1	0.0	0.0
Precambrian Int. to Acidic Bedrock	Deciduous Treed	23	Less than 0.1	0.0	0.0
Precambrian Int. to Acidic Bedrock	Disturbance - Non and Sparse Woody	54	Less than 0.1	10	Less than 0.1
Precambrian Int. to Acidic Bedrock	Mixed Treed	9.6	Less than 0.1	0.0	0.0
Precambrian Int. to Acidic Bedrock	Open Bog	13	Less than 0.1	0.1	Less than 0.1
Precambrian Int. to Acidic Bedrock	Open Fen	0.9	Less than 0.1	0.0	0.0
Precambrian Int. to Acidic Bedrock	Sparse Treed	2.8	Less than 0.1	0.0	0.0
Precambrian Int. to Acidic Bedrock	Treed Bog	72	Less than 0.1	29	Less than 0.1
Precambrian Int. to Acidic Bedrock	Treed Fen	265	0.1	311	0.1
Total	**-**	**23,627**	**11.9**	**36,120**	**6.1**

Footnotes: Totals may vary slightly due to rounding.

8.2.4.7 Traditional Use Plants

Traditional use plants and plants of importance to Indigenous communities include plants that are historically used by Indigenous peoples for food, materials, medicinal or spiritual purposes and are still of particular interest to Indigenous communities within the region. These species are generally found throughout the region, but most plant harvesting happens near access routes such as large waterbodies, watercourses or existing roads.

A list of 43 traditional use plant species was created by reviewing desktop resources and Indigenous Knowledge provided within the Eabametoong First Nation Biodiversity Atlas (no date). This list includes plants used for medicinal or spiritual purposes, food, and / or home uses. Each species, category of use (for example, spiritual, medicinal), and information source is provided in **Table 8.2-11**.

Additional traditional use plant species were identified by Marten Falls First Nation and Aroland First Nation through communications with Marten Falls First Nation (Dillon, 2025a; Marten Falls First Nation, 2023b). The information provided by Marten Falls First Nation and Aroland First Nation included an additional 13 traditional use plant species including arrowhead, aspen, bear root, cottongrass (Eriophorum), gooseberry, lowbush Cranberry, muskrat root (sweet flag), Rock tripe lichen, rosehip, sage, tobacco, Wild celery, and wild onion.

8.2.4.8 Species at Risk and Species of Conservation Concern

The background review determined that three Species at Risk and / or Species of Conservation Concern have potential to occur within the Community Access Road existing conditions Local Study Area: Black Ash (Fraxinus nigra; Oji-Cree translation, agimagwatik), Pitcher's Thistle (Cirsium pitcher; Oji-Cree translation, gaachiichiyaag waabigwanii), and Northern Marsh Violet (Viola palustris; Oji-Cree translation, gaamiskwaadoogaag waabigwanii). One of these three species was confirmed in the study area during field surveys: Black Ash. A total of seven Black Ash tree locations were documented in two general areas, on three separate dates (September 21, 2021, June 29, 2022, and July 17, 2022). All observations are near the south limits of the existing conditions Local Study Area.

Table 8.2-11: Traditional Use Plants Used to Assess Habitat Suitability and Accessibility in the Existing Conditions Local Study Area

Common Name	Oji-Cree Name	Scientific Name	Traditional Use Category	Source
• **Alpine Bilberry / Bog Bilberry**	• Nikeminan	• Vaccinium uliginosum	• Food	• Eabametoong First Nation Biodiversity Atlas
• **American Sweetflag**	• Not applicable	• Acorus americanus	• Medicinal	• Verbal Indigenous Knowledge
• **Balsam Fir**	• Zhingobaandag (Eabametoong First Nation) • Ini'naandag (Marten Falls First Nation)	• Abies balsamea	• Home uses	• Eabametoong First Nation Biodiversity Atlas • Marten Falls First Nation communications • Marten Falls First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report (Dillon, 2025a) • Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study; Tailored Impact Statement Guidelines
• **Balsam Poplar**	• Maan azaadii	• Populus balsamifera	• Not applicable	• Tailored Impact Statement Guidelines • Marten Falls First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report (Dillon, 2025a) • Fort Albany First Nation - Letter from Fort Albany First Nation to the Impact Assessment Agency of Canada: RE: Webequie First Nation Supply Road Project and Marten Falls First Nation Community Access Road – Comments on the Draft Tailored Impact Statement Guidelines and Draft Indigenous Engagement and Partnership Plans
• **Black Crowberry**	• Not applicable	• Empetrum nigrum	• Not applicable	• Tailored Impact Statement Guidelines • Fort Albany First Nation - Letter from Fort Albany First Nation to the Impact Assessment Agency of Canada: RE: Webequie First Nation Supply Road Project and Marten Falls First Nation Community Access Road – Comments on the Draft Tailored Impact Statement Guidelines and Draft Indigenous Engagement and Partnership Plans
• **Black Spruce**	• Mina'ig (Eabametoong First Nation) • Shikobaatik (Marten Falls First Nation)	• Picea mariana	• Home uses	• Eabametoong First Nation Biodiversity Atlas • Marten Falls First Nation communications • Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study • Marten Falls First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report (Dillon, 2025a) • Aroland First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report (Dillon, 2025b)
• **Blue Flag**	• Not applicable	• Iris versicolor	• Medicinal	• Eabametoong First Nation Biodiversity Atlas
• **Bog Goldenrod**	• Not applicable	• Solidago uliginosa	• Medicinal	• Eabametoong First Nation Biodiversity Atlas
• **Broad-leaved Cattail**	• Paskakannoog	• Typha latifolia	• Home uses	• Eabametoong First Nation Biodiversity Atlas • Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report
• **Bunchberry**	• Shashagoominan (Eabametoong First Nation) • Shashakominaan (Marten Falls First Nation)	• Cornus canadensis	• Food	• Eabametoong First Nation Biodiversity Atlas • Marten Falls First Nation communications • Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study • Marten Falls First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report (Dillon, 2025a) • Nibinamik First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Impact Assessment Report (Dillon, 2025d)
• **Caribou / Reindeer Lichen**	• Wabakamik	• Cladonia rangiferina	• Not applicable	• Tailored Impact Statement Guidelines • Fort Albany First Nation - Letter from Fort Albany First Nation to the Impact Assessment Agency of Canada: RE: Webequie First Nation Supply Road Project and Marten Falls First Nation Community Access Road – Comments on the Draft Tailored Impact Statement Guidelines and Draft Indigenous Engagement and Partnership Plans
• **Cloudberry**	• Machakotominun	• Rubus chamaemorus	• Food; Medicinal	• Eabametoong First Nation Biodiversity Atlas • Weenusk First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Impact Assessment Report (Dillon, 2025c)

Common Name	Oji-Cree Name	Scientific Name	Traditional Use Category	Source
• **Common Bearberry**	• Makoominan	• Arctostaphylos uva-ursi	• Medicinal	• Eabametoong First Nation Biodiversity Atlas • Fort Albany First Nation - Letter from Fort Albany First Nation to the Impact Assessment Agency of Canada: RE: Webequie First Nation Supply Road Project and Marten Falls First Nation Community Access Road – Comments on the Draft Tailored Impact Statement Guidelines and Draft Indigenous Engagement and Partnership Plans • Nibinamik First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Impact Assessment Report (Dillon, 2025d)
• **Common Yarrow**	• Not applicable	• Achillea millefolium	• Medicinal	• Eabametoong First Nation Biodiversity Atlas
• **Creeping Snowberry**	• Kinabik (Eabametoong First Nation) • Wabiminaan (Marten Falls First Nation)	• Gaultheria hispidula	• Food; Medicinal	• Eabametoong First Nation Biodiversity Atlas • Marten Falls First Nation communications • Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study • Marten Falls First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report (Dillon, 2025a)
• **Dwarf birch**	• Not applicable	• Betula nana	• Not applicable	• Tailored Impact Statement Guidelines • Fort Albany First Nation - Letter from Fort Albany First Nation to the Impact Assessment Agency of Canada: RE: Webequie First Nation Supply Road Project and Marten Falls First Nation Community Access Road – Comments on the Draft Tailored Impact Statement Guidelines and Draft Indigenous Engagement and Partnership Plans
• **Eastern White Cedar**	• Giishkaatig	• Thuja occidentalis	• Medicinal; Spiritual	• Eabametoong First Nation Biodiversity Atlas • Verbal Indigenous Knowledge • Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study • Tailored Impact Statement Guidelines • Fort Albany First Nation Indigenous Knowledge and Use Study Specific to the Proposed Marten Falls Community Access Road (Kitching and Firelight Research Inc. with Fort Albany First Nation, 2024) • Fort Albany First Nation - Letter from Fort Albany First Nation to the Impact Assessment Agency of Canada: RE: Webequie First Nation Supply Road Project and Marten Falls First Nation Community Access Road – Comments on the Draft Tailored Impact Statement Guidelines and Draft Indigenous Engagement and Partnership Plans
• **Fireweed**	• Awihkabigwaan	• Chamaenerion angustifolium	• Medicinal	• Eabametoong First Nation Biodiversity Atlas • Aroland First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report (Dillon, 2025b)
• **Highbush Cranberry**	• Zhikwako Minik	• Viburnum opulus	• Medicinal	• Eabametoong First Nation Biodiversity Atlas • Fort Albany First Nation Indigenous Knowledge and Use Study Specific to the Proposed Marten Falls Community Access Road (Kitching and Firelight Research Inc. with Fort Albany First Nation, 2024) • Verbal Indigenous Knowledge • Marten Falls First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report (Dillon, 2025a) • Aroland First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report (Dillon, 2025b) • Weenusk First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Impact Assessment Report (Dillon, 2025c)
• **Indian-pipe**	• Not applicable	• Monotropa uniflora	• Medicinal	• Eabametoong First Nation Biodiversity Atlas
• **Jack Pine**	• Okikaandaag	• Pinus banksiana	• Food, Medicinal	• Eabametoong First Nation Biodiversity Atlas • Fort Albany First Nation Indigenous Knowledge and Use Study Specific to the Proposed Marten Falls Community Access Road (Kitching and Firelight Research Inc. with Fort Albany First Nation, 2024) • Marten Falls First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report (Dillon, 2025a)

Common Name	Oji-Cree Name	Scientific Name	Traditional Use Category	Source
• **Labrador Tea**	• Kakekaybegoon	• Rhododendron groenlandicum or Ledum groenlandicum	• Food; Medicinal • Spiritual	• Eabametoong First Nation Biodiversity Atlas • Fort Albany First Nation Indigenous Knowledge and Use Study Specific to the Proposed Marten Falls Community Access Road (Kitching and Firelight Research Inc. with Fort Albany First Nation, 2024) • Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study • Marten Falls First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report (Dillon, 2025a) • Nibinamik First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Impact Assessment Report (Dillon, 2025d)
• **Narrow-leaved Cottongrass**	• Not applicable	• Eriophorum angustifolium	• Not applicable	• Tailored Impact Statement Guidelines
• **Northern Black Currant**	• Maanatoominan	• Ribes hudsonianum	• Food	• Eabametoong First Nation Biodiversity Atlas
• **Northern Labrador Tea**	• Not applicable	• Rhododendron tomentosum	• Not applicable	• Tailored Impact Statement Guidelines • Fort Albany First Nation - Letter from Fort Albany First Nation to the Impact Assessment Agency of Canada: RE: Webequie First Nation Supply Road Project and Marten Falls First Nation Community Access Road – Comments on the Draft Tailored Impact Statement Guidelines and Draft Indigenous Engagement and Partnership Plans
• **Northern Mountain-Ash**	• Makominagaawanzh(iig) or Makominatig	• Sorbus decora	• Medicinal	• Eabametoong First Nation Biodiversity Atlas
• **Northern Wild Rice**	• Manoomin	• Zizania palustris	• Food	• Eabametoong First Nation Biodiversity Atlas • Aroland First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report (Dillon, 2025b) • Aroland First Nation Indigenous Knowledge Use Study for the Marten Falls Community Access Road (Peach, 2024) • Marten Falls First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report (Dillon, 2025a)
• **Paper Birch**	• Wiigwaasatig (Eabametoong First Nation) • Wigwaasatik (Marten Falls First Nation)	• Betula papyrifera	• Home uses; Tools, Medicinal	• Eabametoong First Nation Biodiversity Atlas • Fort Albany First Nation Indigenous Knowledge and Use Study Specific to the Proposed Marten Falls Community Access Roa (Kitching and Firelight Research Inc. with Fort Albany First Nation, 2024) • Marten Falls First Nation communications • Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study • Marten Falls First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report (Dillon, 2025a) • Aroland First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report (Dillon, 2025b) • Nibinamik First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Impact Assessment Report (Dillon, 2025d)
• **Prickly Rose**	• Not applicable	• Rosa acicularis	• Food	• Eabametoong First Nation Biodiversity Atlas
• **Red-osier Dogwood**	• Miskwabiimagaatik (Eabametoong First Nation) • Wabiminaatik (Marten Falls First Nation)	• Cornus sericea	• Medicinal	• Eabametoong First Nation Biodiversity Atlas • Fort Albany First Nation - Letter from Fort Albany First Nation to the Impact Assessment Agency of Canada: RE: Webequie First Nation Supply Road Project and Marten Falls First Nation Community Access Road – Comments on the Draft Tailored Impact Statement Guidelines and Draft Indigenous Engagement and Partnership Plans • Marten Falls First Nation communications • Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study • Marten Falls First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report (Dillon, 2025a)

Common Name	Oji-Cree Name	Scientific Name	Traditional Use Category	Source
• **Red Raspberry**	• Miskominik	• Rubus idaeus	• Food	• Eabametoong First Nation Biodiversity Atlas • Fort Albany First Nation Indigenous Knowledge and Use Study Specific to the Proposed Marten Falls Community Access Road (Kitching and Firelight Research Inc. with Fort Albany First Nation, 2024) • Marten Falls First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report (Dillon, 2025a)
• **Red Willow – traditional name (also known as Green Alder)**	• Wikobatik	• Alnus alnobetula ssp. crispa	• Medicinal	• Marten Falls First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report (Dillon, 2025a) • Fort Albany First Nation Indigenous Knowledge and Use Study Specific to the Proposed Marten Falls Community Access Road (Kitching and Firelight Research Inc. with Fort Albany First Nation, 2024) • Fort Albany First Nation - Letter from Fort Albany First Nation to the Impact Assessment Agency of Canada: RE: Webequie First Nation Supply Road Project and Marten Falls First Nation Community Access Road – Comments on the Draft Tailored Impact Statement Guidelines and Draft Indigenous Engagement and Partnership Plans
• **Saskatoonberry**	• Kosihgwakaminatik	• Amelanchier alnifolia	• Medicinal	• Verbal Indigenous Knowledge • Marten Falls First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report (Dillon, 2025a)
• **Small Cranberry**	• Mashkikominan	• Vaccinium oxycoccos	• Medicinal	• Eabametoong First Nation Biodiversity Atlas
• **Sphagnum moss**	• Maashkigo'aaki	• Sphagnum sp.	• Home uses	• Eabametoong First Nation Biodiversity Atlas • Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study • Marten Falls First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report (Dillon, 2025a) • Fort Albany First Nation - Letter from Fort Albany First Nation to the Impact Assessment Agency of Canada: RE: Webequie First Nation Supply Road Project and Marten Falls First Nation Community Access Road – Comments on the Draft Tailored Impact Statement Guidelines and Draft Indigenous Engagement and Partnership Plans
• **Strawberry**	• Ode'minan (Wild Strawberry, Eabametoong First Nation) • Miskomaang (Strawberry, Marten Falls First Nation)	• Fragaria virginiana	• Food; Medicinal	• Eabametoong First Nation Biodiversity Atlas • Fort Albany First Nation Indigenous Knowledge and Use Study Specific to the Proposed Marten Falls Community Access Road (Kitching and Firelight Research Inc. with Fort Albany First Nation, 2024) • Marten Falls First Nation communications
• **Sweetgrass**	• Not applicable	• Anthoxanthum spp.	• Medicinal • Spiritual	• Verbal Indigenous Knowledge • Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study • Marten Falls First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report (Dillon, 2025a) • Fort Albany First Nation - Letter from Fort Albany First Nation to the Impact Assessment Agency of Canada: RE: Webequie First Nation Supply Road Project and Marten Falls First Nation Community Access Road – Comments on the Draft Tailored Impact Statement Guidelines and Draft Indigenous Engagement and Partnership Plans
• **Tamarack**	• Mashkiigwaatig (Eabametoong First Nation) • Maaskigwatik / wakinagan (Marten Falls First Nation)	• Larix larincina	• Medicinal	• Eabametoong First Nation Biodiversity Atlas • Marten Falls First Nation communications • Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study • Marten Falls First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report (Dillon, 2025a) • Aroland First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report (Dillon, 2025b) • Fort Albany First Nation Indigenous Knowledge and Use Study Specific to the Proposed Marten Falls Community Access Road (Kitching and Firelight Research Inc. with Fort Albany First Nation, 2024) • Fort Albany First Nation - Letter from Fort Albany First Nation to the Impact Assessment Agency of Canada: RE: Webequie First Nation Supply Road Project and Marten Falls First Nation Community Access Road – Comments on the Draft Tailored Impact Statement Guidelines and Draft Indigenous Engagement and Partnership Plans

Common Name	Oji-Cree Name	Scientific Name	Traditional Use Category	Source
• **Trembling Aspen**	• Apijih pakoosh	• Populus tremuloides	• Not applicable	• Tailored Impact Statement Guidelines
• **Velvet-leaved Blueberry**	• Minan	• Vaccinium myrtilloides	• Food	• Eabametoong First Nation Biodiversity Atlas • Aroland First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report (Dillon, 2025b) • Weenusk First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Impact Assessment Report (Dillon, 2025c)
• **White Spruce**	• Mihnaihk	• Picea glauca	• Not applicable	• Tailored Impact Statement Guidelines • Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study • Aroland First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report (Dillon, 2025b) • Fort Albany First Nation Indigenous Knowledge and Use Study Specific to the Proposed Marten Falls Community Access Road (Kitching and Firelight Research Inc. with Fort Albany First Nation, 2024) • Fort Albany First Nation - Letter from Fort Albany First Nation to the Impact Assessment Agency of Canada: RE: Webequie First Nation Supply Road Project and Marten Falls First Nation Community Access Road – Comments on the Draft Tailored Impact Statement Guidelines and Draft Indigenous Engagement and Partnership Plans
• **Yellow Pond-lily**	• Ateebagoon (Eabametoong First Nation) • Okitebaag (Marten Falls First Nation)	• Nuphar variegata	• Medicinal	• Eabametoong First Nation Biodiversity Atlas • Marten Falls First Nation communications • Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study • Marten Falls First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report (Dillon, 2025a)
• **Willow**	• Ashiisigobiminsh(iig) (Eabametoong First Nation) • Wiisihkobihmagoon (Marten Falls First Nation)	• Salix spp.	• Medicinal	• Eabametoong First Nation Biodiversity Atlas • Verbal Indigenous Knowledge • Marten Falls First Nation communications • Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study • Marten Falls First Nation - Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report (Dillon, 2025a)

8.2.4.9 Invasive Plant Species

No invasive plant species were identified during field investigations. It should be noted that absence of invasive plant species in ground inspection sites does not imply that invasive plant species are absent from the entire existing conditions Construction Disturbance Area, existing conditions Local Study Area, or existing conditions Regional Study Area; however, existing conditions indicate negligible to low invasive plant species presence.

8.2.4.10 Human and Natural Disturbances

A total of 649.9 hectares of human (anthropogenic) disturbances, and 38,279.9 hectares of natural disturbances have occurred within the existing conditions Local Study Area. Natural disturbances include all fire and blowdown disturbances (weather events which cause areas of forest to break or uproot) mapped by the province in the past 40 years. Nearly all natural disturbances occurred in the Albany River Ecodistrict, and the Wunnummin Lake and Lower Sachigo River Ecodistricts. Natural disturbances make up 19.4 percent of the overall Local Study Area and affected both wetland and upland ecosystems nearly equally. Human (anthropogenic) disturbances include settlements (for example, camps, outposts, communities), roads (for example, all-season, winter, trails), and forestry activities in the Local Study Area. Human (anthropogenic) disturbances make up 0.3 percent of the overall Local Study Area.

8.2.5 Wildlife

Existing conditions were determined through a combination of desktop assessment and by completing field surveys. The desktop review included checking existing information, previous surveys in the area, and knowledge from Indigenous communities. Field surveys were done between 2019 and 2023, gathering information from public sources, published reports, Indigenous communities, and habitat maps related to wildlife in the study areas.

From June to September 2019, 21 remote cameras were set up, and from June 2021 to June 2023, 30 more cameras were added. These cameras recorded for a total of 22,841 days. The wildlife cameras captured images of caribou, moose, wolves, black bears, and other animals like wolverines and Canada lynx. Caribou were seen in all seasons, mostly in bogs. Moose were mostly seen in coniferous and deciduous forests. Wolves and black bears were mostly seen in coniferous forests.

The complete description of wildlife existing conditions is documented in the Wildlife Technical Support Document (**Appendix K**).

8.2.5.1 Bats – Little Brown Myotis and Northern Myotis

Little brown myotis and northern myotis are listed as endangered on Schedule 1 of the federal *Species at Risk Act* (Government of Canada, 2002) and on the Ontario *Endangered Species Act, 2007* (Ministry of the Environment, Conservation and Parks, 2007).

The number of suitable places for little brown myotis and northern myotis bats (Myotis septentrionalis; Oji-Cree translation, gaamiskwaadoogaag waabigwanii) to roost in the summer might limit understanding of the current conditions. These bats are not picky and can be found in many types of forests, including evergreen broadleaf forests (Committee on the Status of Endangered Wildlife in Canada, 2013). Little brown myotis, and to a lesser extent, northern myotis, can adapt well to human environments. They can roost in buildings, bat houses, and bridges, showing they can handle changes in their summer habitat. Bats that roost in tree cavities are less attached to specific spots than those that roost in buildings or caves (Lewis, 1995; Thorne et al., 2021; Environment and Climate Change Canada, 2018; Humphrey and Fotherby, 2019).

There are not many human-made roosting structures in the study areas. Also, there are more open wetlands, like bogs and fens, than forests for roosting. Good places for little brown myotis and northern myotis bats to roost and raise their young are rare and spread out unevenly in the Local Study Area. **Table 8.2-12** summarizes the maternity roosting habitat suitability within the study area, and this is shown on **Figure 8.2-10**.

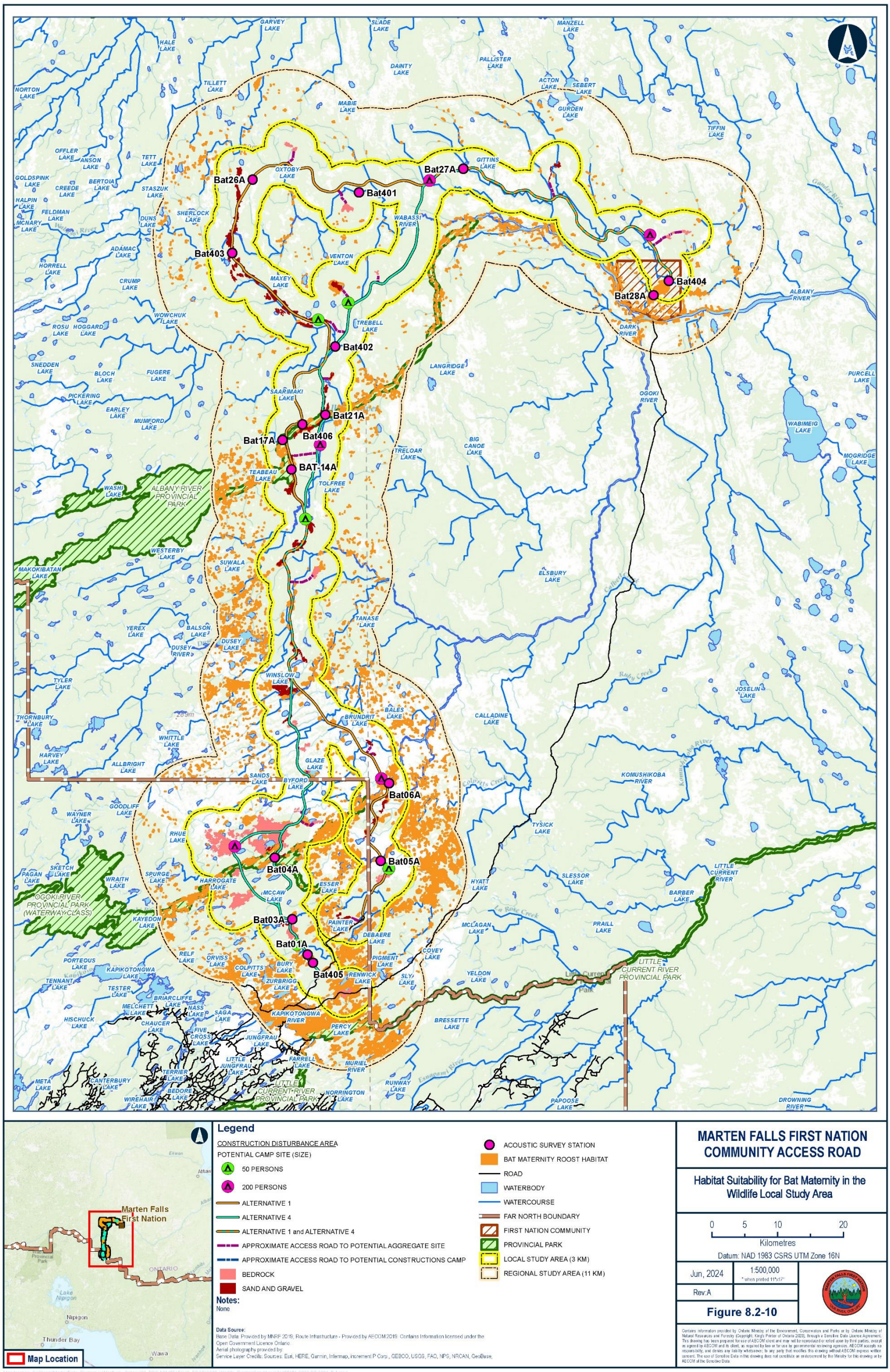
Table 8.2-12: Little Brown Myotis and Northern Myotis Maternity Roosting Habitat Suitability in the Wildlife Local and Regional Study Areas

Habitat Suitability	Local Study Area (hectare)	Local Study Area (percent)	Regional Study Area (hectare)	Regional Study Area (percent)
Suitable	14,127	5.7	31,193	4.7
Unsuitable	233,831	94.3	630,849	95.3
Total	**247,958**	**100**	**662,042**	**100**

Footnotes: Totals may vary slightly due to rounding.

Bat maternity roosts are mainly found in the south of the Local Study Area and along the Albany and Ogoki rivers. The number and location of these roosts likely affect how many bats there are and where they live.

Figure 8.2-10: Habitat Suitability for Bat Maternity in the Wildlife Local Study Area



There are plenty of good places for little brown myotis and northern myotis bats to find food throughout the Local Study Area, finding food is not a problem for them. They might use forest edges and river corridors to travel short distances between their roosts and feeding areas.

No abandoned mines suitable for bat hibernation were found during the desktop review. The lack of hibernation spots affects where these bats can live in the winter.

In 2019, little brown myotis bats were recorded at 9 out of 15 survey stations, and in 2021, they were recorded at 12 out of 17 stations. Northern myotis bats are less common and less widespread. The surveys showed low activity levels for both species, but higher activity was found near large rivers.

Little brown myotis and northern myotis bats live long lives but have low reproductive rates, making them sensitive to increases in adult deaths and slow to recover if their population decreases.

The bats that live in the Regional Study Area during the summer migrate from unknown winter habitats outside the area.

8.2.5.2 Furbearers

8.2.5.2.1 Wolverine

The wolverine is listed under the federal *Species at Risk Act* as a species of Special Concern (Government of Canada, 2002) and is listed as Threatened under Ontario's *Endangered Species Act* (Government of Ontario, 2007).

In Canada, wolverines live in various treed and treeless areas, including boreal forests, alpine tundra, and arctic tundra (Committee on the Status of Endangered Wildlife in Canada, 2014a). The Committee on the Status of Endangered Wildlife in Canada has classified the wolverine as a species of Special Concern (Committee on the Status of Endangered Wildlife in Canada, 2014a). This designation highlights the need for ongoing monitoring and conservation efforts to support the species' long-term survival. Studies show that wolverines do not have a clear preference for specific vegetation but prefer large, undisturbed wilderness areas and their habitat use changes with food availability and denning needs (Ontario Wolverine Recovery Team, 2013, Johnson et al., 2005; May et al., 2006; Krebs et al., 2007; Committee on the Status of Endangered Wildlife in Canada, 2014a). Studies also indicated that wolverine habitat selection is influenced by human activity, and are often occurring less in areas where more roads (Hohnen et al. 2025).

In the wolverine existing conditions Local Study Area (2019 to 2023), 441,902 hectares (72 percent) is undisturbed habitat, 139,392 hectares (23 percent) is disturbed habitat (natural and anthropogenic, including a 500 metre buffer), and 32,438 hectares (5 percent) is water under existing conditions. In the wolverine existing conditions Regional Study Area (2019 to 2023), the main disturbance is forestry, which occurs in 1,761,888 hectares (29 percent) of the area, and overlaps portions of four Forest Management Units. Additionally, 1,346,261 hectares (18 percent) of the wolverine existing conditions Regional Study Area has been disturbed by fire in the last 40 years (Ungulates Technical Support Document; **Appendix M**).

The response of wolverines to disturbed landscapes is variable. Some studies indicate that wolverine habitat selection is influenced by human activity, such as linear features (for example, roads, cut lines), forestry, and backcountry recreation (Krebs et al., 2007; Dawson et al., 2010; Fisher et al., 2013; Chow-Fraser et al., 2022). Wolverines have been identified as occurring less in areas with more roads and moving quicker when closer to roads (Hohnen et al. 2025). Human activity (for example backcountry camping and skiing) has been associated with a decrease in wolverine detection probability, with females showing a stronger avoidance for these areas (Hohnen et al. 2025).

Wolverine have been documented avoiding forest harvest features such as cut block interiors yet also being attracted to some features including cut block edges (Hohnen et al. 2025). Denning locations tend to occur in remote, undeveloped areas, indicating potential sensitivity to disturbance during this period (Ontario Wolverine Recovery Team, 2013). Dawson et al. (2010) recommends maintaining road densities below 0.44 kilometres per square kilometre in lowland boreal forests to limit disturbance to wolverines.

Wolverines mainly scavenge on moose and caribou carcasses but also eat beavers, snowshoe hares, red squirrels (Tamiasciurus hudsonicus; Oji-Cree translation, ajidamog), voles, and berries in the summer (Ministry of the Environment, Conservation and Parks, 2024b).

No confirmed wolverine den sites were found during field surveys, but two suspected denning areas were identified south of the Ogoki River in dense coniferous forest. These areas could not be thoroughly searched due to the presence of caribou.

In February 2022, 54 wolverine hair snag survey stations were set up in the Local Study Area with remote cameras. Wolverines were observed at 28 stations in 2022 and at 30 stations in 2023. A total of 17 unique wolverines were identified, including 4 females and 2 males. The actual number of wolverines is likely higher due to the difficulty of obtaining clear photos and hair samples.

Wolverine habitat is abundant and widespread throughout the Wolverine Local Study Area. **Figure 8.2-11** and **Figure 8.2-12** shows the wolverine habitat range density within the Local Study Area. The estimated density of wolverines was 1.21 individuals per 1,000 square kilometres in 2022 and 0.60 individuals per 1,000 square kilometres in 2023. It is estimated that approximately 43 wolverines live in the Local Study Area.

8.2.5.2.2 American Marten

American martens are closely linked to complex coniferous forests. They are often found in mature coniferous and mixed forests with lots of fallen logs and a well-developed understorey (Buskirk and Ruggiero, 1994; Clark et al., 1987; Lyon et al., 1994; Payer and Harrison, 2000; Slauson et al., 2007; Thompson and Harestad, 1994; Thompson et al., 2012).

They are not usually found in open areas with little canopy cover, like bogs, meadows, burns, and recent clearcuts (Cheveau et al., 2013; Godbout and Ouellet, 2008; Koehler and Hornocker, 1977; Taylor and Abrey, 1982). Martens are often seen as wildlife tree users because they use hollow trees for resting and raising their young (Bull et al., 2005). Buskirk and Ruggiero (1994) report that martens often make their dens in the cavities of large trees and snags, under fallen logs, or in rock crevices. They usually hunt for small mammals like rabbits, squirrels, and mice (Mus; Oji-Cree translation, wabigoshish) around fallen logs, stumps, and rocks. Research in Ontario shows that these features help martens hunt more efficiently, regardless of how many prey animals are around. This information is supported by Indigenous Knowledge from Marten Falls First Nation (Andruskiw et al., 2008).

The existing conditions study found that suitable marten habitat is widespread and abundant in both the Local Study Area and the Regional Study Area. There are about 128,657 hectares (51.9 percent) of good habitat in the Local Study Area and about 305,363 hectares (46.1 percent) in the Regional Study Area. The results are summarized in **Table 8.2-13** and shown on **Figure 8.2-13**.

Table 8.2-13: American Marten Habitat Availability Under Existing Conditions

Habitat Suitability	Local Study Area (hectare)	Local Study Area (percent)	Regional Study Area (hectare)	Regional Study Area (percent)
Moderate to High	128,657	51.9	305,363	46.1
Nil to Low	119,301	48.1	356,679	53.9
Total	**247,958**	**100**	**662,042**	**100**

Footnotes: Totals may vary slightly due to rounding.

Figure 8.2-11: Wolverine Home Range Probability Density in the Local Study Area - Heat Map (2022)

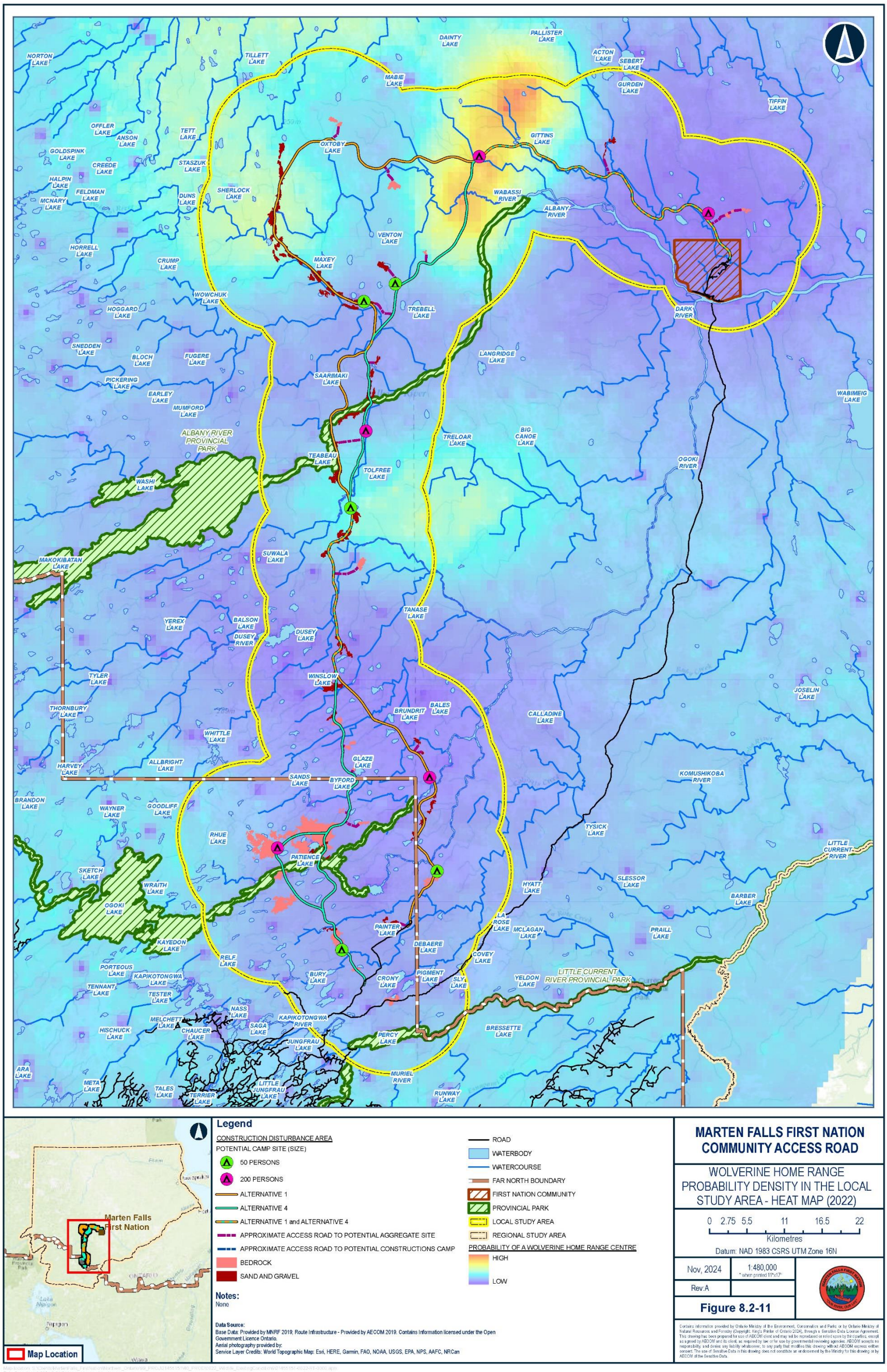


Figure 8.2-12: Wolverine Home Range Probability Density in the Local Study Area - Heat Map (2023)

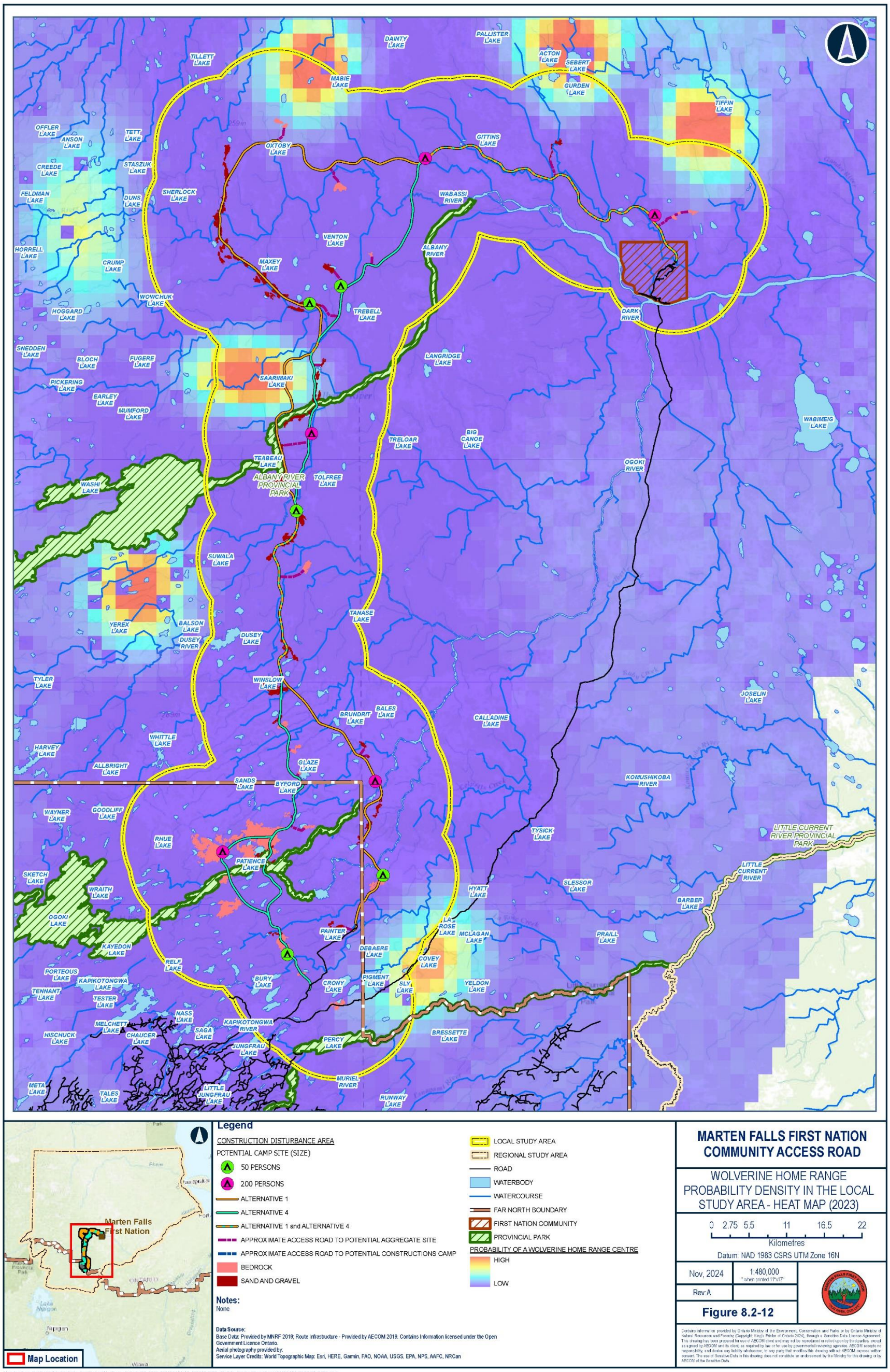
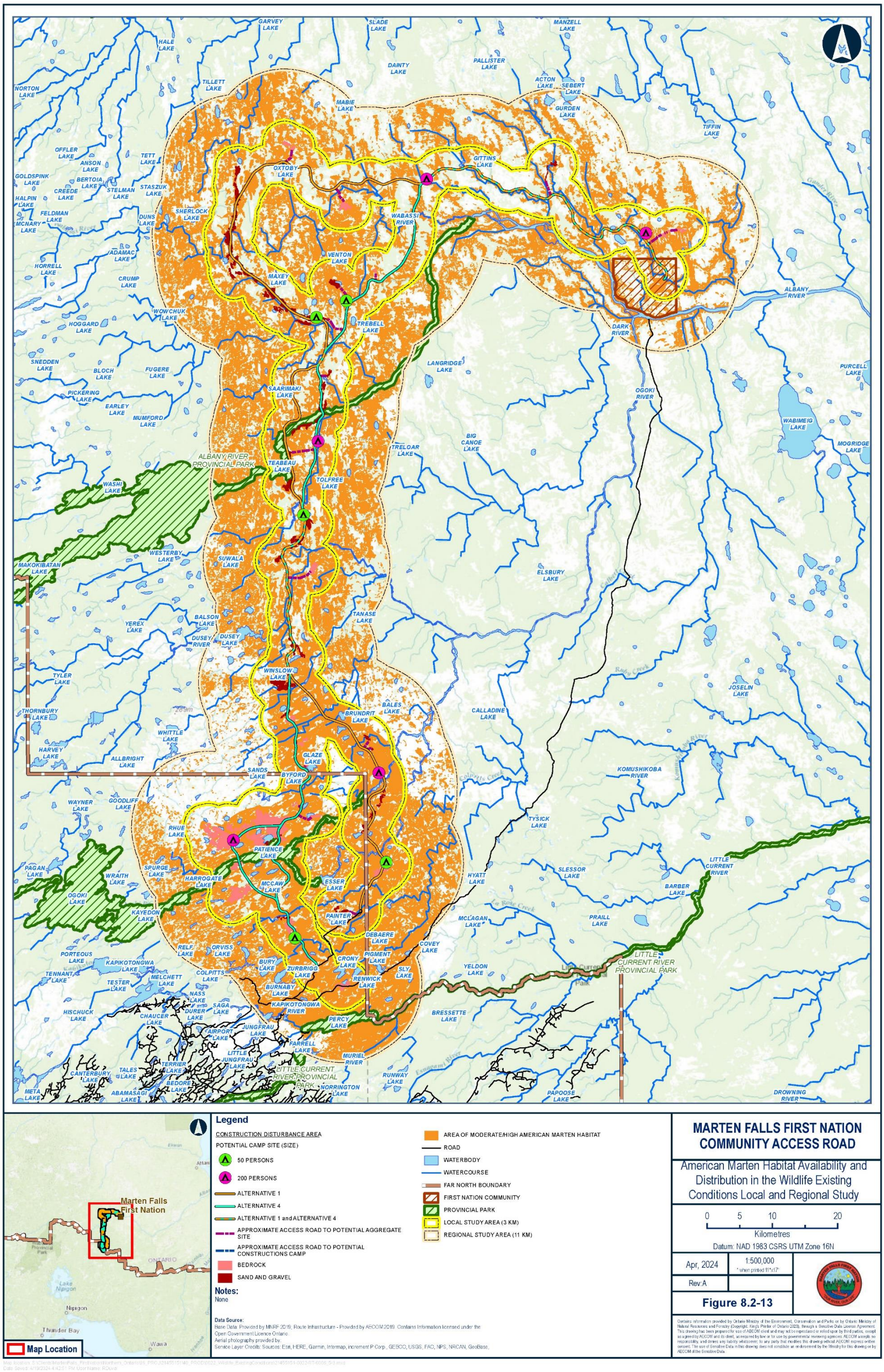


Figure 8.2-13: American Marten Habitat Availability and Distribution in the Wildlife Existing Conditions Local and Regional Study Area



Overall, evidence shows that marten habitat is abundant and widespread in both the wildlife Regional Study Area and the Local Study Area. Martens were seen at all wolverine hair snag stations and at 28 out of 51 remote camera stations. Habitat connectivity is not a problem for martens because they can travel long distances across different habitat types. The changes from natural and human disturbances are within the species' ability to adapt.

In the winter of 2023, marten habitat use was studied through aerial snow tracking surveys at 30 transects in the Construction Disturbance Area. There was no strong link between marten presence and any specific habitat type in the winter data.

Martens live relatively long lives for their size. Both males and females can reproduce by the time they are 1 year old, and established females can have many litters throughout their lives (Powell et al., 2003). Therefore, martens can grow their population quickly and can handle hunting pressure well if they have suitable habitat conditions (Fryxell et al., 1999, 2001; Powell et al., 2003). Indigenous Knowledge shared by Marten Falls First Nation noted that February is a sensitive time for marten as they tend to mate during this time.

8.2.5.2.3 Beaver

The beaver is a semi-aquatic mammal that lives in various water habitats like lakes, ponds, and slow-moving streams. It is found in forested regions across Canada (Cassola, 2016). Beavers build lodges from mud, sticks, logs, and debris near good food sources and building materials. They choose waterbodies deep enough, so the lodge entrance will not freeze in winter (Boonstra, 2021).

Although beavers are not tracked by federal or provincial authorities, they are considered culturally important by Indigenous communities who have shared their knowledge about the Community Access Road. During field studies, evidence of beavers was found in the Local Study Area, including incidental observations.

A total of 169 beaver lodges were observed during aerial surveys and other studies. More beaver activity (like lodges, dams, and signs) was found in the southern part of the Local Study Area, with fewer observations near the Community.

Most of the Local and Regional Study Areas has poor habitat for beavers because it mainly consists of conifer swamps and upland forests. While beavers might eat young coniferous trees, they prefer deciduous trees and shrubs that grow near water (Jenkins and Busher, 1979). The best habitat for beavers in the Regional Study Area includes small bodies of open water (less than 8 hectares) and areas near water with upland

deciduous forests or thicket swamps where they can find food. **Table 8.2-14** summarizes the beaver habitat suitability within the study area, and is shown on **Figure 8.2-14**.

Table 8.2-14: Beaver Habitat Availability in the Local and Regional Study Areas

Habitat Suitability (Footnote a)	Local Study Area (hectare)	Local Study Area (percent)	Regional Study Area (hectare)	Regional Study Area (percent)
High	88,054	35.5	164,441	24.8
Moderate	885	0.4	5,121	0.8
Low	8,851	3.6	90,979	13.7
Poor	140,466	56.7	365,690	55.2
Unknown	9,702	3.9	35,811	5.4
Total	**247,958**	**100**	**662,042**	**100**

Footnotes: Totals may vary slightly due to rounding.
(a) Refer to Attachment C of the Wildlife Technical Support Document (**Appendix K**) for details about habitat types in each suitability category.

Beavers have one mate for life and mate in January and February. Their babies, called kits, are usually born between April and June (Hartman, 1997; Boyle and Owens, 2007). The main threats to beaver survival, population size, and where they live are trapping and the lack of suitable habitat.

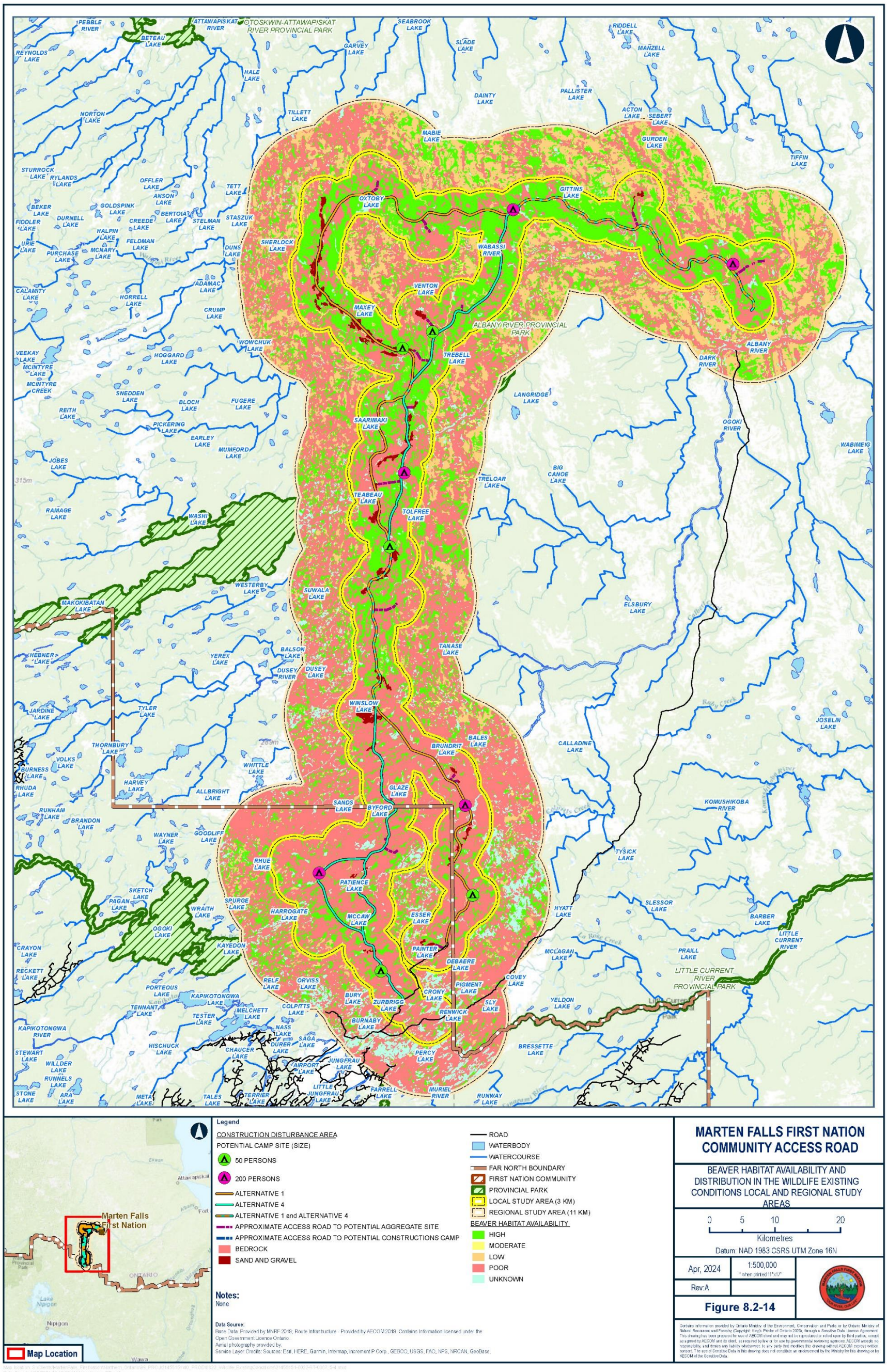
8.2.5.3 Other Mammals

For a full list of species observed at wildlife camera stations during monitoring programs, refer to the Wildlife Technical Support Document (**Appendix K**).

8.2.5.3.1 Black Bear

From June 2021 to June 2023, there were 143 black bear sightings on 19 out of 30 cameras (63 percent occurrence rate). Except for one sighting in fall 2022, there were no sightings in fall and winter because black bears hibernate during these seasons. Most sightings happened in spring and summer 2022, with photo rates of 0.53 and 0.54, respectively. Black bears were observed in all six land cover classes. The photograph rate was high in coniferous treed habitat (0.77) and deciduous treed habitat (0.64). Wetland habitats (such as, bog, fen and swamp) had the lowest photo rates at 0.03, 0.03 and 0.08, respectively.

Figure 8.2-14: Beaver Habitat Availability and Distribution in the Wildlife Existing Conditions Local and Regional Study Area



8.2.5.3.2 Gray Wolf

There was a total of 42 gray wolf (Canis lupus; Oji-Cree translation, maihgan) observations from June 2021 to June 2023. There were no wolves observed in spring 2021 or winter 2023. Gray wolf was recorded on 23 of 30 cameras (occurrence rate of 40 percent). Overall, wolves were observed at low frequencies dispersed evenly among the seasons of the 2-year study period. Gray wolves were observed in all six land cover classes. Photo rate was highest in deciduous treed habitat (0.20).

8.2.5.3.3 Canada Lynx

There were seven Canada lynx observations from June 2021 to June 2023. There was no Canada lynx observed in fall 2021, winter 2022 or winter 2023. Summer 2022 had the most Canada lynx observations over the 2-year study period. Canada lynx were observed in four land cover classes. There were no observations of Canada lynx in coniferous treed or swamp habitats. They were mostly observed in deciduous treed habitat.

8.2.5.3.4 Red Fox

There were 30 red fox observations from June 2021 to June 2023. There was no red fox observed in spring 2021, or winter, summer and fall 2022. Winter 2023 had the most red fox observations over the 2-year study period. Red foxes were observed in four land cover classes. There were no red fox observations in bog or coniferous treed habitats. Red foxes were most frequently observed in deciduous treed habitat.

8.2.5.4 Reptiles and Amphibians

There is potential for five frog species to occur in the wildlife existing conditions Local and Regional Study Areas: spring peeper (Pseudacris crucifer), boreal chorus frog (Pseudacris maculata), wood frog (Lithobates sylvaticus), northern leopard frog (Lithobates pipiens), and mink frog (Lithobates septentrionalis). Additionally, there is potential for one toad (American toad) and one species of snake (common eastern gartersnake) to occur in the wildlife existing conditions Local and Regional Study Areas. Two subspecies of common gartersnake may be present in the Regional Study Area: eastern gartersnake and red-sided gartersnake. All mentioned species of frogs and toads were recorded on autonomous recording unit acoustic surveys.

There are no existing records from western scientific sources of the blue spotted salamander in the existing conditions Regional Study Area. However, Indigenous

Knowledge provided by Marten Falls First Nation has noted that the species is known to occur in the Marten Falls First Nation Community-Based Land Use Plan planning area (Marten Falls First Nation, 2020). There is a record of spotted salamander in the vicinity of O'Sullivan Lake southwest of the study area (Ontario Nature, 2023). Although there are no records of blue spotted salamander within approximately 200 kilometres of the effects assessment Regional Study Area, there are records of this species at a similar latitude near Moosonee.

There is uncertainty regarding the northern extent of the western painted turtle and common snapping turtle ranges, these species may overlap with the effects of the Regional Study Area. There are records of painted turtles from Nakina and snapping turtles have been found between Nakina and Geraldton. Indigenous Knowledge from Aroland Nation has noted the presence of turtles along Anaconda and Painter Lake Roads, as well as potential snake and turtle habitat in the area of Melchett Lake, Tennant Lake, Kapikotongwa Lake, Briarcliffe Lake, Nass Lake and Durer Lake (Shared Value Solutions, 2024).

The only reptile species known to occur in the wildlife existing conditions Local and Regional Study Areas is eastern gartersnake. Two eastern gartersnakes were observed in the Local Study Area during the existing conditions field surveys.

Table 8.2-15 summarizes amphibian habitat suitability within the study area and is shown on **Figure 8.2-15**.

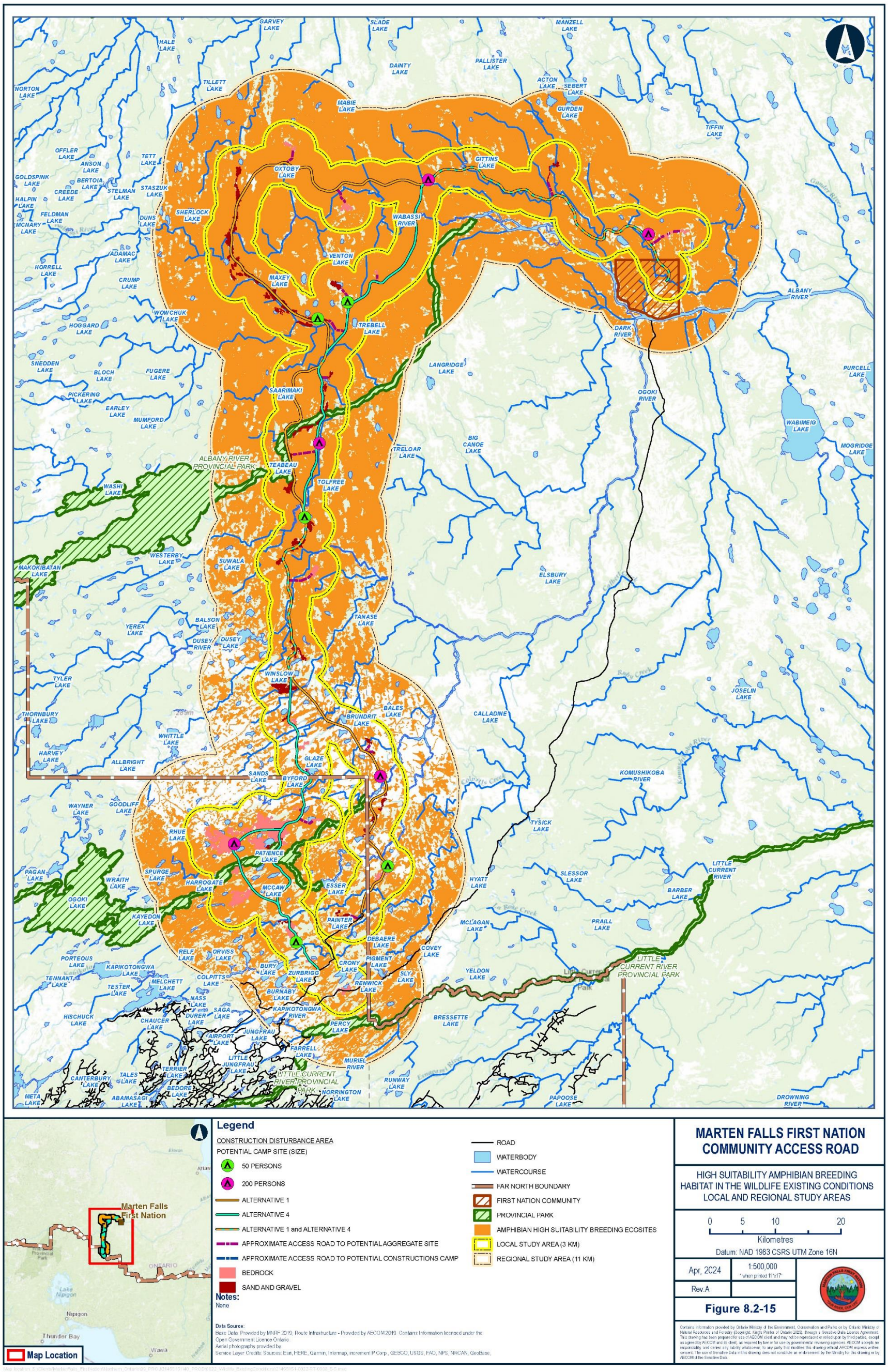
Table 8.2-15: Amphibian Breeding Habitat Availability Under Existing Conditions

Habitat Suitability	Local Study Area (hectare)	Local Study Area (percent)	Regional Study Area (hectare)	Regional Study Area (percent)
Suitable	177,670	72	469,964	71
Unsuitable	70,288	28	192,078	29
Total	**247,958**	**100**	**662,042**	**100**

Footnotes: Totals may vary slightly due to rounding.

Many amphibians and reptiles use different habitats at different stages of their lives. However, they do not move far and tend to stay in the same area. They are considered local migrants because they move between nearby habitats for winter, spring breeding, and summer each year.

Figure 8.2-15: High Suitability Amphibian Breeding Habitat in the Wildlife Existing Conditions Local and Regional Study Areas



8.2.5.5 Pollinating Insects

Three bumble bee and two lady beetle Species at Risk have potential to occur in the existing conditions Local and Regional Study Areas: Ashton cuckoo bumble bee (previously gypsy cuckoo bumble bee; Bombus bohemicus), Suckley's cuckoo bumble bee (Bombus suckleyi), yellow-banded bumble bee (Bombus bombus), nine-spotted lady beetle (Coccinella novemnotata), and transverse lady beetle (Coccinella transversoguttata). All three bumble bee species overwinter underground or in decomposing vegetation (for example, leaf layer) (Committee on the Status of Endangered Wildlife in Canada, 2014b, 2015, 2019).

Much is still unknown about where many pollinators live in the north because there hasn't been much research. However, there are plenty of plants for pollinators to feed on throughout the study area. Foraging habitat is not considered a limiting factor for pollinating insects in the existing conditions Local and Regional Study Areas.

Populations of transverse lady beetle and nine-spotted lady beetle populations in Canada are decreasing. This is mainly because of the introduction of non-native lady beetle species for pest control in agricultural areas.

8.2.6 Birds

Existing conditions for birds were characterized based on results from field studies carried out between 2018 and 2022, Indigenous Knowledge, and other available data sources such as literature.

Data was collected from various surveys (point count, call playback, aerial, and autonomous recording units) to analyze bird populations. How often birds were detected and where, the number of birds in different areas, seasons, and habitats and where and when birds were found were all looked at. Models were created to understand what factors affect bird presence, abundance, and distribution. Different data sources were used for different birds, depending on where the most detections were. Predicted bird abundance was categorized into four levels (high, moderate, low, poor) based on survey data. Suitable habitats were those in the moderate and high categories. Habitat availability was assessed for different scenarios.

The complete description of birds existing conditions and detailed methodology is documented in the Birds Technical Support Document (**Appendix L**).

8.2.6.1 Forest Birds

Forest birds, such as songbirds, woodpeckers, and grouse, breed in upland coniferous, deciduous, and mixed-wood forests. Research shows there could be 65 forest bird species in the Project study areas, and 64 of these were found during surveys from 2018 to 2022.

There is also a chance that five forest bird Species at Risk, listed federally and provincially, could be in the Project study areas (Government of Canada, 2025a; Ministry of the Environment, Conservation and Parks, 2024c):

- Canada warbler (Cardellina canadensis; Oji-Cree translation, gaamakatew bebeshisich binechiinch);
- Eastern wood-pewee (Contopus virens; Oji-Cree translation, gaagigiweshkitwech binechiinch);
- Evening grosbeak (Coccothraustes vespertinus; Oji-Cree translation, gaa'onaagoshi nigamoch binechiinch);
- Olive-sided flycatcher (Contopus cooperi; Oji-Cree translation, Gaagweshkoshiich binechiinch); and
- Wood thrush (Hylocichla mustelina).

Four of these species (Canada warbler, eastern wood-pewee, olive-sided flycatcher, and wood thrush) were detected during field surveys.

Several forest bird species are considered priority species in at least one of the two Bird Conservation Regions that overlap the Local and Regional Study Areas [Bird Conservation Region 7 in Ontario: Taiga Shield and Hudson Plains (Environment Canada, 2013b) and Bird Conservation Region 8 in Ontario: Boreal Softwood Shield (Environment Canada, 2014)]. There are 32 priority forest bird species in these regions. All of these species, except for the evening grosbeak, were found during field surveys for the Community Access Road from 2018 to 2022.

The following species were selected to best represent the forest bird valued component:

- Red-eyed vireo represents species that use deciduous forests;
- Ovenbird represents species that use mixed forests; and
- Dark-eyed junco represents species that use coniferous and disturbed forests.

Red-eyed vireos were most common in deciduous forests in both the Local and Regional Study Areas. They were found in the highest numbers in deciduous and coniferous forests in the Construction Disturbance Area, with 1.75 individuals per plot. They were most frequently detected in the southern part of the Local Study Area near the Albany River. Habitat suitability for Red-eyed vireos is summarized in **Table 8.2-16** and shown on **Figure 8.2-16**.

Table 8.2-16: Habitat Suitability for Red-Eyed Vireo

Habitat Suitability	Construction Disturbance Area (hectare)	Construction Disturbance Area (percent)	Local Study Area (hectare)	Study Area (percent)	Regional Study Area (hectare)	Regional Study Area (percent)
High	3,312.9	26.7	51,624.8	20.8	132,322.8	19.9
Moderate	2,960.0	23.8	50,919.5	20.5	132,310.6	19.9
Low	5,017.6	40.4	77,134.6	31.1	198,585.9	30.0
Poor	1,137.9	9.1	68,278.9	27.5	198,544.1	30.0

Ovenbirds are most common in areas with rough terrain, more water, and deciduous forests, and less common in mixed forests. They were observed more often south of the Albany River than in the northern parts of the study areas. The highest number of ovenbirds was found in the Regional Study Area (0.37 individuals per plot) during point counts, while the highest number was recorded in the Construction Disturbance Area (0.75 individuals per plot) using autonomous recording units. Forest habitat structure may not be suitable for ovenbirds until 20 years after a fire (Haney et al., 2008). This may also apply to forests that have been affected by insect outbreaks. Habitat suitability for ovenbirds is summarized in **Table 8.2-17** and shown on **Figure 8.2-17**.

Table 8.2-17: Habitat Suitability for Ovenbird

Habitat Suitability	Construction Disturbance Area (hectare)	Construction Disturbance Area (percent)	Local Study Area (hectare)	Local Study Area (percent)	Regional Study Area (hectare)	Regional Study Area (percent)
High	3,910.7	31.5	69,240.1	27.9	198,213.8	29.9
Moderate	3,049.0	24.5	56,215.0	22.7	134,010.9	20.3
Low	1,079.9	8.7	23,314.1	9.4	60,052.7	9.1
Poor	4,388.8	35.3	99,188.6	40.0	269,447.2	40.7

Figure 8.2-16: Habitat Suitability for Red-Eyed Vireo in the Regional Study Area at Existing Conditions

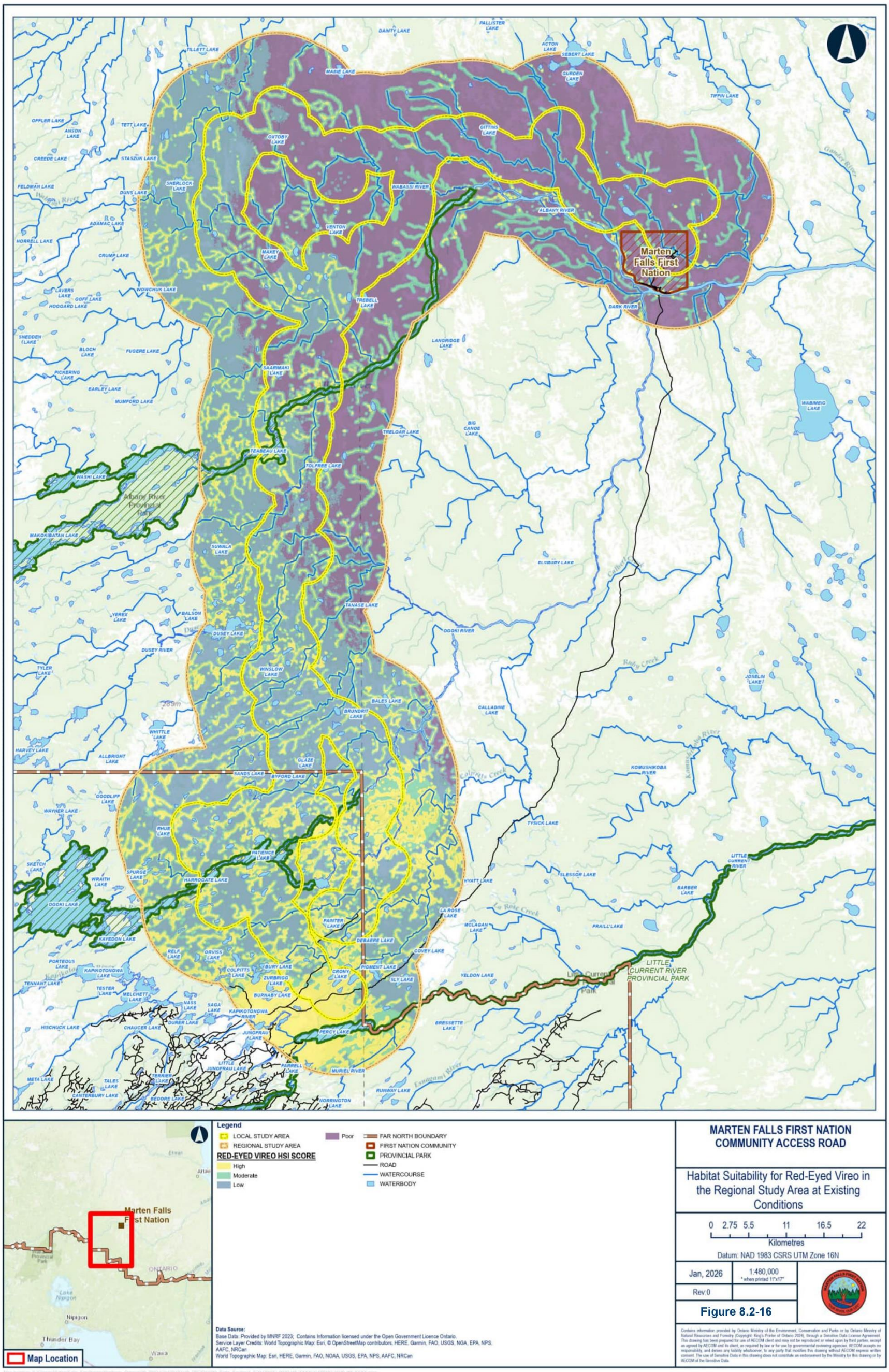
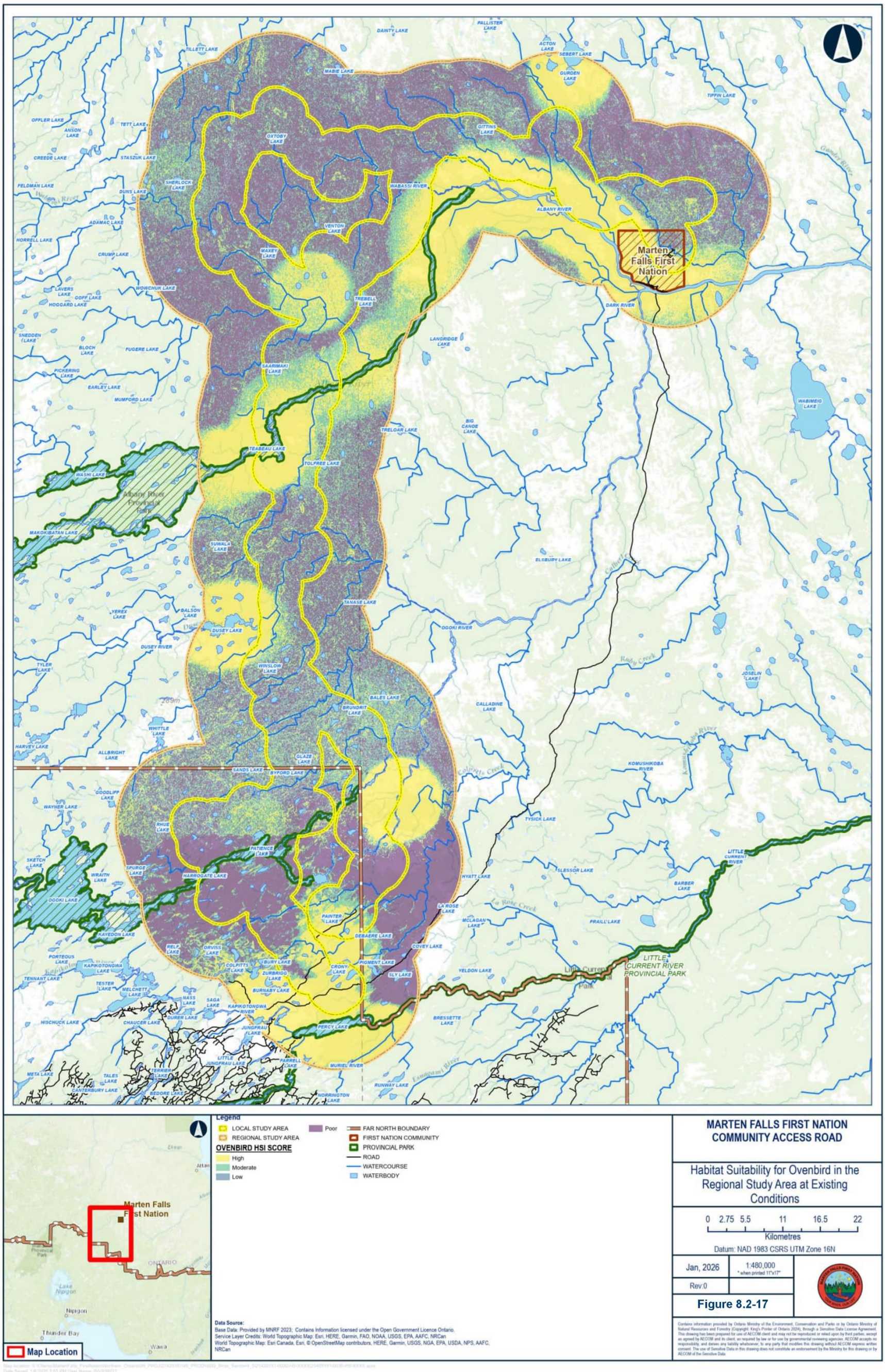


Figure 8.2-17: Habitat Suitability for Ovenbird in the Regional Study Area at Existing Conditions



Dark-eyed juncos were most commonly found in wetlands in the Local Study Area and in early successional sparse treed habitats in the Regional Study Area. They are resilient to human disturbances and changes in habitat because they nest in disturbed areas. They were evenly detected throughout the study areas from 2018 to 2022. Autonomous recording unit surveys found them most often in the fall. The highest number of Dark-Eyed Juncos was 0.70 individuals per plot in the Local Study Area during point counts, and 1.25 individuals per plot in the Construction Disturbance Area during autonomous recording unit surveys. Habitat suitability for Dark-Eyed Juncos is summarized in **Table 8.2-18** and shown on **Figure 8.2-18**.

Table 8.2-18: Habitat Suitability for Dark-eyed Junco

Habitat Suitability	Construction Disturbance Area (hectare)	Construction Disturbance Area (percent)	Local Study Area (hectare)	Local Study Area (percent)	Regional Study Area (hectare)	Regional Study Area (percent)
High to Moderate	7,076.9	56.9	75,765.9	30.6	190,174.4	28.7
Low to Poor	5,351.6	43.1	172,191.9	69.4	471,857.9	71.3

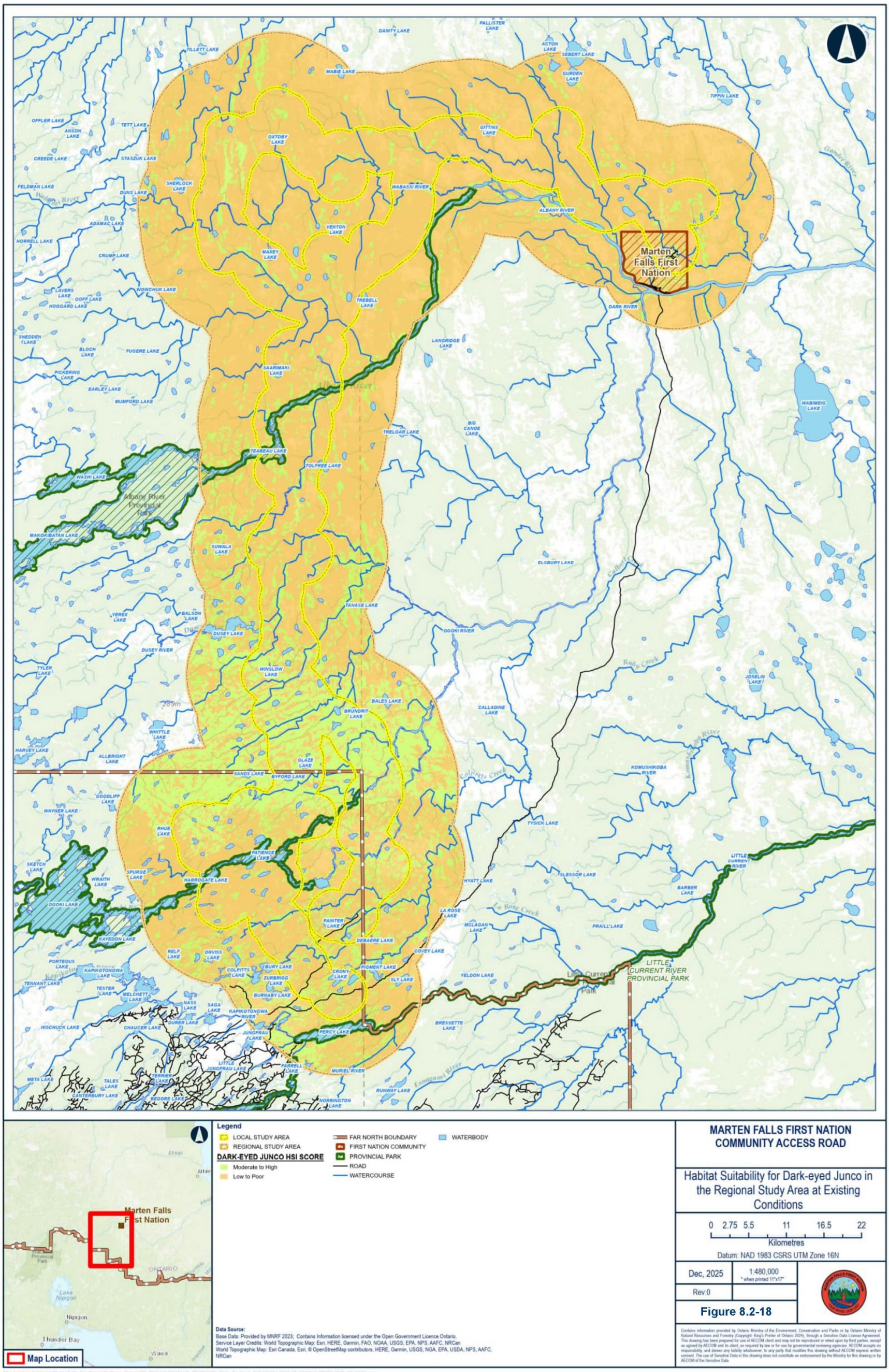
8.2.6.2 Raptors

Raptors are birds of prey that hunt with their strong talons, like hawks, eagles, falcons, and owls. Studies suggest that 17 raptor species might be in the Project study areas, and 15 of these were found during field surveys from 2018 to 2022.

Short-eared owl is the only federally listed raptor species that might be in the Project study areas. It is also listed under the Ontario *Endangered Species Act*, along with the bald eagle and golden eagle (Aquila chrysaetos). Bald eagles and golden eagles were found during field studies from 2018 to 2022, but short-eared owls were not.

Eight raptor species are considered priority species in Bird Conservation Region 7 or Bird Conservation Region 8: bald eagle, boreal owl (Aegolius funereus; Oji-Cree translation, kookookoo), golden eagle, northern goshawk (Accipiter gentilis), northern hawk owl (Surnia ulula), peregrine falcon (Falco peregrinus; Oji-Cree translation, gaagishiiyaashich migiziiw binechiinch), sharp-shinned hawk (Accipiter striatus), and short-eared owl (Environment Canada, 2013b, 2014). Six of these species (bald eagle, boreal owl, golden eagle, northern goshawk, northern hawk owl, and sharp-shinned hawk) were found during field surveys from 2018 to 2022.

Figure 8.2-18: Habitat Suitability for Dark-eyed Junco in the Regional Study Area at Existing Conditions



The following species were selected to represent the raptor valued component:

- Osprey: represents diurnal raptors; and
- Boreal owl: represents nocturnal raptors.

Osprey prefer habitats with enough food within 20 kilometres of their nest, places to build high nests (like trees, bluffs, or artificial platforms), and waterbodies that stay ice-free long enough for their young to grow. They are more likely to live in upland areas (coniferous and deciduous forests, rocky areas, and young, sparsely-treed areas) than in wetlands because uplands have large trees for nests. About 25.8 percent of the Local Study Area is upland ecosystem. Ospreys were found occasionally by recording units and point surveys. In 2022, three ospreys were detected on two recording units, and one active nest with three hatchlings was found about 5 kilometres northwest of Dusey Lake during aerial surveys. Habitat suitability for ospreys is summarized in **Table 8.2-19** and shown on **Figure 8.2-19**.

Table 8.2-19: Habitat Suitability for Osprey

Habitat Suitability	Construction Disturbance Area (hectare)	Construction Disturbance Area (percent)	Local Study Area (hectare)	Local Study Area (percent)	Regional Study Area (hectare)	Regional Study Area (percent)
High to Moderate	7,612.2	61.3	79,351.5	32.1	110,142.7	16.6
Low to Poor	4,816.4	38.8	168,606.4	67.9	551,889.7	83.4

Boreal owls live in coniferous, deciduous, and mixed forests, preferring mature and old forests. Suitable habitat for boreal owls covers 50 to 70 percent of each study area. The southern, central, and northwestern parts of the Regional Study Area, including northwest of Marten Falls, have moderate to high suitability habitat for them. Boreal owls were detected by recording units in the Construction Disturbance Area and Local Study Area, mostly during the spring when they call. There were more boreal owls in the Construction Disturbance Area (1.5 individuals per plot) than in the Local Study Area (0.3 individuals per plot). Suitable habitat for boreal owls is abundant, covering about 50 to 70 percent of each study area. Habitat suitability for boreal owl is summarized in **Table 8.2-20** and shown on **Figure 8.2-20**.

Table 8.2-20: Habitat Suitability for Boreal Owl

Habitat Suitability	Construction Disturbance Area (hectare)	Construction Disturbance Area (percent)	Local Study Area (hectare)	Local Study Area (percent)	Regional Study Area (hectare)	Regional Study Area (percent)
High	6,358.6	51.2	71,502.1	28.8	165,427.0	25.0
Moderate	2,974.5	23.9	66,839.4	26.9	165,434.7	25.0
Low	1,864.7	15.0	60,340.7	24.3	165,474.4	25.0
Poor	1,230.8	9.9	49,275.6	19.9	165,450.3	25.0

Figure 8.2-19: Habitat Suitability for Osprey in the Regional Study Area at Existing Conditions

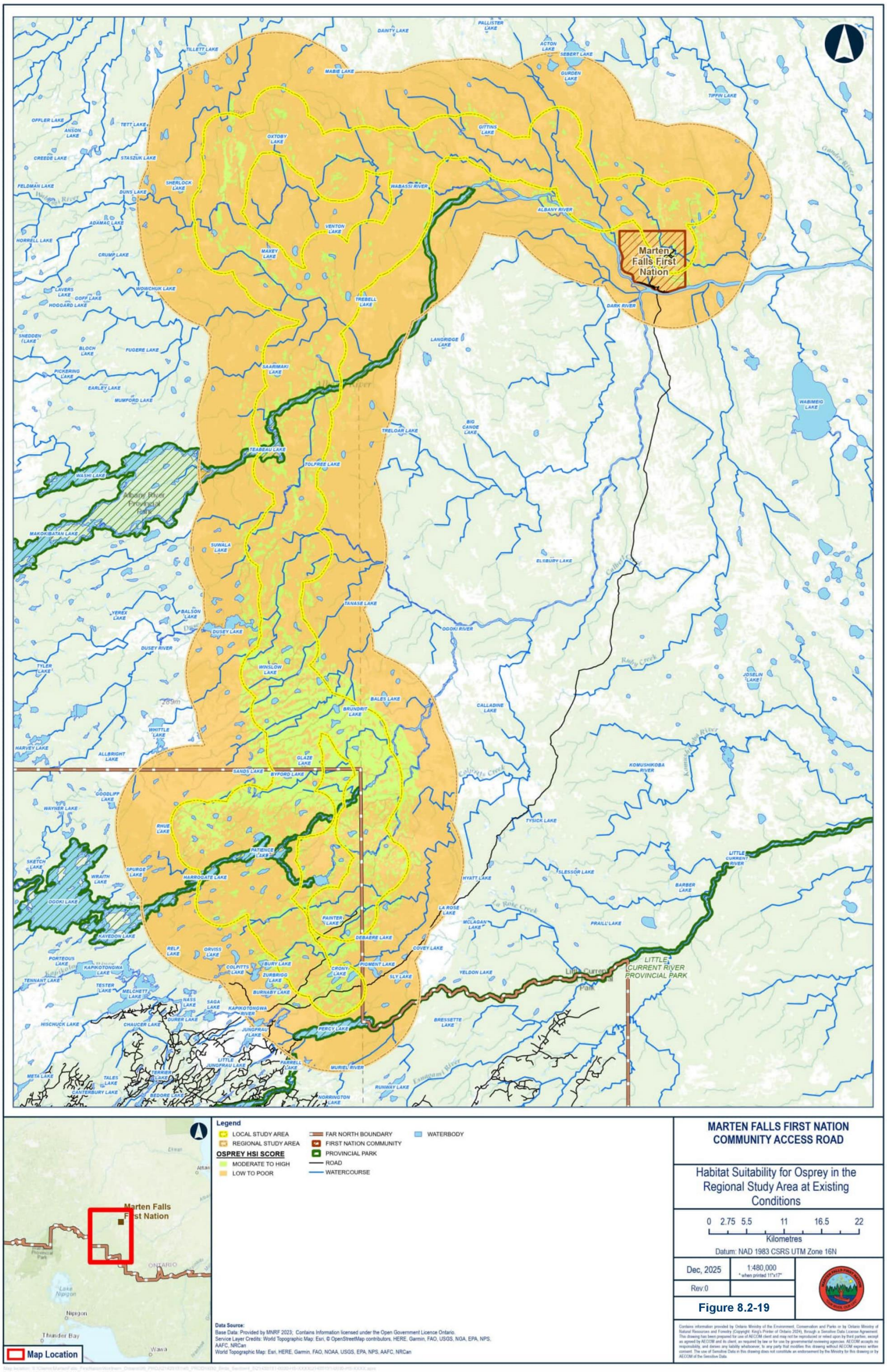
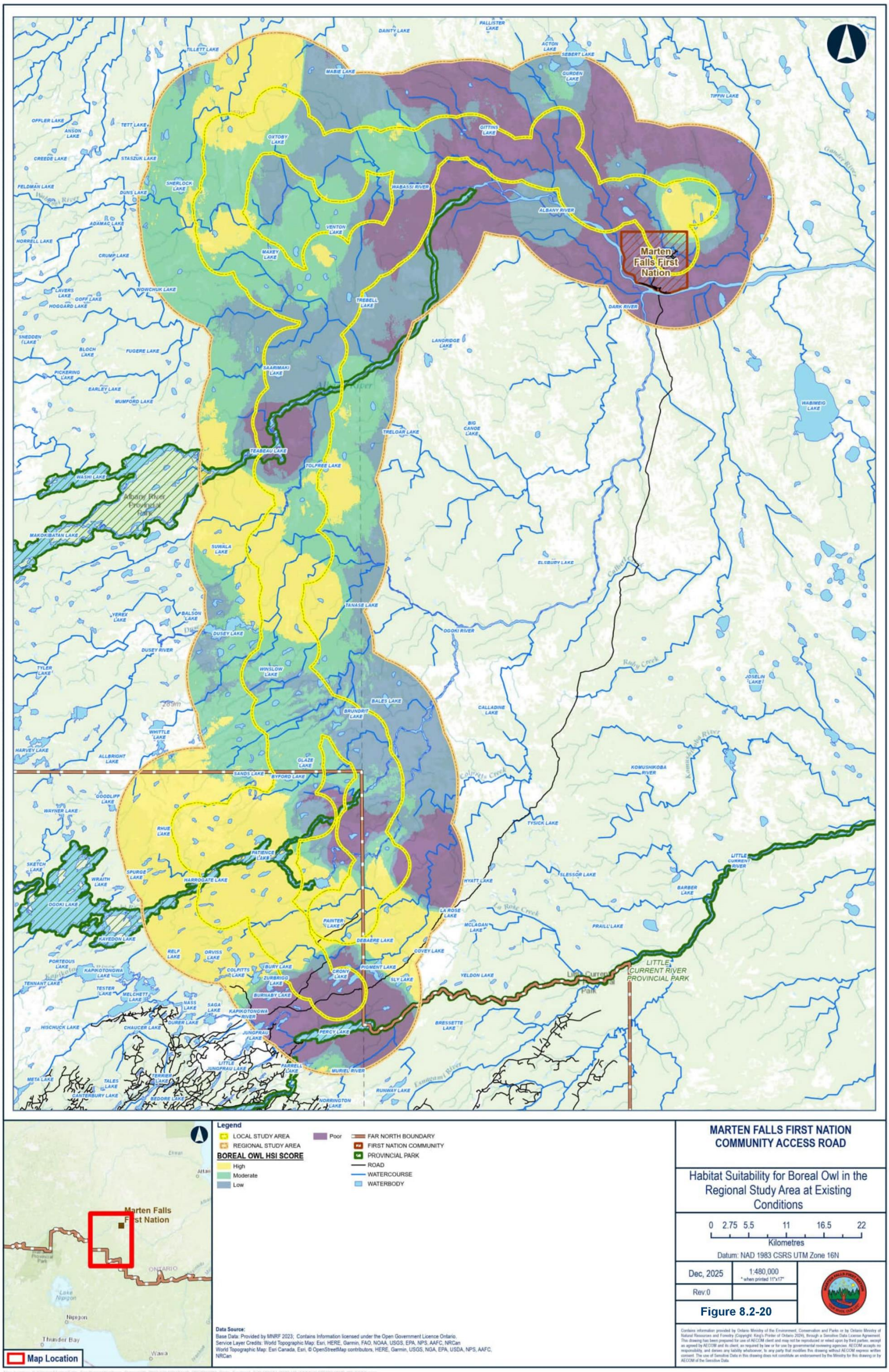


Figure 8.2-20: Habitat Suitability for Boreal Owl in the Regional Study Area at Existing Conditions



8.2.6.3 Shorebirds

Shorebirds, like plovers and sandpipers, feed and nest on the shores of waterbodies, watercourses, and wetlands. There could be 22 shorebird species in the Project study areas, but 16 of these might only stop there during migration. Eleven shorebird species were found during surveys from 2018 to 2022.

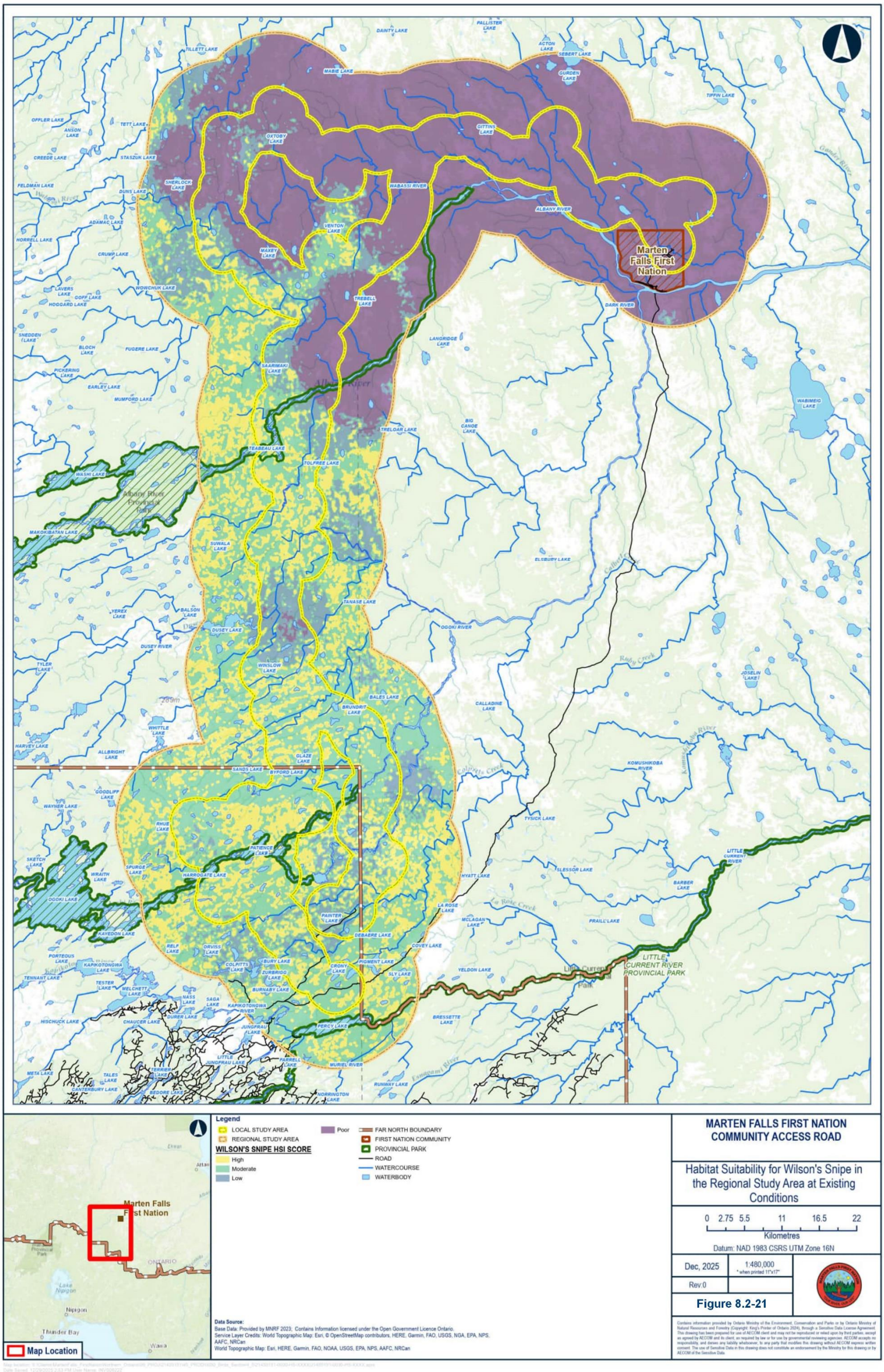
Lesser yellowlegs (Tringa flavipes; Oji-Cree translation, gaa'osaaw gaatech binechiinch) is the only shorebird Species at Risk that might be in the Project study areas. Sixteen shorebird species in the study areas are considered priority species in Bird Conservation Region 7 or 8. Eight of these priority species were found during field surveys from 2018 to 2022.

Wilson's Snipe as chosen to represent the shorebird group in the study area. It is a Priority Species in Bird Conservation Regions 7 and 8. Surveys found Wilson's Snipe in similar numbers in coniferous forests, deciduous forests, fens, and marshes. They were most often detected south of Dusey Lake. The highest number of Wilson's Snipe was in the Construction Disturbance Area, with about one individual per plot. Suitable habitat for them covers 50 to 60 percent of each study area. Habitat suitability for Wilson's Snipe is summarized in **Table 8.2-21** and shown on **Figure 8.2-21**.

Table 8.2-21: Habitat Suitability for Wilson's Snipe

Habitat Suitability	Construction Disturbance Area (hectare)	Construction Disturbance Area (percent)	Local Study Area (hectare)	Local Study Area (percent)	Regional Study Area (hectare)	Regional Study Area (percent)
High	3,118.8	25.1	48,942.2	19.7	132,190.2	20.0
Moderate	4,911.5	39.5	76,780.5	30.9	198,659.1	30.0
Low	1,686.3	13.6	30,176.7	12.2	66,182.2	10.0
Poor	2,711.9	21.8	92,058.4	37.1	264,741.7	40.0

Figure 8.2-21: Habitat Suitability for Wilson's Snipe in the Regional Study Area at Existing Conditions



8.2.6.4 Waterfowl and Waterbirds

Waterfowl and waterbirds, like loons, grebes, swans, geese, ducks, herons, and gulls, nest or feed around open water. There are 30 waterfowl and waterbird species in the Project study areas, and 25 of these were found during surveys from 2018 to 2022. Marten Falls First Nation has noticed that mergansers, goldeneyes, mallards, and loons are becoming rarer around Washi Lake.

There are no federally listed waterfowl or waterbird species in the study areas. Black tern (Chlidonias niger; Oji-Cree translation, gichisaga'iiganing gaadaashiyayaach binechiinch) is the only provincially listed Species at Risk but was not found during the field studies from 2018 to 2022.

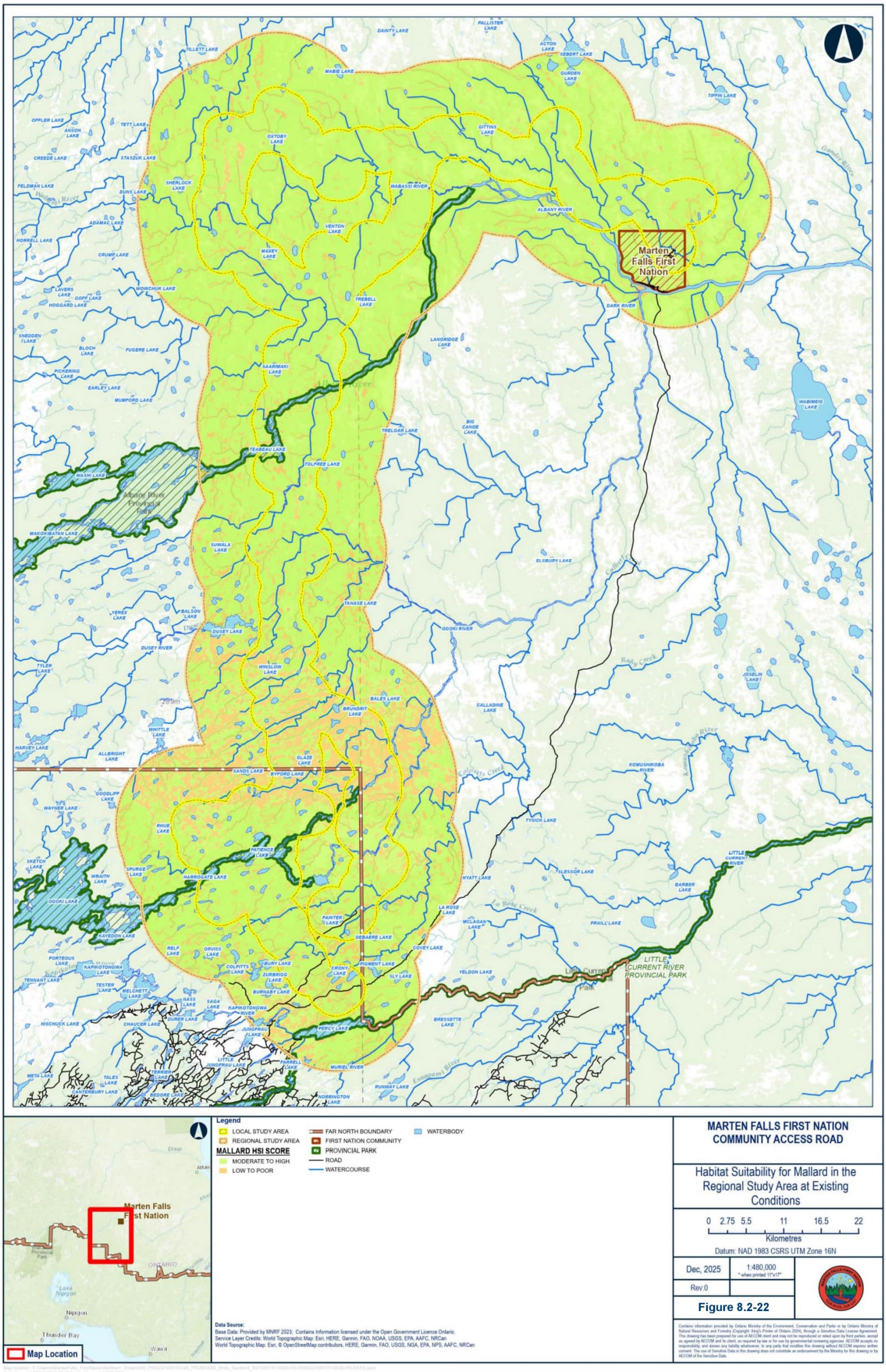
Sixteen waterfowl and waterbird species are considered priority species in Bird Conservation Region 7 or 8, and 14 of these were detected during field surveys from 2018 to 2022.

Mallards were chosen to represent waterfowl and waterbirds in the study areas. They are a Priority Species in Bird Conservation Regions 7 and 8. Mallards can be found on most waterbodies, but they prefer shallow and calm ones. Surveys found mallards in swamp and fen habitats, which are the most common in the Local Study Area, covering 29.7 percent and 37.7 percent, respectively. Mallards were found throughout much of the Local Study Area, except in the northwestern part and the Construction Disturbance Area. They were most frequently detected south of Dusey Lake. Habitat suitability for mallards are summarized in **Table 8.2-22** and shown on **Figure 8.2-22**.

Table 8.2-22: Habitat Suitability for Mallard

Habitat Suitability	Construction Disturbance Area (hectare)	Construction Disturbance Area (percent)	Local Study Area (hectare)	Local Study Area (percent)	Regional Study Area (hectare)	Regional Study Area (percent)
High to Moderate	10,144.6	81.6	213,281.9	86.4	575,058.7	86.9
Low to Poor	2,283.9	18.4	33,675.9	13.6	86,973.8	13.1

Figure 8.2-22: Habitat Suitability for Mallard in the Regional Study Area at Existing Conditions



8.2.6.5 Bog / Fen and Other Wetland Birds

Bog, fen, and other wetland birds' nest in bogs, fens, swamps, or marshes, which are common in Canada's boreal forest. All 15 wetland bird species that might be in the study area were found during surveys from 2018 to 2022.

According to desktop research, there are 15 wetland bird species that might be in the Project study areas. Eight of these are priority species in Bird Conservation Region 7 or 8, and all eight were found during surveys from 2018 to 2022.

Rusty blackbird and yellow rail are the only federally and provincially listed wetland bird species with potential to occur in the Project study areas.

The following species were selected to represent the wetland bird valued component:

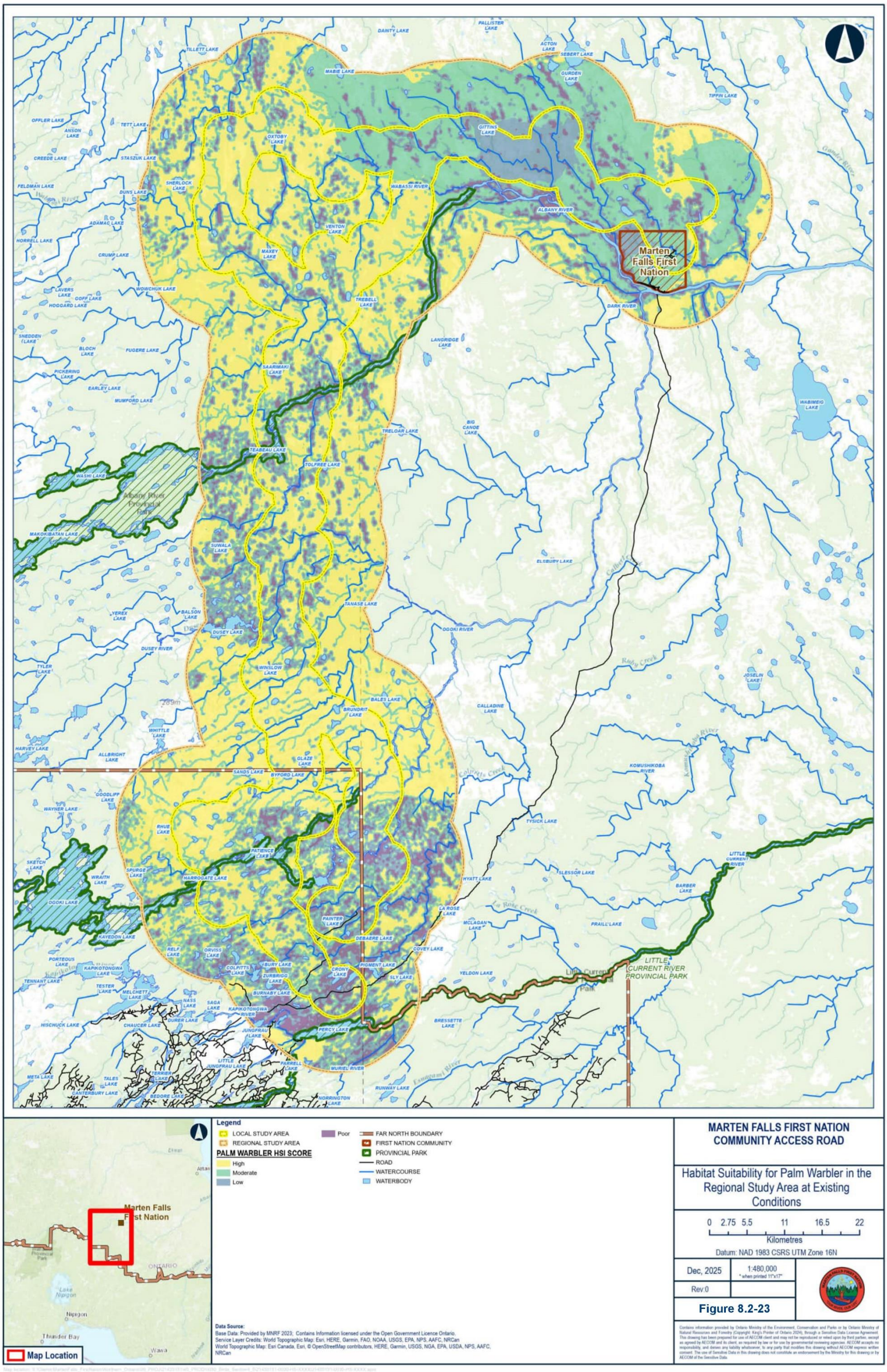
- Palm warbler: represents species that use bogs;
- Common yellowthroat: represents species that use fens;
- Northern waterthrush: represents species that use swamps; and
- Sora: represents species that use marshes.

Palm warblers are most commonly found in marshes and swamps in the Construction Disturbance Area, and in bogs, fens, and other water habitats in the Local and Regional Study Areas during surveys. The habitat model showed that palm warblers were more abundant in areas with fewer bogs and less water and mature forests. About 50 to 70 percent of each study area is suitable for palm warblers. They were evenly spread throughout the Local Study Area and were found every year from 2018 to 2022. The highest number of palm warblers was in the Local Study Area, with 0.48 individuals per plot. Habitat suitability for palm warblers are summarized in **Table 8.2-23** and shown on **Figure 8.2-23**.

Table 8.2-23: Habitat Suitability for Palm Warbler

Habitat Suitability	Construction Disturbance Area (hectare)	Construction Disturbance Area (percent)	Local Study Area (hectare)	Local Study Area (percent)	Regional Study Area (hectare)	Regional Study Area (percent)
High	4,069.7	32.7	98,440.8	39.7	264,728.3	40.0
Moderate	2,514.8	20.2	69,616.1	28.1	198,601.3	30.0
Low	3,639.5	29.3	57,317.1	23.1	132,363.7	20.0
Poor	2,204.6	17.7	22,583.9	9.1	66,072.2	10.0

Figure 8.2-23: Habitat Suitability for Palm Warbler in the Regional Study Area at Existing Conditions



Common yellowthroats were most commonly found in water habitats in the Local and Regional Study Areas, and in bogs in the Construction Disturbance Area. They were more abundant in areas with less mature forest and more riparian and fen habitats. Suitable habitat for common yellowthroats covers 50 to 60 percent of each study area. They were found throughout the Local Study Area during field studies, except in the northwestern part. The highest number of common yellowthroats was in the Local Study Area, with 0.33 individuals per plot during point count surveys. Habitat suitability for common yellowthroats is summarized in **Table 8.2-24** and shown on **Figure 8.2-24**.

Table 8.2-24: Habitat Suitability for Common Yellowthroat

Habitat Suitability	Construction Disturbance Area (hectare)	Construction Disturbance Area (percent)	Local Study Area (hectare)	Local Study Area (percent)	Regional Study Area (hectare)	Regional Study Area (percent)
High	3,400.6	27.4	99,523.9	40.1	264,950.4	40.0
Moderate	2,190.6	17.6	63,335.6	25.5	175,008.3	26.4
Low	3,336.5	26.8	59,670.2	24.1	155,851.8	23.6
Poor	3,500.9	28.2	25,428.1	10.3	66,068.6	10.0

Northern waterthrush were most commonly found in bogs in the Construction Disturbance Area, open water in the Local Study Area, and fens, swamps, and open water in the Regional Study Area. They are usually more abundant in areas more than 100 metres from forest edges. Suitable habitat is scattered throughout the study areas, mainly along watercourses. The highest number of northern waterthrush was found in the Regional Study Area, with 0.43 individuals per plot between 2018 and 2022. Habitat suitability for northern waterthrush is summarized in **Table 8.2-25** and shown on **Figure 8.2-25**.

Table 8.2-25: Habitat Suitability for Northern Waterthrush

Habitat Suitability	Construction Disturbance Area (hectare)	Construction Disturbance Area (percent)	Local Study Area (hectare)	Local Study Area (percent)	Regional Study Area (hectare)	Regional Study Area (percent)
High	1,714.5	13.8	51,225.2	20.7	132,385.4	20.0
Moderate	2,143.9	17.2	51,677.8	20.8	132,246.6	20.0
Low	2,597.0	20.9	74,934.1	30.2	198,632.9	30.0
Poor	5,973.1	48.1	70,120.8	28.3	198,490.9	30.0

Figure 8.2-24: Habitat Suitability for Common Yellowthroat in the Regional Study Area at Existing Conditions

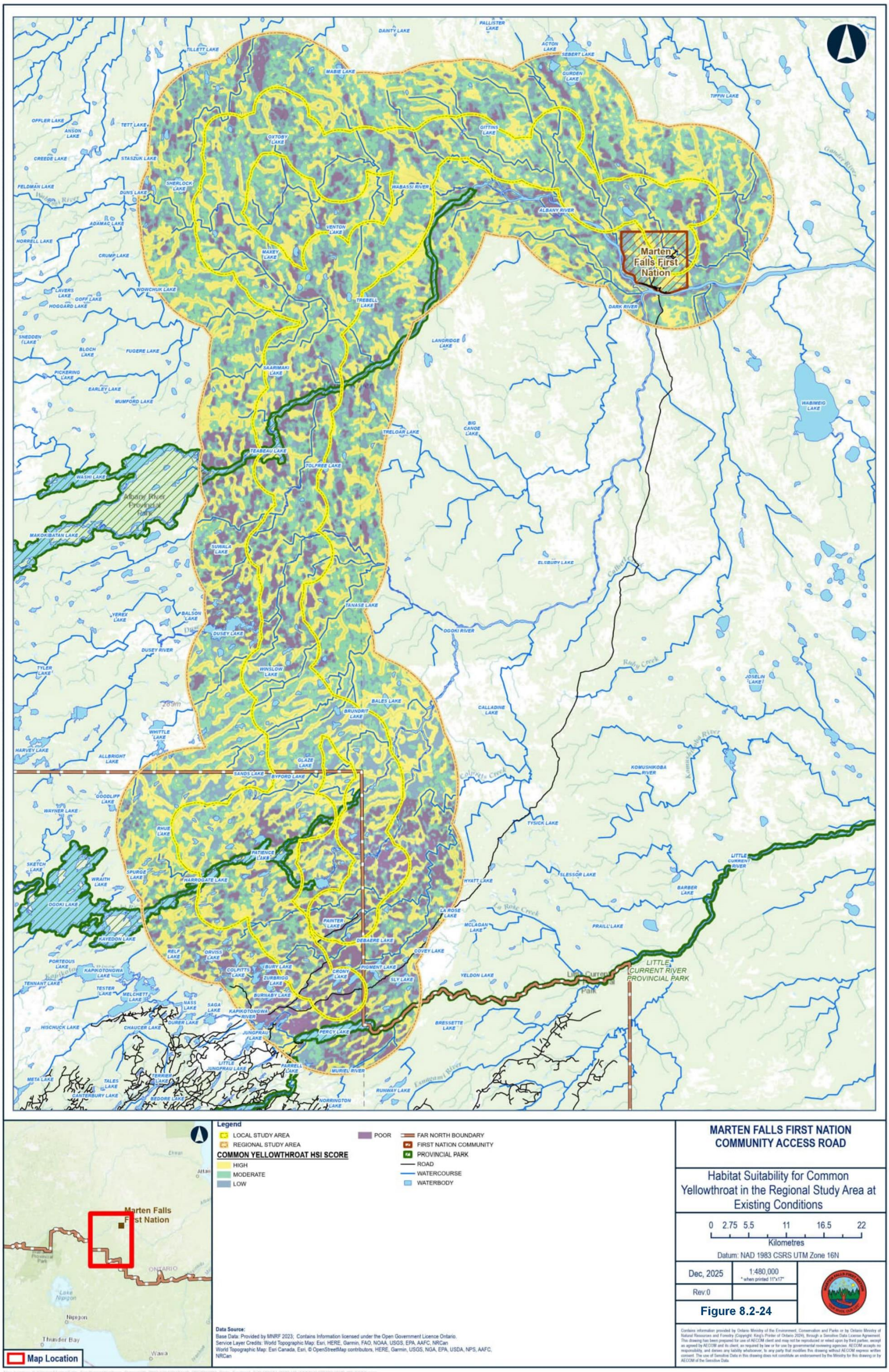
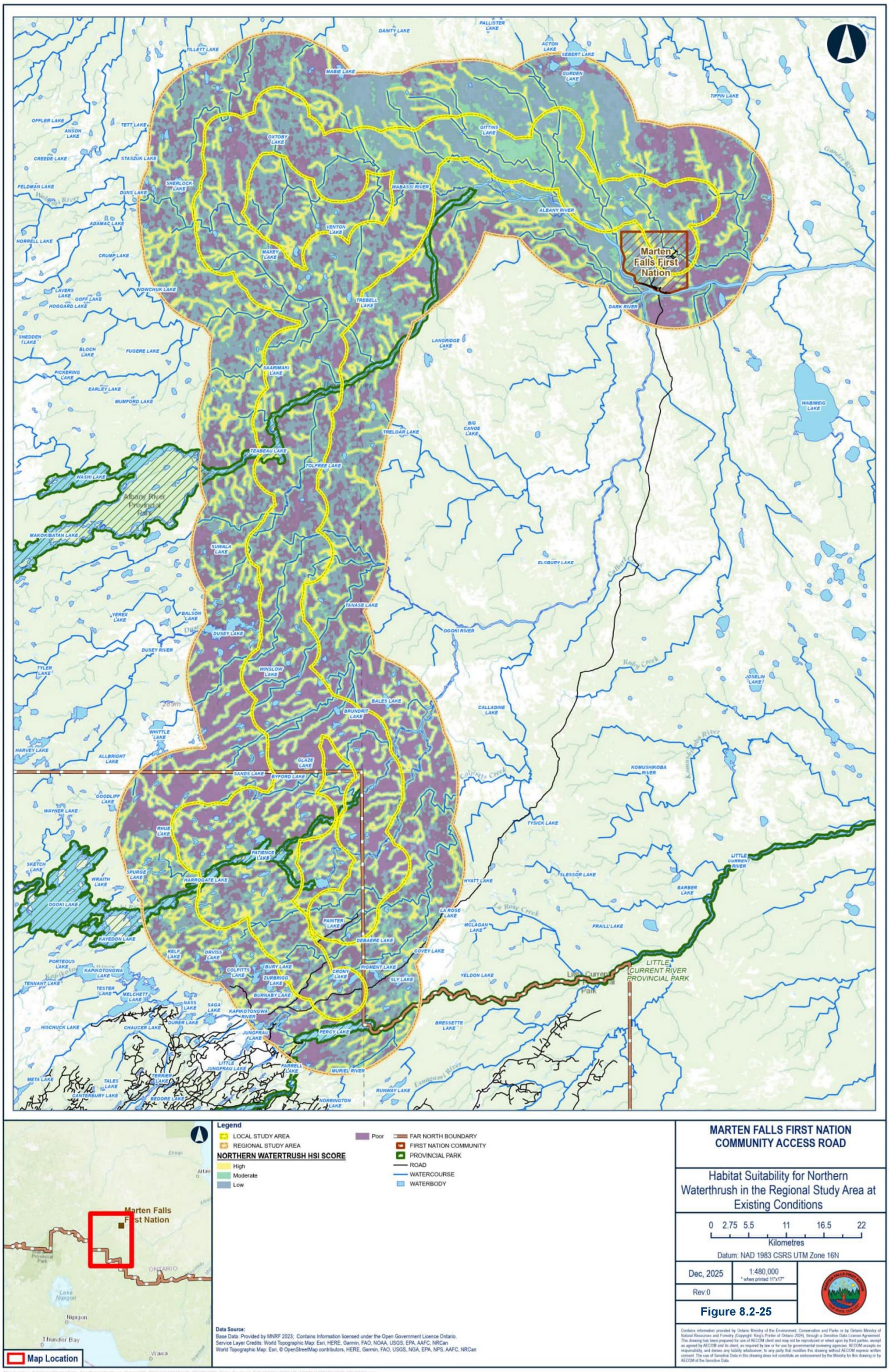


Figure 8.2-25: Habitat Suitability for Northern Waterthrush in the Regional Study Area at Existing Conditions



Soras were most commonly found in fen habitats during surveys. Climate change and wetland drying may harm their breeding habitats. Field studies found soras throughout the Local Study Area, north of Sands Lake. In 2022, surveys showed the highest number of soras in the Local Study Area, but none were found in the Construction Disturbance Area. Habitat suitability for sora is summarized in **Table 8.2-26** and shown on **Figure 8.2-26**.

Table 8.2-26: Habitat Suitability for Sora

Habitat Suitability	Construction Disturbance Area (hectare)	Construction Disturbance Area (percent)	Local Study Area (hectare)	Local Study Area (percent)	Regional Study Area (hectare)	Regional Study Area (percent)
High to Moderate	1,764.5	14.2	45,179.8	18.2	121,473.8	18.3
Low to Poor	10,664.0	85.8	202,778.1	81.8	540,558.6	81.7

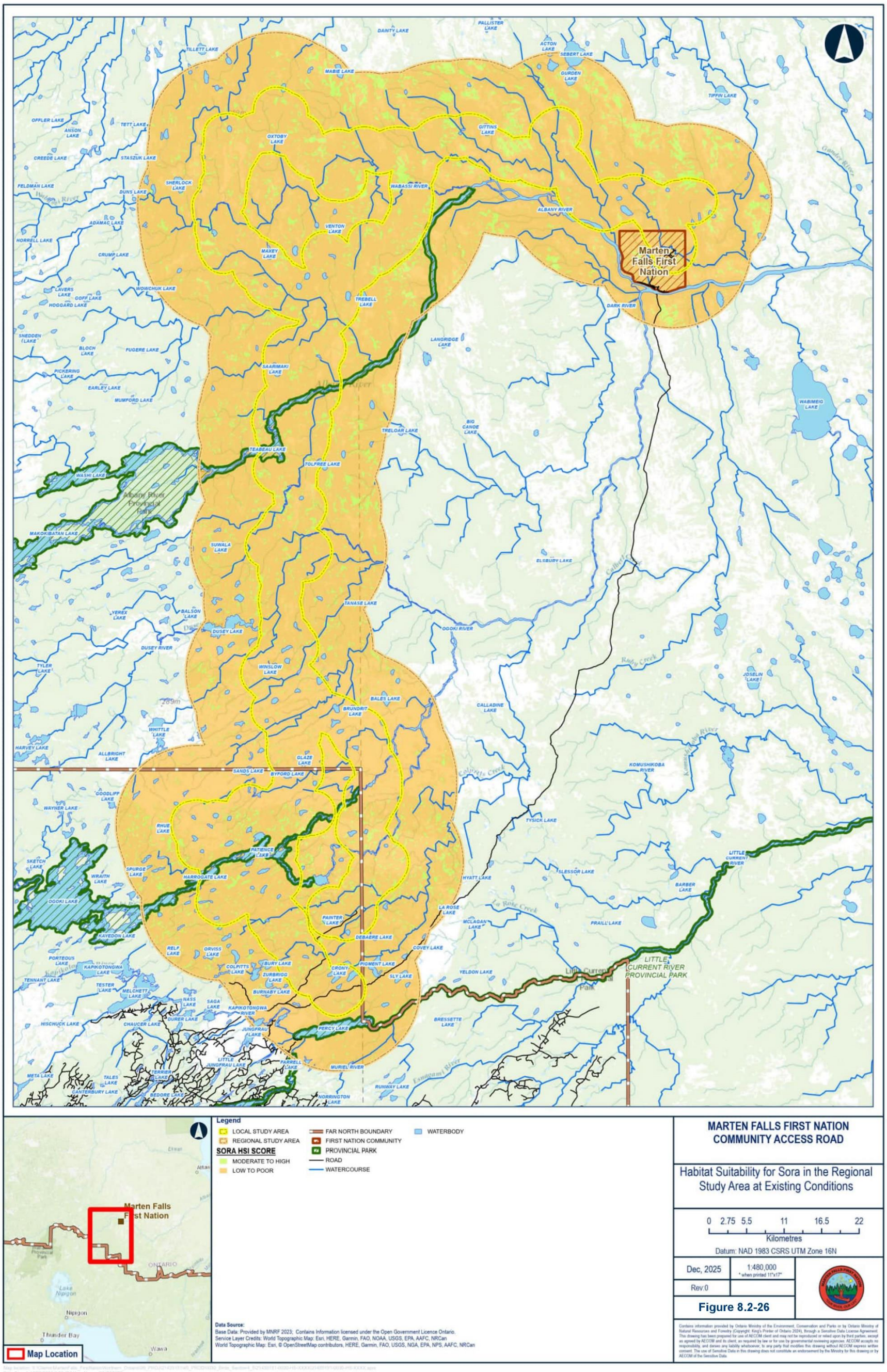
8.2.6.6 Bird Species at Risk

The Species at Risk birds discussed in the Final Environmental Assessment / Impact Statement are considered priority species in at least one of the two Bird Conservation Regions that overlap with the Community Access Road's Local and Regional Study Areas [Bird Conservation Region 7 in Ontario: Taiga Shield and Hudson Plains (Environment Canada, 2013b) and Bird Conservation Region 8 in Ontario: Boreal Softwood Shield (Environment Canada, 2014)].

The following Species at Risk birds represent the Species at Risk group because they are listed as Threatened, Endangered, or Extirpated under the federal *Species at Risk Act* and the provincial *Endangered Species Act*. Nine of the 16 species were found during surveys from 2018 to 2022:

- **Canada warbler:** listed as Threatened under the *Species at Risk Act* and as a Special Concern under the *Endangered Species Act*. They prefer to nest in wet forests with dense shrubs. In the Project study areas, they favour wet mixed forests and early successional forests. Their habitat is threatened by fires and insect outbreaks. Canada warblers were found throughout the Local Study Area during field studies, except in the northwestern part. They migrate to southern Central America and northern South America for the winter. The highest number of Canada warblers was found in the Regional Study Area, with an average of 0.10 individuals per plot during surveys from 2018 to 2022. They may be negatively affected by the global decline in flying insects, which are their main food source.

Figure 8.2-26: Habitat Suitability for Sora in the Regional Study Area at Existing Conditions



- **Evening grosbeak:** listed as a Special Concern species under both the *Species at Risk Act* and the *Endangered Species Act*. These birds usually live in mixed and young forests. They were not found during field studies for the Community Access Road, so they might not live in the Project study areas. Evening grosbeaks do not migrate. They primarily eat insects, including beetles, caterpillars, and aphids, so the global decline in insects could reduce their food supply; but will also consume plant seeds and buds (Gillihan and Byers, 2020). During the growing season the species primarily relies on insects (with a lesser component consisting of seeds and buds), while in the non-growing season the species will switch its diet to seeds and buds.
- **Chimney swift:** listed as Threatened under both the *Species at Risk Act* and the *Endangered Species Act*. Critical natural habitat for chimney swifts is not clearly defined because they usually live in urban areas and nest in chimneys. In the wild, they might use hollow trees and caves for nesting. Insect outbreaks can create more nesting spots by speeding up the decay of old trees. Chimney swifts have not been seen north of the 49th parallel and are not expected to be in the Project study areas. They were not found during field studies.
- **Bank swallow:** listed as Threatened under both the *Species at Risk Act* and the *Endangered Species Act*. Found near large rivers, pits, and quarries. They breed in vertical banks and cliffs along waterbodies. Activities like erosion control, flood management, and deforestation can threaten their breeding and feeding areas. There is no critical habitat for bank swallows in the Regional Study Area, but they are believed to tolerate human activity. No bank swallows were seen in the Project study areas during field studies from 2018 to 2022. There is also a bank swallow record (2021) of possible breeding on the Ontario Breeding Bird Atlas located approximately 22 kilometres northeast of the existing conditions Regional Study Area.
- **Barn swallow:** listed as Special Concern under the *Endangered Species Act* and Threatened under the *Species at Risk Act*. Often nest in human-made structures like bridges, tunnels, culverts, and buildings. Before European settlement, they likely nested in cliffs and caves. The Local and Regional Study Areas do not have much suitable habitat for barn swallows. In the boreal regions, where there is less human disturbance, they breed in recently disturbed areas and places with rivers, waterbodies, and marshes. No barn swallows were seen in the Project study areas during field studies from 2018 to 2022.
- **Common nighthawk:** listed as a Special Concern species under the *Species at Risk Act* and the *Endangered Species Act*. They prefer open or semi-open

habitats and are most common in boreal areas with large burns in Ontario. For the Community Access Road, recording units found the highest numbers of common nighthawks in coniferous and fen habitats within the Local Study Area and Construction Disturbance Area. About 40 to 50 percent of each study area has suitable habitat for them. Climate change, with more frequent fires and insect outbreaks, might be increasing their habitat in these areas compared to the past. Although their numbers are declining in Ontario, they are still common on the southern edge of the Canadian Shield. There's a large suitable habitat patch between Ogoki River and Dusey Lake in the southern part of the study areas. Habitat fragmentation is not likely to affect them. During field surveys, common nighthawks were detected in the Construction Disturbance Area by recording units but not by point count stations. They were also found by recording units and one point count station in the Local Study Area but not in the existing conditions Construction Disturbance Area or Regional Study Area. This species migrates to South America for the winter.

- **Eastern whip-poor-will:** recently re-assessed and downlisted to Special Concern by the Committee on the Status of Endangered Wildlife in Canada and the Committee on the Status of Species at Risk in Ontario. It is expected to be downlisted under the *Species at Risk Act* and the *Endangered Species Act* in the future. These birds prefer semi-open or patchy forests and avoid wide-open spaces and dense forests. They like even-aged successional habitats and are uncommon in mature forests. Transmission line rights-of-way and road corridors may provide good foraging areas for them. During surveys, eastern whip-poor-wills were most commonly found in coniferous forest habitats. The nearest critical habitat for them is about 250 kilometres southwest of the Regional Study Area. Climate change, with more fires and insect outbreaks, might be increasing their habitat in the Project study areas compared to the past. Habitat fragmentation is not likely to affect them. Eastern whip-poor-wills were detected at one survey station in the Local Study Area but not during point count surveys. They migrate to South America for the winter.
- **Eastern wood-pewee:** listed as a Special Concern species under the *Species at Risk Act* and the *Endangered Species Act*. They usually nest in clearings and edges of deciduous and mixed forests, which make up 2.6 percent and 0.2 percent of the Local Study Area, respectively. Most of their suitable habitat is in the southern half of the Local Study Area. Eastern wood-pewees were found in coniferous forests and bogs during point count surveys, and in deciduous forests during autonomous recording unit surveys. They are common south of the boreal forest in Ontario but were not historically seen north of Lake Nipigon. However,

field surveys found them in both the southern and northern parts of the Project study areas. This species migrates to northern South America for the winter. The eastern wood-pewee may be negatively affected by the global decline in flying insects, as they primarily eat these insects.

- **Olive-sided flycatcher:** listed as Special Concern under both the *Species at Risk Act* and *Endangered Species Act*. Often found in burned areas, logged areas, and natural forest openings, which help them hunt flying insects. They were most commonly seen in fen and swamp habitats in the Construction Disturbance Area, bog and marsh habitats in the Local Study Area, and swamp and early successional sparse treed habitats in the Regional Study Area. During surveys, they were mostly detected in fen habitats, followed by swamp habitats. About 30 to 60 percent of the study areas have suitable habitat for them. Olive-sided flycatchers were found throughout the study areas during field studies. They migrate to Central America and northern South America for the winter. Point count surveys showed their highest numbers (0.27 individuals per plot) in the Regional Study Area. In 2022, they were only detected in the Local Study Area (0.77 individuals per plot) during autonomous recording unit surveys.
- **Bald eagle:** listed as Special Concern under the *Endangered Species Act*. Found near water with forested shorelines or cliffs. They prefer to nest in mature or Old-Growth Forests. During aerial surveys, they were often seen at large waterbodies and watercourses. Point count surveys found them in swamp habitats, and recording units detected them in fen habitats. Indigenous Knowledge from Marten Falls First Nation and Kingfisher Lake First Nation confirms their presence in the Project study areas and Pipestone River Provincial Park. Bald eagles usually nest in areas with little human disturbance, but they seem to be getting more used to human activities. They were found throughout the Local Study Area, especially near the Ogoki River. They migrate to southern North America for the winter. Forest fragmentation does not seem to affect them, but climate change might, as it could impact the fish they eat by changing water temperatures.
- **Peregrine falcon:** listed as Special Concern under the *Endangered Species Act*. Peregrine falcons' nest on cliffs with open spaces and in urban areas. The Project study areas do not have much suitable habitat for them because steep slopes are rare in the Local Study Area. Peregrine falcons were not found during field studies for the Community Access Road.
- **Short-eared owl:** listed as Threatened under the *Endangered Species Act* and Special Concern under the *Species at Risk Act*. Nest in open grassland and

wetland habitats with short, dense grass or small willows. Human activities like building roads can fragment their habitat and pose a threat. About 19 to 37 percent of the Project study areas have suitable habitat for them. They are uncommon in Ontario and were not found during field studies for the Community Access Road, but their range might be expanding due to climate change. Short-eared owls are at risk of being hit by vehicles or getting caught in barbed wire fences because they fly low.

- **Black tern:** listed as Special Concern under the *Endangered Species Act*. Nest in shallow waterbodies, peat bogs, and marshes with dense vegetation to protect them from waves. They can be negatively affected by habitat loss and fragmentation due to human activities, but there is little human disturbance in the Project study areas. Water and marsh habitats cover 3.8 percent and 2 percent of the Local Study Area, respectively. Climate change, which can cause wetlands to dry up, may also negatively affect them. Historically, black terns were widespread in the boreal forest and Hudson Bay Lowlands, but now they are mostly found in southern Ontario. They were not detected during field studies for the Community Access Road. Suitable habitats, like marshes, are patchily available in the Project study areas. Black terns nest on open water, making them sensitive to bad weather and strong winds. Climate change, with more intense storms, may increase the risk of nest loss in the Project study areas. As migratory birds, they may also be affected by stronger storms during migration.
- **Lesser yellowlegs:** listed as Threatened under the *Endangered Species Act*. Nest in areas with a mix of shallow wetlands, trees or shrubs, and open spaces. Field studies for the Community Access Road only found them in fen habitats, which are the most common wetland type in the Local Study Area, covering 37.7 percent. They were detected by recording units in the Local Study Area but not in the Construction Disturbance Area. Greater yellowlegs were not found during point count surveys. Like other migratory birds, extreme weather events like hurricanes can cause direct deaths of lesser yellowlegs or carry them far from their usual wintering areas. They may also be negatively affected by the global decline in flying insects, as they mainly eat insects. They consume a wide variety of both land and water species.
- **Rusty blackbird:** listed as Special Concern under both the *Endangered Species Act* and *Species at Risk Act*. They prefer wooded wetlands like peat bogs, treed fens, swamps, sedge meadows, and marshes. During the Project's point count surveys, they were found in fen and swamp habitats, with the highest numbers in fen habitats during recording unit surveys. Rusty blackbirds may be affected by fires and insect outbreaks, which can harm their habitat. They were found

throughout the Local Study Area and Construction Disturbance Area. They migrate to the southeastern United States for the winter. They might be sensitive to habitat fragmentation. The highest average numbers of rusty blackbirds were in 2022 and 2019 (0.02 individuals per plot), and the lowest was in 2018 (0.1 individuals per plot), based on point count surveys. As migratory birds, they may also be affected by stronger storms during migration.

- **Yellow rail:** listed as Special Concern under both the *Endangered Species Act* and *Species at Risk Act*. Yellow rails nest mainly in wet sedge meadows, preferring areas with slender sedge (Carex lasiocarpa), but they will also nest in other sedges or rushes. They need water less than 15 centimetres deep for nesting. Yellow rails may be vulnerable to fire because they need dense grass mats for cover. They can also be affected by changes in water levels due to drought or heavy rain. Yellow rails are locally common in the James Bay and Hudson Bay Lowlands. In 2022, they were detected at one survey station in the southern part of the Local Study Area. They were not found during point count surveys because they are nocturnal. Yellow rails migrate to the southeastern United States for the winter. Like other migratory birds, they can be affected by extreme weather during migration. Habitat degradation from human activity is expected to have a serious impact on yellow rails, but they are thought to be adaptable and resilient to human disturbances within the Project study areas.

8.2.7 Ungulates

Caribou and moose are culturally and traditionally important for Marten Falls First Nation. Moose meat is commonly shared with family, Elders, and community members, and almost all parts of the moose are used for different purposes (Marten Falls First Nation, 2023b).

The complete description of ungulates existing conditions is documented in the Ungulates Technical Support Document (**Appendix M**).

8.2.7.1 Boreal Caribou

Boreal caribou are a Threatened species on the federal *Species at Risk Act* (Government of Canada, 2002) and provincial *Endangered Species Act* (Government of Ontario 2007). Eastern migratory caribou are listed as “Special Concern” on Ontario’s *Endangered Species Act* (Government of Ontario, 2007). Federally, they have been assessed as “Endangered” by Committee on the Status of Endangered Wildlife in Canada (2017b), and a recommendation has been made to add them to Schedule 1 of the *Species at Risk Act*. They serve an important role as an umbrella species for other

wide-ranging wildlife species, as well as for regional biodiversity. Importantly, caribou are a valuable resource culturally and traditionally to local Indigenous groups.

The information presented for each range is based on the landcover and disturbance metrics developed for this Environmental Assessment and updated information provided by the Ministry of Environment, Conservation and Parks through comments received on the Draft Environmental Assessment / Impact Statement. Additional caribou collar data received after the Draft Environmental Assessment / Impact Statement was published (in other words, Community Access Road collar data from April 2023 to February 2025, Ministry of Natural Resources collar data from March 2023 to October 2024, Webequie Supply Road collar data from March 2021 to February 2025, and Northern Road Link collar data from March 2023 to May 2025) were used to update the analyses presented in the Draft Environmental Assessment / Impact Statement and in this Final Environmental Assessment / Impact Statement.

The four provincially delineated caribou ranges that make up the caribou existing conditions Regional Study Area are Missisa, Ozhiski, Nipigon and Pagwachuan, each of which are fully encompassed in the caribou existing conditions Regional Study Area. The ungulate existing conditions Local Study Area is primarily located within the Missisa range (70 percent of existing conditions Local Study Area; **Table 8.2-27**). The federal and provincial caribou range boundaries as well as the ungulate study areas are shown on **Figure 8.2-27**.

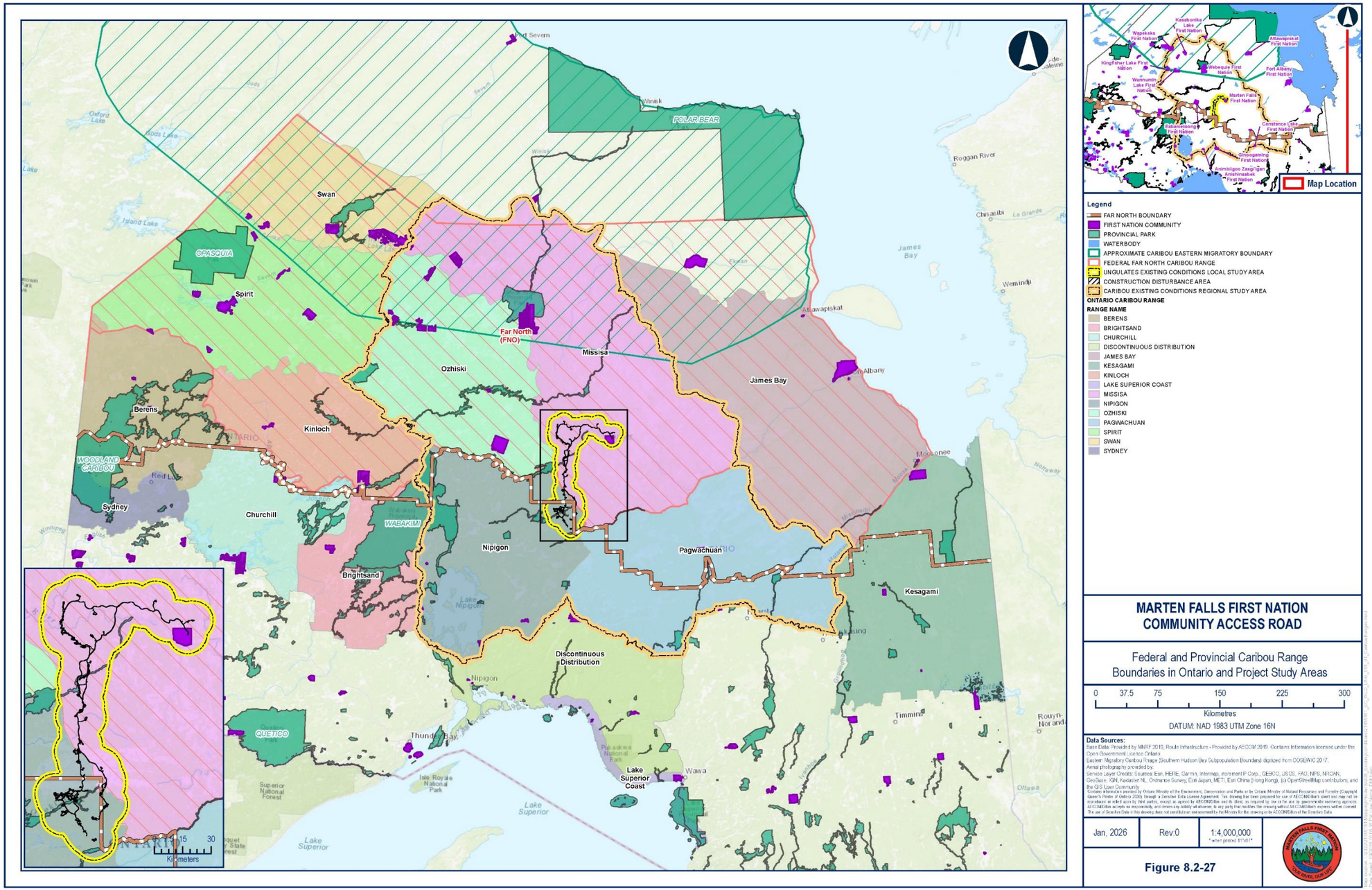
Table 8.2-27: Caribou Ranges Intersected by the Ungulate Local Study Area and Caribou Regional Study Area

Boreal Caribou Range	Total Area of Caribou Range (hectare)	Ungulate Local Study Area - Overlap (hectare)	Ungulate Local Study Area (percent)	Caribou Regional Study Area - Overlap (hectare)	Caribou Regional Study Area (percent)
Missisa	6,977,855	432,620	70.5	6,977,855	36.2
Nipigon (ON5)	3,865,996	179,933	29.3	3,865,996	20.1
Ozhiski	3,879,337	1,178	0.2	3,879,337	20.2
Pagwachuan (ON7)	4,527,565	0 (Footnote a)	0.0	4,527,565	23.5
Total	**19,250,753**	**613,731**	**100**	**19,250,753**	**100**

Footnotes: Totals may vary slightly due to rounding.

(a) Early stages of the Community Access Road included two eastern route alternatives which, when buffered, would have intersected the Pagwachuan Range. As such, the Tailored Impact Statement Guidelines directed the Community Access Road to include Pagwachuan in the caribou Regional Study Area.

Figure 8.2-27: Federal and Provincial Caribou Range Boundaries in Ontario and Project Study Areas



Field investigations were conducted from 2019 to 2023 and consisted of caribou collaring and mortality investigations, two winter recruitment and distribution aerial surveys and a remote camera monitoring program. Targeted field investigations were designed to collect wildlife and Species at Risk data that met requirements in the Tailored Impact Statement Guidelines. Incidental observations of ungulates were also recorded during other field surveys.

In February 2021, 30 collars were placed on adult female caribou, and biological samples were collected. Of these, 25 (83 percent) were pregnant at the time. From September 2021 to March 2023, nine collared caribou died, mostly in conifer swamps and black spruce forests, with wolf predation being the most common cause of death. Two occurred outside the caribou existing conditions Regional Study Area, in the calving and summer range of eastern migratory caribou on the coast of Hudson Bay. Habitat type where mortalities occurred was most commonly conifer swamp and black spruce forest, and the most common cause of death was predation by wolves. As of March 31, 2023, 19 collars were still active (nine animals died, and two collars malfunctioned and were removed).

Aerial surveys in February 2022 and February 2023 observed 184 caribou in 2022 and 457 in 2023, mostly in treed bog and fen habitats (for more information refer to Section 5.1.1.5 in **Appendix M**). Most identified caribou were female, with calves making up 26 percent of the observed caribou in 2022 and 18 percent in 2023. Caribou tracks and crater sites were found throughout the Local Study Area, especially in the northern part. Further details are described below.

8.2.7.1.1 Habitat Availability

Caribou habitat availability depends on natural land features with certain physical characteristics and the occurrence of natural disturbances like wildfires, as well as human activities.

Ontario's General Habitat Description divides boreal caribou habitat into three categories to identify habitat features from lowest to highest tolerance to alteration (Ministry of the Environment, Conservation and Parks, 2025). The amount of protected habitat for caribou (such as, Category 1, 2, and 3 habitat), that are available in the ungulate existing conditions Local Study Area and caribou existing conditions Regional Study Area are summarized in **Table 8.2-28**. In cases where areas identified as "known" Category 2 or Category 3 (in other words, from the provincial General Habitat Description data) were identified as "potential new" Category 1 or Category 2 areas with the collar data collected for the Project, areas were always "uplisted" to be conservative in the identification of important areas.

Table 8.2-28: Caribou Known and Potential Functional Habitat in the Ungulate Local Study Area and Caribou Regional Study Area

Study Area	Habitat Category (Footnote a)	Habitat Category (Footnote a) – Area (hectare) / Percent	Category 1 - Nursery Areas (excluding water)	Category 1: Nursery Areas (water)	Category 1: Nursery Areas Total	Category 1: Winter Use Areas	Category 1: Travel Corridors	Total Category 1 (Footnote b)	Category 2: Seasonal Ranges	Category 3: Remaining Areas within the Range (Footnote C)	Category 3: Water (Footnote d)	Category 3: Permanent Disturbances (Footnote d)	Category 3 Total	Study Area Total (hectare)
Ungulate Local Study Area	Known Areas (Footnote e)	Area (hectare)	31,001	2,118	33,120	106,799	0	**125,834**	384,062	93,554	4,908	5,440	**103,902**	613,797
Ungulate Local Study Area	Known Areas (Footnote e)	Percent of the Local Study Area	5%	0%	5%	0%	0%	**21%**	63%	15%	1%	1%	**17%**	100.0%
Ungulate Local Study Area	Potential Areas (Footnote f)	Area (hectare)	226,383	6,107	232,490	346,836	150,123	**376,754**	66,551	156,158	9,990	4,344	**170,493**	613,797
Ungulate Local Study Area	Potential Areas (Footnote f)	Percent of the Local Study Area	37%	1%	38%	57%	24%	**61%**	11%	25%	2%	1%	**28%**	100%
Ungulate Local Study Area	Combined (Footnote g)	Area (hectare)	237,243	7,908	245,151	349,926	150,123	**382,581**	173,903	53,254	2,862	1,197	**57,313**	613,797
Ungulate Local Study Area	Combined (Footnote g)	Percent of the Local Study Area	39%	1%	40%	57%	24%	**62%**	28%	9%	0%	0%	**9%**	100%
Caribou Regional Study Area	Known Areas (Footnote e)	Area (hectare)	3,506,424	581,126	4,087,550	1,292,080	0%	**2,779,242**	10,838,736	4,682,906	478,579	471,290	**5,632,775**	19,250,753
Caribou Regional Study Area	Known Areas (Footnote e)	Percent of the Regional Study Area	18%	3%	21%	7%	0%	**14%**	56%	24%	2%	2%	**29%**	100%
Caribou Regional Study Area	Potential Areas (Footnote f)	Area (hectare)	3,506,424	317,239	3,823,663	8,861,110	5,069,969	**9,456,579**	1,488,327	6,902,049	867,385	536,413	**8,305,847**	19,250,753
Caribou Regional Study Area	Potential Areas (Footnote f)	Percent of the Regional Study Area	18%	2%	20%	46%	26%	**49%**	8%	36%	5%	3%	**43%**	100%
Caribou Regional Study Area	Combined (Footnote g)	Area (hectare)	4,498,653	881,211	5,379,864	9,606,636	5,069,969	**11,387,499**	4,333,005	2,897,123	218,127	414,998	**3,530,248**	19,250,753
Caribou Regional Study Area	Combined (Footnote g)	Percent of the Regional Study Area	23%	5%	28%	50%	26%	**59%**	23%	15%	1%	2%	**18%**	100%

Footnotes: Some numbers are rounded for presentation purposes. Therefore, it may appear that the totals do not equal the sum of the individual values.

(a) Habitat categories are described in Ministry of the Environment, Conservation and Parks (2025) and Ministry of the Environment, Conservation and Parks (2022b, personal communication).

(b) Sub-categories within Category 1 habitat are not mutually exclusive. Therefore, the total for Category 1 is not a direct sum of Category 1 nursery areas, winter areas, and travel corridors.

(c) Remaining areas within the range, excluding water and disturbances.

(d) In Category 3 areas that overlapped with both water and disturbances, the area was included within water.

(e) Represents the full extent of the General Habitat Description mapping product provided by the Ministry of Natural Resources and Forestry and does not remove areas of functional habitat that overlap with existing disturbances.

(f) Potential new areas delineated according to methods.

(g) Areas that overlap in the same known and potential new category type were not double counted. Where areas identified as “known” Category 2 or known Category 3—based on provincial General Habitat Description data—were identified as “potential new” Category 1 or Category 2 areas with the collar data collected for the Community Access Road, areas were “uplisted” to be conservative in the identification of important areas.

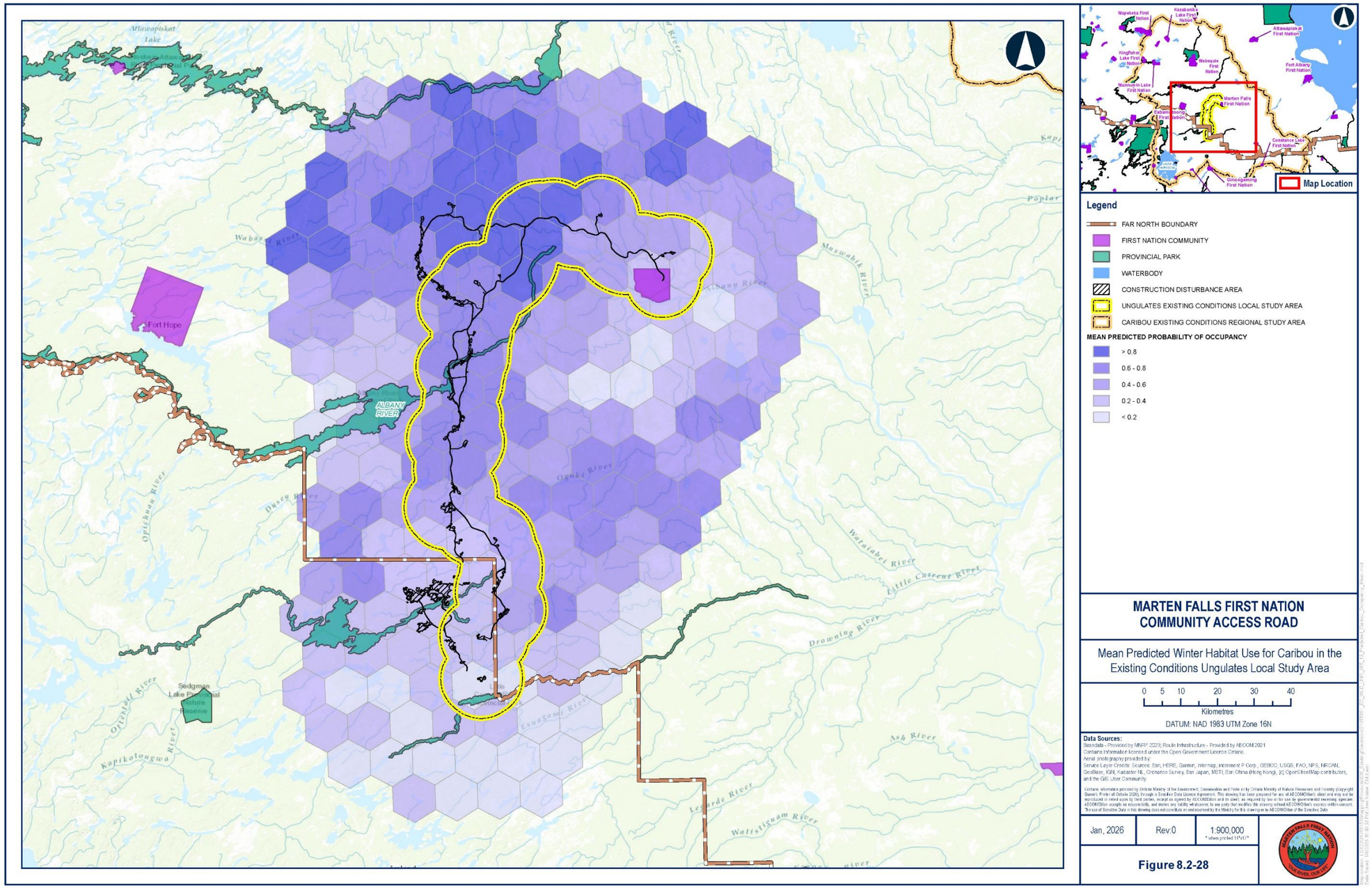
At the time of the analyses for the Draft Environmental Assessment / Impact Statement and route selection were conducted (2019 to 2023), in the Local Study Area, 40 percent of the land is important for caribou nurseries (Category 1), and 57 percent is important for their winter use (Category 1). These key areas are mostly in the northern and central parts of the Local Study Area, overlapping with the Missisa range. There are no known Category 1 travel corridors for caribou in the Local Study Area, but data from tracking collars identified 150,123 hectares of potential new Category 1 travel corridors in the northern part of the Local Study Area. As a result, 382,581 hectares (62 percent) of the ungulate existing conditions Local Study Area is considered Category 1 habitat for caribou. Known and potential new Category 2 seasonal use areas account for 28 percent (173,903 hectare) of the ungulate existing conditions Local Study Area. Category 3 general use areas, except for water and permanent disturbances, account for 9 percent of the Local Study Area (57,313 hectare). The remainder of the Category 3 areas in ungulate existing conditions Local Study Area are permanent disturbances (1,197 hectares; 0.2 percent) or water (2,862 hectares; 0.5 percent).

The caribou existing conditions Regional Study Area includes the Missisa, Ozhiski, Nipigon and Pagwachuan ranges. Each of these ranges have different amounts of known and potential new protected habitat under existing conditions but are combined in **Table 8.2-28** as totals for the caribou existing conditions Regional Study Area rather than per range.

There are three provincial parks located within the ungulates effects assessment Local Study Area: Ogoki River Provincial Park, Albany River Provincial Park, and Little Current River Provincial Park. Of these, only the Albany River Provincial Park overlaps with the Project's Construction Disturbance Area (5.7 hectares or 0.1 percent). Protected area covers 8,326.5 hectares (1.8 percent) of the ungulate effects assessment Local Study Area. In the caribou effects assessment Regional Study Area, 688,973 hectares (3.6 percent) are provincial parks. This includes portions of or all of 20 other parks in addition to those in the Local Study Area. There are no federally protected areas in the caribou effects assessment Regional Study Area.

Caribou used the northern part of the Local Study Area a lot during winter and used the central part of the Local Study Area moderately (**Figure 8.2-28**). During both years, caribou spent more time in treed bogs and fens, which are common in the central and northern parts of the study area. They spent less time in the southern parts, where there were more human activities like forestry. Caribou preferred areas far from communities and buildings, which matches other findings in Northern Ontario (Berglund et al., 2014, Poley et al., 2014). In 2022, caribou were predicted to use areas with sparse trees more in winter. In 2023, they were predicted to use treed bogs and fens more. Their use of open bogs and fens changed between the years, with a slight increase in 2022 and a decrease in 2023. This variation in how caribou use bogs and fens has been seen before in Northern Ontario, especially in different ecozones where the amount of these habitats varies (Poley et al., 2014).

Figure 8.2-28: Mean Predicted Winter Habitat Use for Caribou in the Existing Conditions Ungulates Local Study Area



The southern part of the caribou Regional Study Area is less suitable for caribou because there are more human activities and natural disturbances, and less lichen. This means caribou use these areas less. Some areas might be used seasonally but were not identified because the caribou there were not tracked. However, since the southern part of the caribou Regional Study Area also has low habitat quality, it is likely caribou do not use it as much as the northern part.

In their review of the Draft Environmental Assessment / Impact Statement, the Ministry of Environment, Conservation and Parks provided more recent estimates (unpublished) of cumulative disturbance for boreal caribou in the Missisa, Ozhiski, Nipigon, and Pagwachuan ranges). The provincial updates included removing the generalized mineral claims data, which over-inflated earlier estimates, and instead used operational cell claim data (Ministry of the Environment, Conservation and Parks, 2025). The Missisa range was estimated to have 8.4 percent cumulative disturbance in 2022, while the Ozhiski range was estimated to have 20.5 percent cumulative disturbance in 2022. Both these ranges are less than the 35 percent disturbance threshold. The Pagwachuan Range was estimated to be 33.7 percent disturbed, while the Nipigon range was estimated to be 40.9 percent disturbed in 2022. These two ranges are close to (Pagwachuan) or exceeding (Nipigon) the disturbance threshold, but remained relatively stable in the amount of cumulative disturbance from 2011 to 2022 (Ministry of the Environment, Conservation and Parks, 2025).

Empirical resource selection function models (Boyce and McDonald, 1999; Lele et al., 2013) were developed using data from collared caribou to predict habitat quality in the ungulate effects assessment Local Study Area, caribou effects assessment Regional Study Area and in each caribou range (Missisa, Nipigon, Ozhiski, Pagwachuan) for calving, summer, fall, winter, and pre-calving seasons. Models developed for the Draft Environmental Assessment / Impact Statement were updated with new collar data received from the animals collared for the Project, and from other Projects in the region. Collar data were collected from adult female caribou and included data from:

- 30 caribou collared for the Project (February 16, 2021, to February 11, 2025);
- 14 caribou collared for the Northern Road Link project (March 9, 2023, to May 15, 2025);
- 30 caribou collared for the Webequie Supply Road project (February 2, 2021, to February 28, 2025), and
- 159 caribou collared in the Missisa and Ozhiski ranges (May 18, 2019, to October 31, 2024) by Ministry of Natural Resource researchers as part of ongoing provincial monitoring program.

Some individuals that were collared in boreal caribou range were later identified as eastern migratory ecotype after tracking their movements to calving grounds on the coast of Hudson Bay. Detailed methods related to how caribou collar data were compiled and analyzed, how models were used to predict habitat quality, and how the predictive capabilities of the models were assessed are described in **Appendix M**.

8.2.7.1.2 Habitat Distribution

Historically, there were high concentrations of caribou in winter in the Hudson Bay Lowlands of northwest Ontario. There were a moderate to high number in the James Bay Lowlands, which includes most of the Local Study Area and caribou existing conditions Regional Study Area. The fewest caribou were found along the Hudson Bay coastline (Magoun et al., 2005; Berglund et al., 2014). From 2020 to 2022, collared caribou showed higher winter activity in the northwest part of the caribou existing conditions Regional Study Area (**Figure 8.2-29** and **Figure 8.2-30**). The smaller calving ranges reported here using collared data from 2020 to 2022 is similar to the findings reported by Berglund et al. (2014), who noted that out of their summer, fall, winter and pre-calving seasonal ranges, the summer ranges were smallest, and the winter ranges were largest. Since the 1960s, eastern migratory caribou have been spending their summers further east along the Hudson Bay coast (Magoun et al., 2005; Abraham et al., 2012; Newton et al., 2015); this aligns with the concentrated use during calving and summer seasons in the northeast corner of the province, outside the caribou existing conditions Regional Study Area, by eastern migratory caribou collared for the Community Access Road.

Caribou evaluated in this Impact Assessment / Environmental Assessment tended to prefer peatland areas and avoid upland forests where there are more moose and predators. They also avoided large bodies of water, although their response to water can change with the seasons.

Caribou appear to travel through the northern, northeastern, and central portions of the caribou existing conditions Regional Study Area to reach their calving and winter ranges, indicating good connectivity in these regions. However, there are insufficient data on caribou in the southern part of the study area to understand connectivity there. Ministry of Natural Resources and Forestry has noted that many human-made disturbances and linear features in the Nipigon and Pagwachuan ranges may have reduced connectivity and movement in these areas (Ministry of Natural Resources and Forestry, 2014a, 2014b). Overall, there are few disruptions from human activities in the study area and in the Missisa and Ozhiski caribou ranges in the northern part of the caribou existing conditions Regional Study Area. Currently, caribou survival and reproduction do not seem to be limited by connectivity issues in the caribou existing conditions Local Study Area and northern portion of the caribou existing conditions Regional Study Area. **Table 8.2-29** outlines the start and end dates that collared caribou travelled within pre-calving and fall travel corridors.

Figure 8.2-29: Distribution of Seasonal Ranges within the Existing Conditions Caribou Regional Study Area

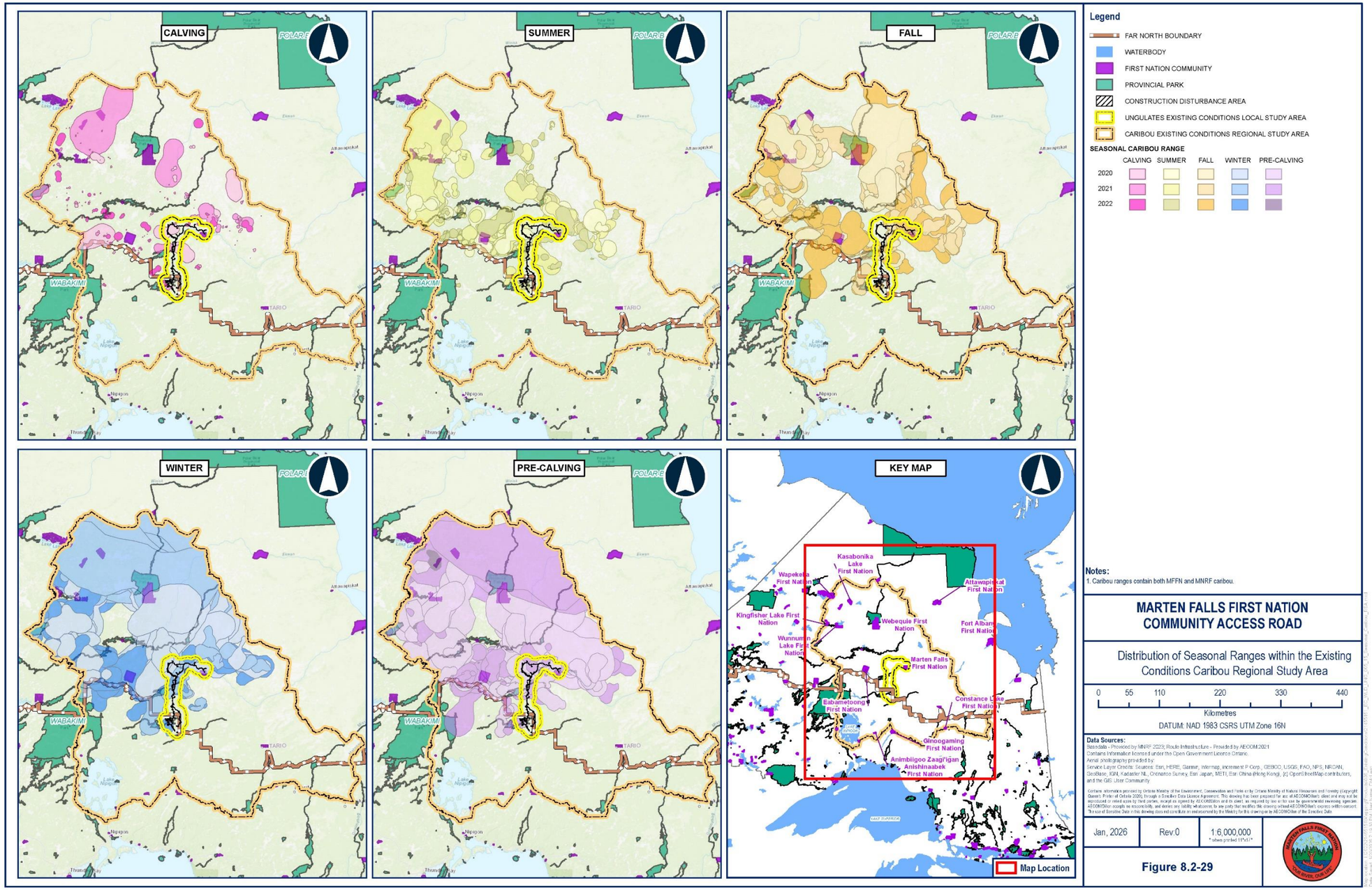


Figure 8.2-30: Distribution of Seasonal Ranges within the Existing Conditions Ungulates Local Study Area

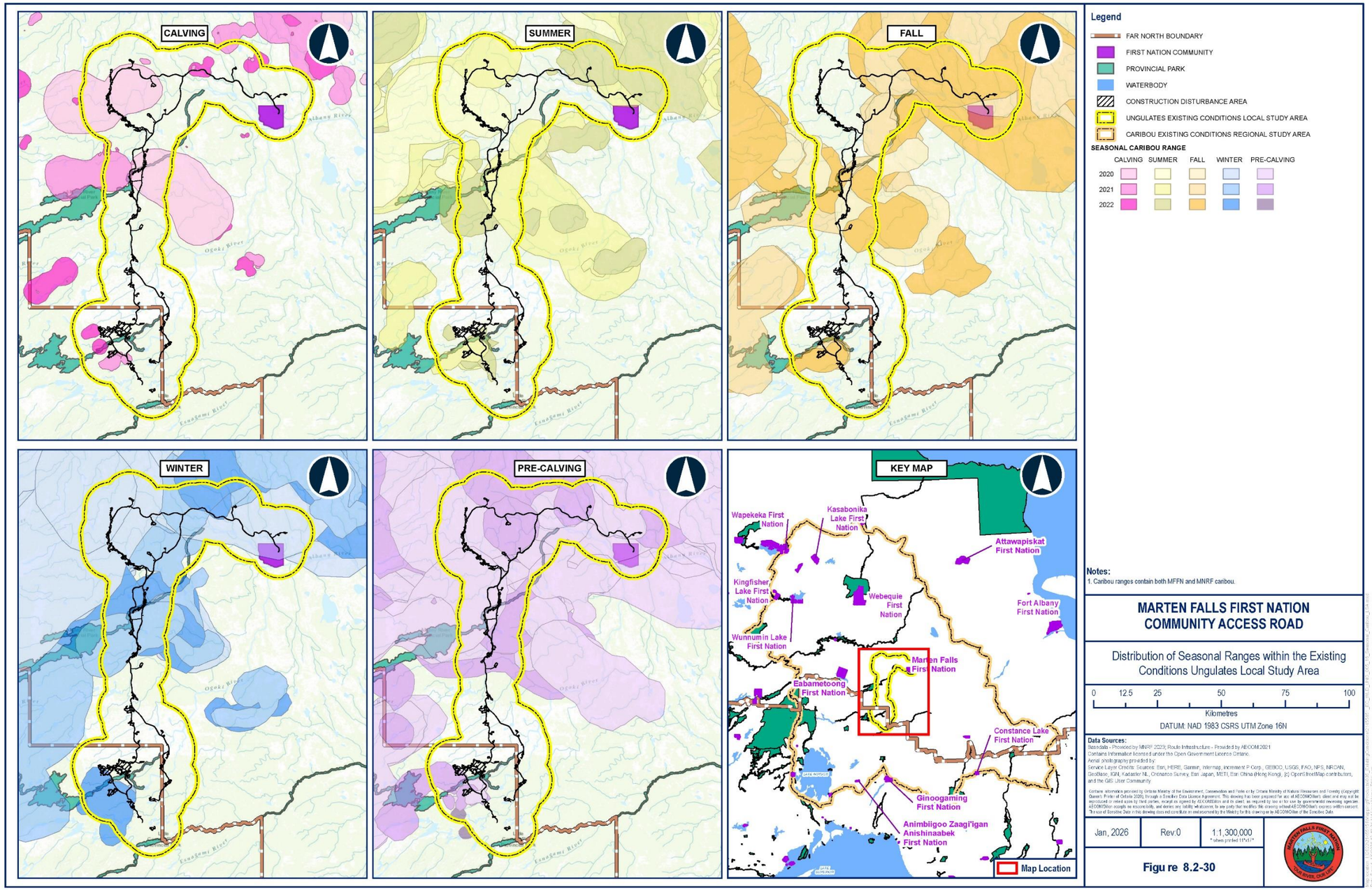


Table 8.2-29: Start and End Dates that Collared Caribou Travelled Within Pre-calving and Fall Travel Corridors

Movement Period	Ecotype	Count of Caribou-Years	Percent of Caribou-Years (percent) (Footnote a)	Travel Corridor Dates Median Start Date (Range)	Travel Corridor Dates Median End Date (Range)	Mean Duration (days) (plus or minus Standard Error)	Mean Distance Travelled (kilometres) (plus or minus Standard Error)
Pre-calving	Boreal	49	29	April 18 (March 8 to June 7)	May 3 (March 22 to June 16)	16 (plus or minus 2)	84 (plus or minus 13)
	Eastern migratory	36	95	23 March 23 (February 2 to May 19)	May 14 (May 1 to May 30)	44 (plus or minus 7)	500 (plus or minus 21)
Fall	Boreal	13	6	October 31 (September 3 to November 26)	November 12 (September 9 to December 24)	15 (plus or minus 3)	79 (plus or minus 29)
	Eastern migratory	21	40	October 11 (September 5 to November 18)	November 17 (September 19 to February 17)	52 (plus or minus 8)	336 (plus or minus 43)

Footnotes: (a) Percentages of collared boreal caribou-years were calculated from a total of 168 and 207 boreal caribou-years during the pre-calving and fall seasons, respectively. Percentages of eastern migratory caribou-years were calculated from a total of 38 and 53 eastern migratory caribou-years during the pre-calving and fall seasons, respectively.

8.2.7.1.3 Survival and Reproduction

Recent monitoring of caribou collared for the Community Access Road in the ungulate existing conditions Local Study Area found that annual survival rates for adult females in 2021 and 2022 was 90 percent and 81 percent, respectively; on average, this aligns with the estimated 85 percent adult survival rate that is necessary for a stable to increasing population (Environment Canada, 2011).

Caribou collared in February 2021 had blood samples collected to determine pregnancy status at the time of capture. Of 30 animals, 83 percent were pregnant, which is similar to other reported estimates of pregnancy rates in Ontario caribou populations (82 to 100 percent; Berglund et al., 2014).

Winter aerial surveys in 2022 and 2023 estimated that there are about 33.5 calves for every 100 adult female caribou, with a confidence range of 25.0 to 42.1 calves in the ungulate existing conditions Local Study Area. To estimate recruitment, they calculated the number of females from groups where more than 50 percent of caribou could be identified by age and sex. They found that 22.8 percent of the caribou observed were calves. The population overlapping the ungulate existing conditions Local Study Area in 2022 and 2023 appears to be at least stable and possibly increasing.

Wolves are the main threat to caribou, but black bears and occasionally polar bears also hunt them.

Hunting can affect caribou populations (Jalkotzy et al., 1997; Rettie et al., 1998); however, there is expected to be limited risk of human-caused mortality to caribou from hunting in the Project study areas under existing conditions because recreational hunting of caribou has not been permitted in Ontario since 1929 (Ontario Woodland Caribou Recovery Team, 2008). Boreal caribou was identified as a culturally important species that was hunted traditionally for their meat and hides. Boreal caribou is reported to still be occasionally harvested by some Indigenous Group members depending on their availability (SNC-Lavalin, 2020). Indigenous Knowledge provided by Marten Falls First Nation has noted that although caribou was historically hunted and is still hunted by Marten Falls First Nation members, it is not hunted to the same extent as moose due to declines in caribou population numbers in recent years. Marten Falls First Nation also noted that caribou holds an important cultural significance to the community; and therefore, is not harvested as readily as moose (Marten Falls First Nation, 2023b). However, there is no mandatory or voluntary reporting for Indigenous harvest, so harvest estimates and impacts from Indigenous hunting are difficult to determine.

Annual adult survival rates for adult females collared for the Project was estimated between 2021 and 2024. To avoid overestimations, only years with complete data were used. Across all years, the adult female annual survival estimate averaged 83 percent. Survival estimates were highest for 2021 (90 percent) and 2024 (100 percent). Estimates were lower for 2022 (81 percent) and 2023 (80 percent). These values are near the national average (85 percent; Environment and Climate Change Canada, 2024), and within the range of values expected for this region (**Table 8.2-30**).

Table 8.2-30: Annual Adult Survival of Caribou Collared for the Project, 2020 to 2025

Year	Number of Collared Adult Female Caribou (n) (Footnote a)	Number of Mortalities (d)	Adult Female Survival Estimate (S)	Lower 95 Percent Confidence Interval	Upper 95 Percent Confidence Interval
2021	30	3	90%	73%	98%
2022	26	5	81%	61%	93%
2023	20	4	80%	56%	94%
2024	14	0	100%	76%	100%
Combined (Footnote b)	30	12	60%	41%	77%

Footnotes: (a) Collar data received from Ministry of Natural Resources, Webequie Supply Project and Northern Road Link project did not include information about mortalities or collar failures; as such, only the animals collared for this Project are included in this summary.

(b) Combined row represents cumulative 5-year survival of the initial 30 collared adults. Average 1-year survival rate is 83 percent.

Aerial recruitment and winter distribution surveys were flown in 2022 and 2023 for the Project. The objectives were to determine survival of calves of collared caribou, gather population and distribution data about caribou in the Ungulate Local Study Area, and observe individuals and sign of moose, wolves and other wildlife. A minimum animal count of 185 and 457 caribou were observed in 2022 and 2023, respectively. In 2022, 48 calves were observed (26 percent of all caribou), and in 2023, 77 calves were observed (16 percent of all caribou). An annual sex ratio of 0.85 and 0.81 was calculated; however, as previously noted in Berglund et al. (2014), sex ratios from surveys primarily relocating collared adult females are likely biased because all groups contain at least one adult female. Annual recruitment estimates were 52.3 and 30.1 calves: 100 adult females, adjusted in 2022 and 2023, respectively, which was similar to values shared by the Ministry of Environment, Conservation and Parks for their surveys in Missisa and Ozhiski ranges between 2020 and 2023 (**Table 8.2-31**).

Table 8.2-31: Annual Recruitment Estimates from Aerial Recruitment and Distribution Surveys, 2022 to 2023

Year	Unknown Adults	Adult Males	Adult Females (Footnote a)	Calves	Unknown (Footnote b)	Total Adults	Total Caribou	Sex Ratio (Footnote c)	Adjusted Adult Females (AF_{adj}) (Footnote d)	Calves: 100 AF_{adj}
2022	68	6	34	48	30	108	185	0.85	92	52.3
2023	82	44	184	77	56	310	475	0.81	250	30.1

Footnotes: (a) Number of adult females observed during aerial recruitment surveys include females captured and collared in 2021 for the Project.
(b) Not classified to age or sex.
(c) Sex ratio is calculated as the number of adult females / (number of adult males plus number of adult females)
(d) Adjusted number of adult females (AFadj) calculated as (sex ratio x unknown adults) plus adult females.

Climate change poses a threat to caribou by affecting their habitat through more wildfires, deeper snow, and changes in food supply. Deer also move north, spreading diseases. Wetlands, which are crucial for caribou, are very sensitive to climate change, which could reduce suitable habitats for them.

8.2.7.2 Moose

Moose occur across Canada in a wide variety of habitats and is an important harvest animal for Indigenous communities. Moose are not at risk and not federally or provincially listed (Ontario Ministry of Natural Resources, 2025, Government of Canada, 2025a). Moose are managed in Ontario within Cervid Ecological Zones and at the scale of wildlife management units.

Field surveys used planes and helicopters to track moose. In 2022, 33 moose were seen, and in 2023, 47 moose were seen, mostly in upland forests. Moose tracks were common in the central and southern parts of the ungulate existing conditions Local Study Area. Other field programs from 2021 to 2023 spotted 45 moose, along with many tracks and signs of feeding. Information and analyses presented below summarize the data that were available at the time that the analyses for the Draft Environmental Assessment / Impact Statement and route selection were conducted (2019 to 2023).

8.2.7.2.1 Habitat Availability

Understanding moose habitat availability helps us know both the quality and amount of habitat they have, and how these change over time. Moose habitat is affected by natural features, wildfires, and human activities. Habitat availability was described using habitat

associations, suitability, and use, which are estimated with data models. Winter habitat suitability index model was used to inform winter moose habitat availability.

During field studies in the ungulate existing conditions Local Study Area, moose were detected in a variety of habitat types but were most commonly observed in deciduous forest habitat with remote cameras and during aerial surveys.

In the ungulate existing conditions Local Study Area, the habitats expected to be highly suitable for moose are forested areas, especially those with trees and swamps aged between 5 and 40 years. Good, moderate, and low-quality habitats make up 89 percent of the Local Study Area and 81 percent of the Regional Study Area. The remaining 11 percent of the Local Study Area and 19 percent of the Regional Study Area are considered poor habitats for moose (**Table 8.2-32**, **Figure 8.2-31**).

Table 8.2-32: Moose Winter Habitat Suitability in the Ungulate Local Study Area and Moose Regional Study Area

Winter Habitat Suitability	Ungulate Local Study Area (hectare)	Ungulate Local Study Area (percent)	Moose Regional Study Area (hectare)	Moose Regional Study Area (percent)
High	58,723	10	846,276	5
Moderate	436,597	71	10,010,157	62
Low	50,724	8	2,267,851	14
Poor	67,752	11	3,013,629	19
No Data (Footnote a)	Not applicable	Not applicable	1,134	Less than 0.1
Total	**613,796**	**100**	**16,139,047**	**100**

Footnotes: Totals may vary slightly due to rounding.

(a) Spatial landcover data were not available for some pixels located on the boundary of the Moose Regional Study Area (totalling 1,133.6 hectare), and therefore a habitat suitability index could not be assigned to these pixels.

Although top data models and habitat factors varied between years, the winter use patterns of the ungulate existing conditions Local Study Area by moose were generally consistent. Higher moose occupancy was predicted in the southern part of the ungulate existing conditions Local Study Area (**Figure 8.2-32**), which has upland forested habitats. Moose occupancy was lower in the northeastern part of the ungulate existing conditions Local Study Area, which is mostly peatlands (**Figure 8.2-32**). These results match previous studies showing moose prefer mixed forests and avoid open bogs and fens Poley et al. (2014).

Figure 8.2-31: Winter Habitat Suitability for Moose in the Existing Conditions Ungulates Local Study Area and Moose Existing Conditions Regional Study Area

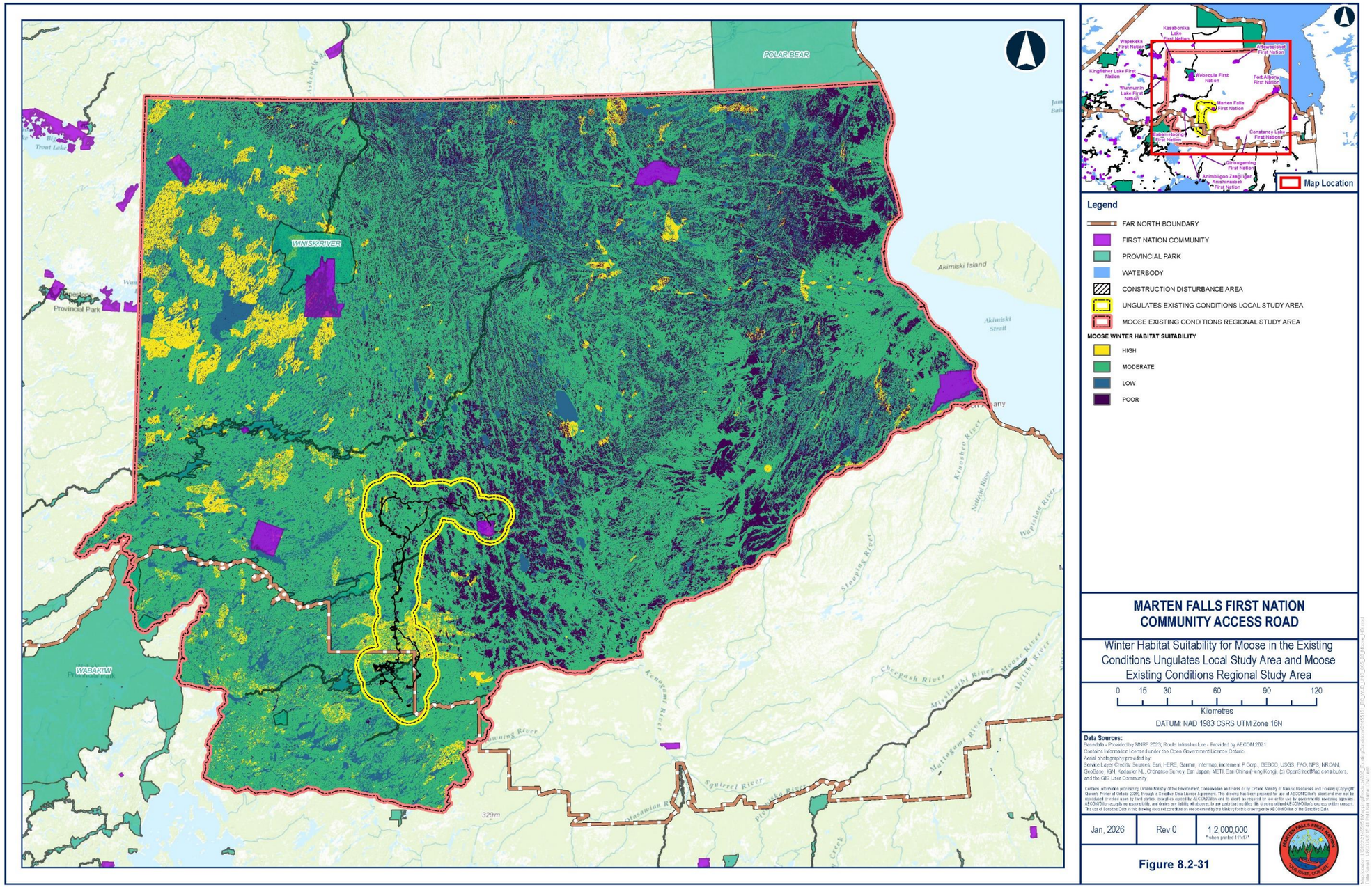
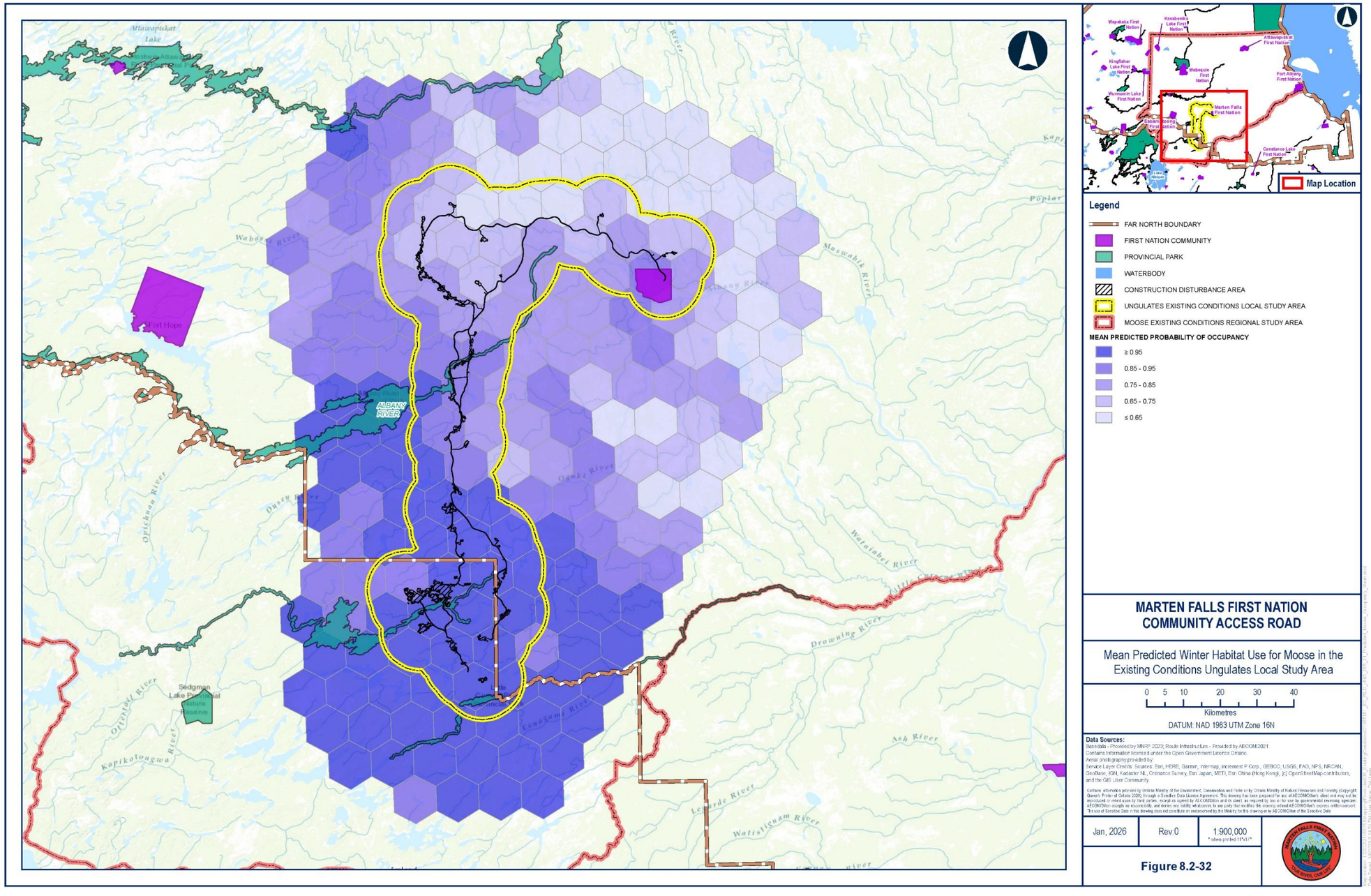


Figure 8.2-32: Mean Predicted Winter Habitat Use for Moose in the Existing Conditions Ungulates Local Study Area



There are two provincial parks located within the ungulates effects assessment Local Study Area: Ogoki River Provincial Park and Albany River Provincial Park. In the moose effects assessment Regional Study Area, an additional five provincial parks and waterway parks occur: Winisk Provincial Park, Otoskwin-Attawapiskat River Provincial Park, Wabakimi Provincial Park, Little Current River Provincial Park, and Sedgman Lake Provincial Park. Protected area covers 8,327 hectares (2 percent) of the ungulate effects assessment Local Study Area and 327,652 hectares (2 percent) of the moose effects assessment Regional Study Area. There are no federally protected areas in the moose effects assessment Regional Study Area.

8.2.7.2.2 Habitat Distribution

The way habitats are spread out and connected affects where moose live and move. In the study areas, suitable habitats for moose are determined by how well different important seasonal areas are connected and how many linear features (like roads) there are, which can break up the habitat.

In the Local Study Area, good moose habitats are mostly found in the central part and are well-connected, but they are broken up in the southern part. In the moose Regional Study Area, good moose habitats are mainly in the western part and are also fragmented. However, in the southern part of the Regional Study Area, these habitats are more connected.

Significant wildlife habitats are areas crucial for wildlife and plants. For moose, important habitats include places where they feed on aquatic plants, mineral licks where they get essential minerals, and calving sites where they give birth. These feeding areas are usually found in shallow lakes, beaver ponds, and rivers. Mineral licks can be natural or man-made, like salt along roads.

In the southern part of the moose Regional Study Area, there are several important habitats for moose, including aquatic feeding areas, calving sites, and mineral licks. No such habitats have been recorded in the moose Local Study Area, but they likely exist and just have not been documented yet. Moose often return to the same calving sites, which can be found in various types of forests and open areas near water.

8.2.7.2.3 Survival and Reproduction

Moose survival and reproduction depend on suitable habitat. Moose populations are affected by habitat loss, hunting, predation, parasites, climate change and disease. There are concerns about declining moose populations in parts of North America, including Ontario. Moose are long-lived and have high survival rates, with cow moose

often giving birth to twins. Moose density varies with habitat quality, and in Ontario, they are managed as a big game species. Moose populations increased with changes in management practices but have declined recently. Indigenous communities have reported declines in local moose populations.

Wolves and black bears are their main predators. Increased deer populations and linear features like roads can increase predation risks. Moose can contract diseases like brainworm and suffer from parasites like winter ticks. Hunting by non-First Nation hunters is managed by the provincial government through a tag system, and moose are also hunted by many Indigenous hunters, but climate change poses additional risks, causing heat stress and affecting habitat. Moose are important to Indigenous cultures for food and materials, and their health is monitored for parasites and disease.

8.2.8 Physiography, Terrain, and Soils

This section provides a description of existing environmental conditions for physiography, soils and terrain. The existing physiography, soils and terrain conditions are described within the Construction Disturbance Area, Local Study Area, and Regional Study Area.

The current physiography, soil, and terrain conditions were studied using existing reports and maps, along with field surveys. These surveys were done in May and October 2022 by visually inspecting and examining the ground at selected sites. The sites were chosen based on initial assessments and maps and were accessed by helicopter and on foot when possible.

The complete description of physiography, soils and terrain existing conditions is documented in the Physiography, Terrain and Soils Technical Support Document (**Appendix N**).

8.2.8.1 Regional Physiography

Physiography describes the Earth's surface features and how they formed (Bates and Jackson, 1987). Most of the Community Access Road Regional Study Area is in the Severn Upland, with the far northeast part in the Hudson Bay Lowland. (Bostock, 1970). The Severn Upland is a part of the James Region and the Canadian Shield (Bostock, 1970).

Today the Severn Uplands have a rocky landscape with many lakes, and deposits from ancient glaciers (Thurston, 1991). These deposits include clay from glacial lakes, sediments from glacial rivers, and various glacial materials (Thurston, 1991). Over the

past 8,000 years, up to 4 metres of organic material has built up on the flat, poorly drained plains that were once covered by Glacial Lakes Agassiz and Ojibway (Dredge and Cowan, 1989). The Hudson Bay Lowland is a low, swampy area with many bogs and shallow lakes (Thurston, 1991).

8.2.8.2 Regional Bedrock Geology

Bedrock geology in the Regional Study Area is made up of two groups of rocks. The first group, which is the largest, includes very old volcanic rocks (2.5 to 3.2 billion years old) and some sedimentary rocks (Ontario Geological Survey, 2011). The second group is much younger, consisting of sedimentary rocks (444 to 488 million years old) like shale, limestone, dolostone, and siltstone (Ontario Geological Survey, 2011). These younger rocks are found about 25 kilometres from the Community.

The most common ancient volcanic rocks in the Regional Study Area are made of felsic intrusions belonging to the suite of foliated to massive rocks composed of tonalite to granodiorite and are found mainly in the central part. In the southern part, there are metasedimentary rocks like paragneiss and migmatites. In the northern part, there are volcanic rocks like basalt and andesite, along with tuffs, breccias, and related migmatites (Ontario Geological Survey, 2011).

There are many northwest-trending mafic dykes in the Regional Study Area that are about 2.45 billion years old. These dykes are a bit younger than the older metavolcanic rocks and cut across them.

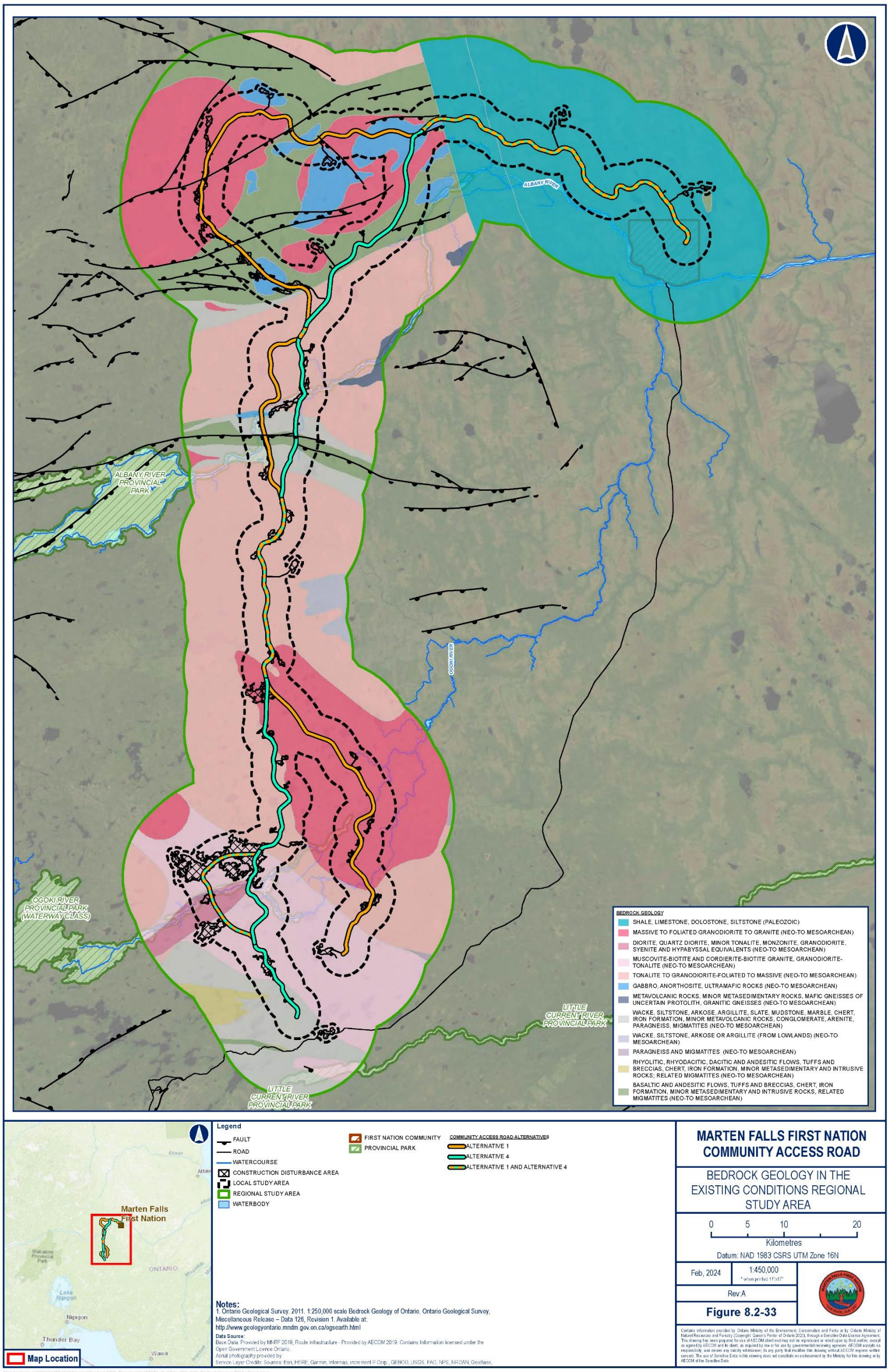
Figure 8.2-33 shows the bedrock geology within the Regional Study Area.

8.2.8.3 Regional Surficial Geology

Surficial geology mapping for Northern Ontario was done at a 1 to 1,000,000 scale by Barnett et al. (1991). This mapping was included in the seamless coverage of quaternary geology for Ontario (Ontario Geological Survey, 1997). Four predictive surficial geology maps cover the Marten Falls Regional Study Area (Barnett et al., 2013a, 2013b, 2013c; Gao and Yeung, 2018) and were reviewed during the preliminary terrain mapping of the Local Study Area.

The southern part of the Regional Study Area, including sections of Alternative 1 and Alternative 4 between Percy Lake and Winslow Lake, is mostly covered with till. The main type of till here is a mix of sandy silt to silt with moderate to high amounts of rocks and varying levels of carbonate. In the eastern part, the till has a clayey silt to clay mix with fewer rocks and moderate to high carbonate content.

Figure 8.2-33: Bedrock Geology in the Existing Conditions Regional Study Area



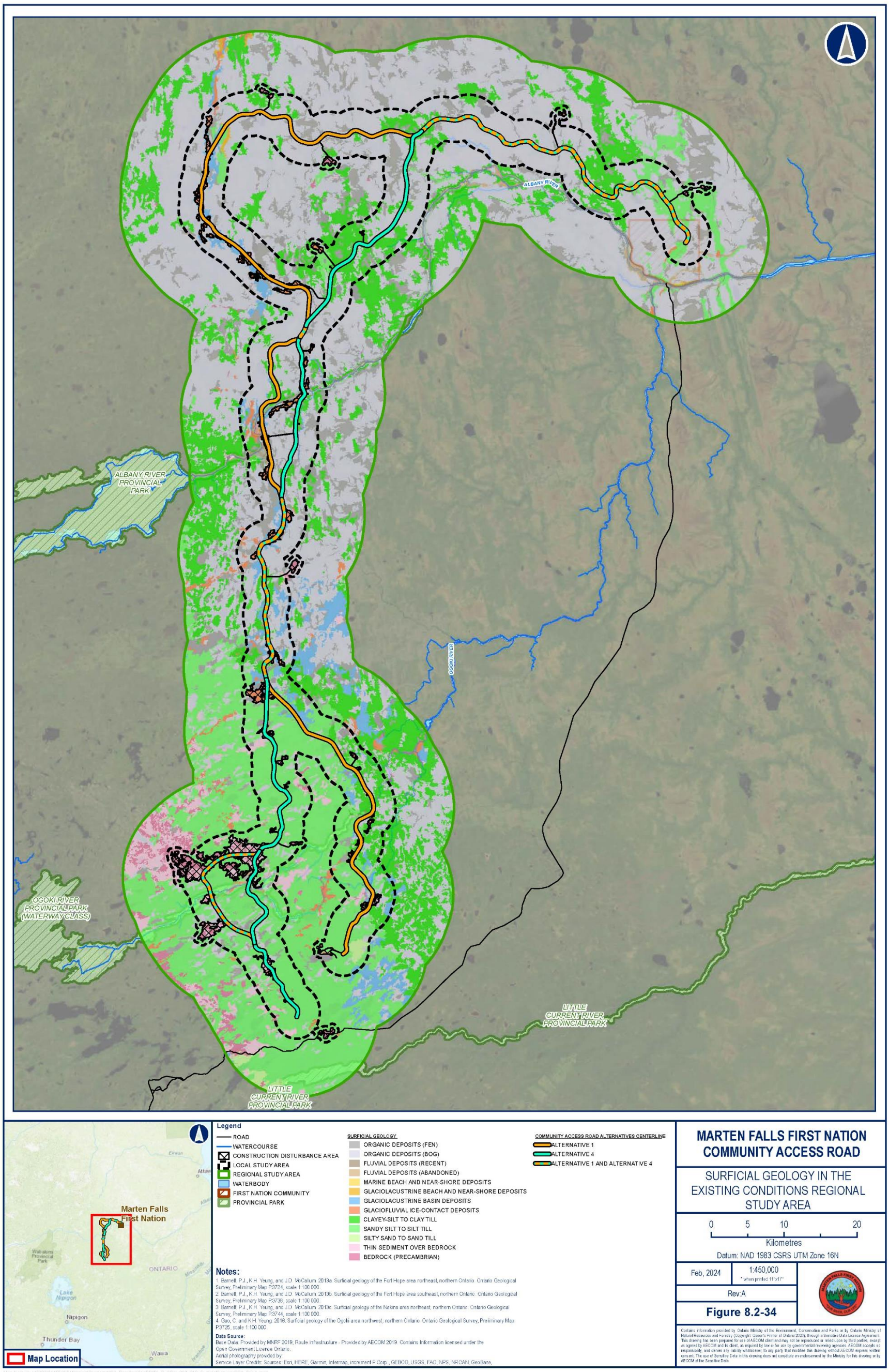
In the southern part of the Regional Study Area, there are drumlins, which are ridges or hills formed by glaciers. There are also many bedrock outcrops west of Alternative 4, with thin layers of till nearby. East of Alternative 1, there are pockets of fine sediments like silt, clay, and some sand. Small areas of sand and gravel deposits from glacial rivers are scattered throughout the southern area. More recent sediments include sand and gravel from rivers and organic material like bogs and fens. These organic materials are found in pockets throughout the southern area, with larger areas east of Alternative 1, south of Dusey Lake.

The rest of the Regional Study Area, from Winslow Lake north, is mostly made up of organic material like bogs and fens. There are also scattered areas of till, which are made of clayey silt to clay with some rocks.

Fluvial sediments, which are deposits from rivers and streams, have been mapped next to these waterbodies throughout the area. Eskers, which are winding ridges made of sand and gravel formed by meltwater flowing through or under glacier ice (Howes and Kenk, 1997), have been mapped in areas with glaciofluvial sediments.

The surficial geology within the Regional Study Area is shown on **Figure 8.2-34**.

Figure 8.2-34: Surficial Geology in the Existing Conditions Regional Study Area



8.2.8.4 Terrain

8.2.8.4.1 Surficial Materials

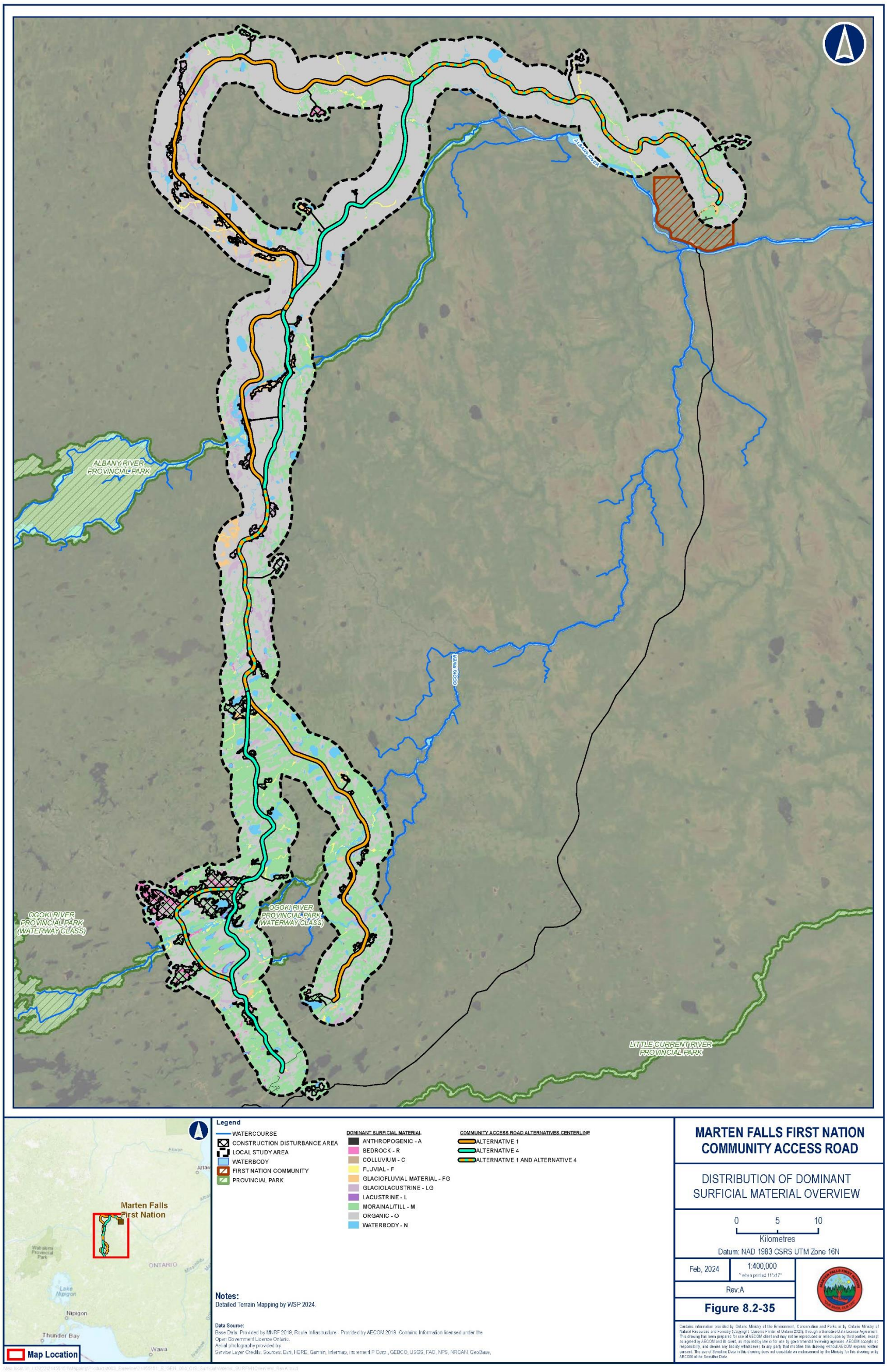
The desktop review and field assessments found 11 types of surficial materials in the Local Study Area and Construction Disturbance Area. These materials are listed in **Table 8.2-33** with their areas and percentages. **Figure 8.2-35** shows an overview of the mapping results. In the Construction Disturbance Area, about 32.6 percent of the terrain is till, 35.9 percent is organic soils, 15.0 percent is glaciolacustrine sediments, and both glaciofluvial sediments and bedrock each make up about 7.6 percent.

Table 8.2-33: Surficial Materials in the Local Study Area and Construction Disturbance Area

Surficial Material	Local Study Area (hectare)	Local Study Area (percent)	Construction Disturbance Area (hectare)	Construction Disturbance Area (percent)
Anthropogenic (A)	64.2	Less than 0.1	1.9	Less than 0.1
Colluvium (C)	71.7	Less than 0.1	5.9	Less than 0.1
Weathered Bedrock (D)	2.5	Less than 0.1	-	-
Fluvial (F)	2,237.2	1.1	102.5	0.8
Glaciofluvial (FG)	2,446.6	1.2	961.6	7.6
Lacustrine (L)	302.8	0.2	9.1	0.1
Glaciolacustrine (LG)	8,224.9	4.2	1,886.1	14.9
Moraine (till) (M)	57,352.1	29.0	4,132.0	32.6
Open Water (N)	8,757.6	4.4	55.5	0.4
Organic (O)	116,624.8	58.9	4,544.8	35.9
Bedrock (R)	1,875.5	0.9	965.8	7.6
Total	**197,959.8**	**100.0**	**12,665.3**	**100.0**

Footnotes: Totals may vary slightly due to rounding.

Figure 8.2-35: Distribution of Dominant Surficial Material Overview



8.2.8.4.2 Drainage

Drainage in the Construction Disturbance Area and Local Study Area varies from very poorly drained organic soils to very rapidly drained bedrock outcrops. About 61.6 percent of the Local Study Area is very poorly drained, and another 11.4 percent is poorly or imperfectly drained. Around 23.4 percent is well drained. In the Construction Disturbance Area, 38.0 percent is very poorly drained, 10.0 percent is poorly or imperfectly drained, and 51.7 percent is well drained.

Table 8.2-34 summarizes the drainage mapped in the Local Study Area and Construction Disturbance Area and the dominant drainage in each terrain is shown on **Figure 8.2-36**.

Table 8.2-34: Drainage in the Local Study Area and Construction Disturbance Area

Drainage	Local Study Area (hectare)	Local Study Area (percent)	Construction Disturbance Area (hectare)	Construction Disturbance Area (percent)
Very Rapid (X)	1,497.2	0.8	1,075.9	8.5
Rapid (R)	1,673.3	0.8	829.2	6.5
Well (W)	24,150.1	12.2	3,086.8	24.4
Moderately Well (M)	18,912.6	9.6	1,552.2	12.3
Imperfect (I)	12,826.5	6.5	851.8	6.7
Poor (P)	9,721.5	4.9	420.0	3.3
Very Poor (V)	122,007.5	61.6	4,808.3	38.0
Null (open water or anthropogenic)	7,171.1	3.6	41.1	0.3
Total	**197,959.8**	**100.0**	**12,665.3**	**100.0**

Footnotes: Totals may vary slightly due to rounding.

Figure 8.2-36: Soil Drainage Within the Marten Falls Community Access Road Existing Conditions Local Study Area and Construction Disturbance Area

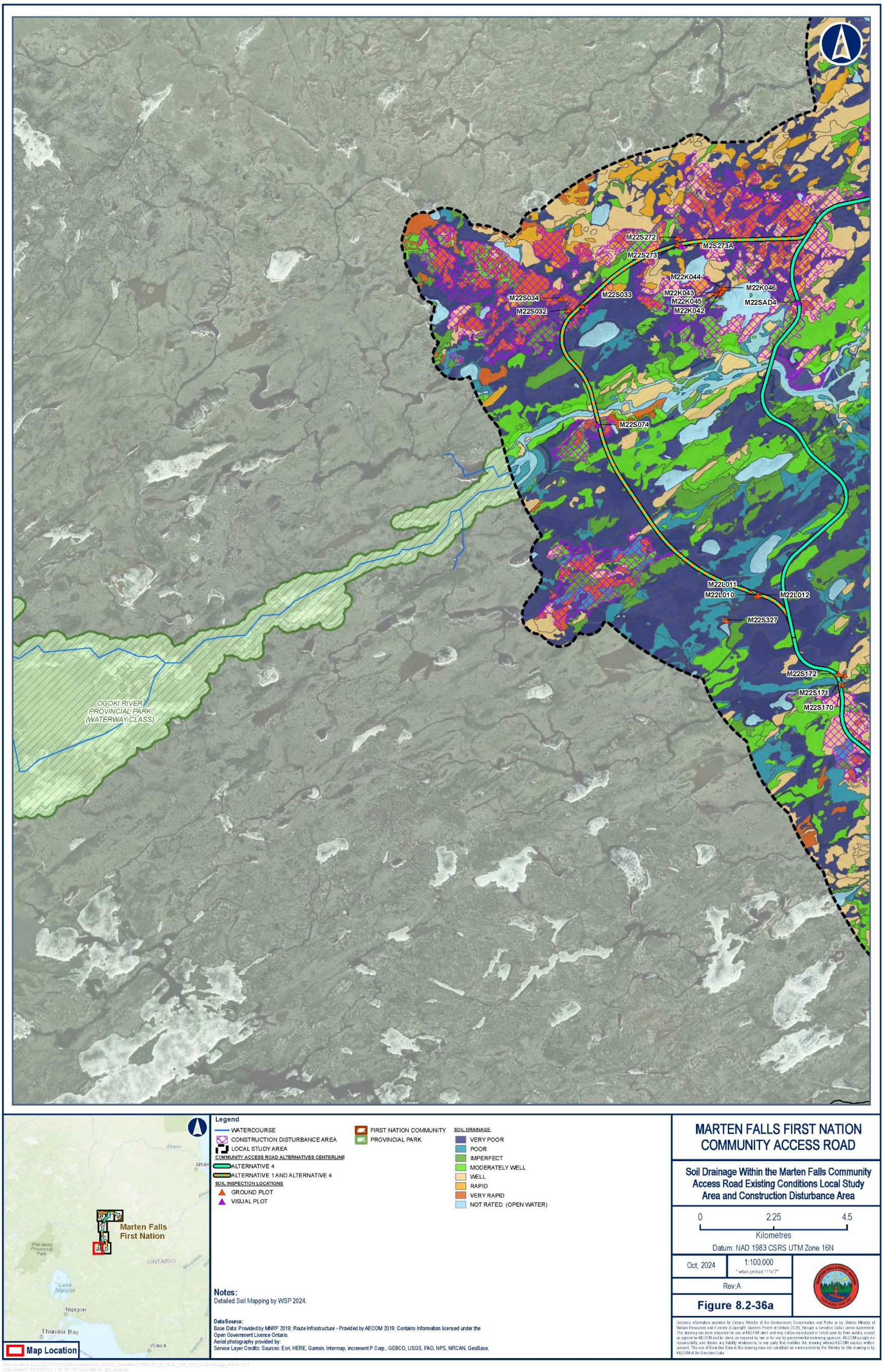


Figure 8.2-36b: Soil Drainage Within the Marten Falls Community Access Road Existing Conditions Local Study Area and Construction Disturbance Area

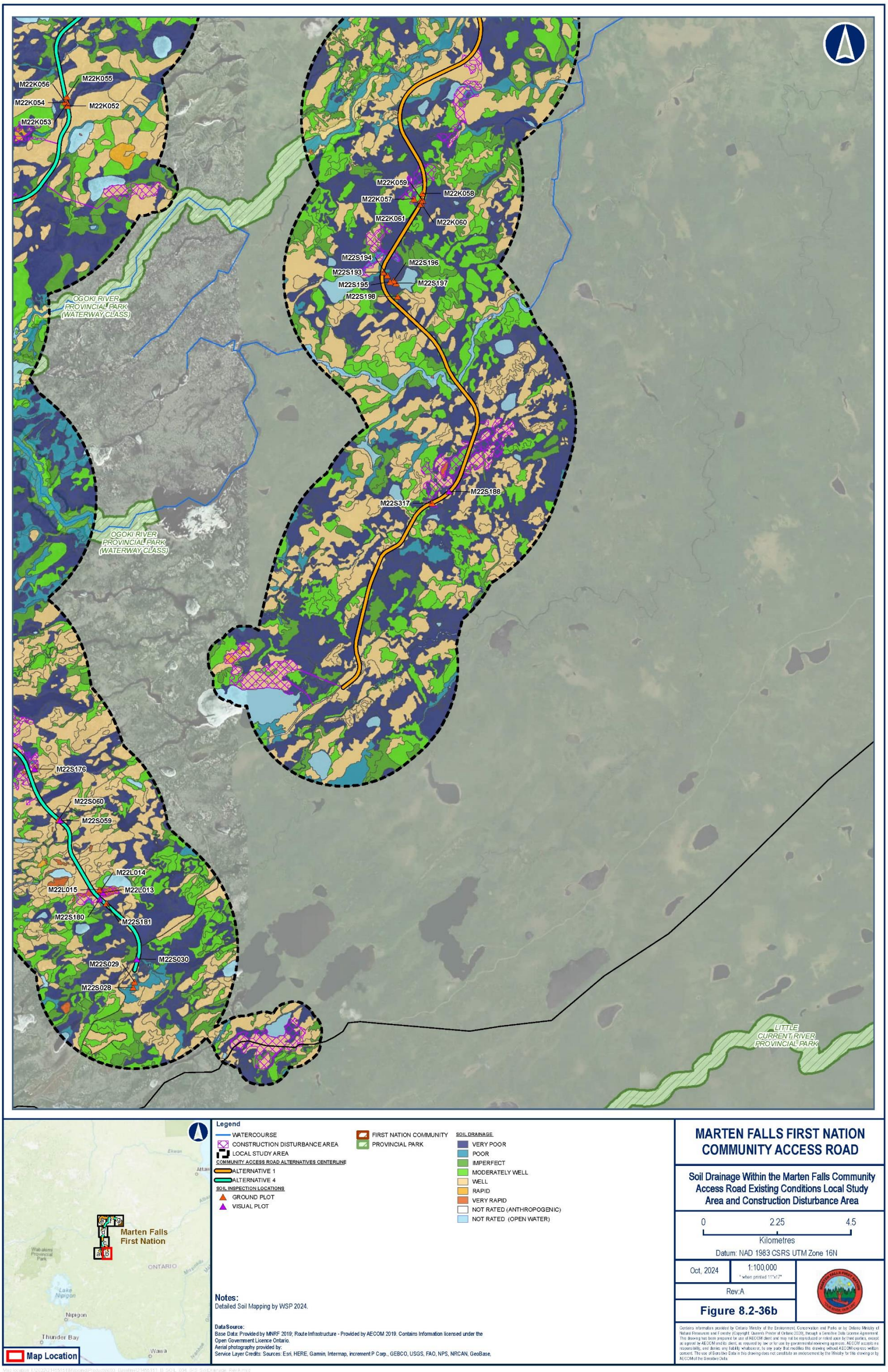


Figure 8.2-36c: Soil Drainage Within the Marten Falls Community Access Road Existing Conditions Local Study Area and Construction Disturbance Area

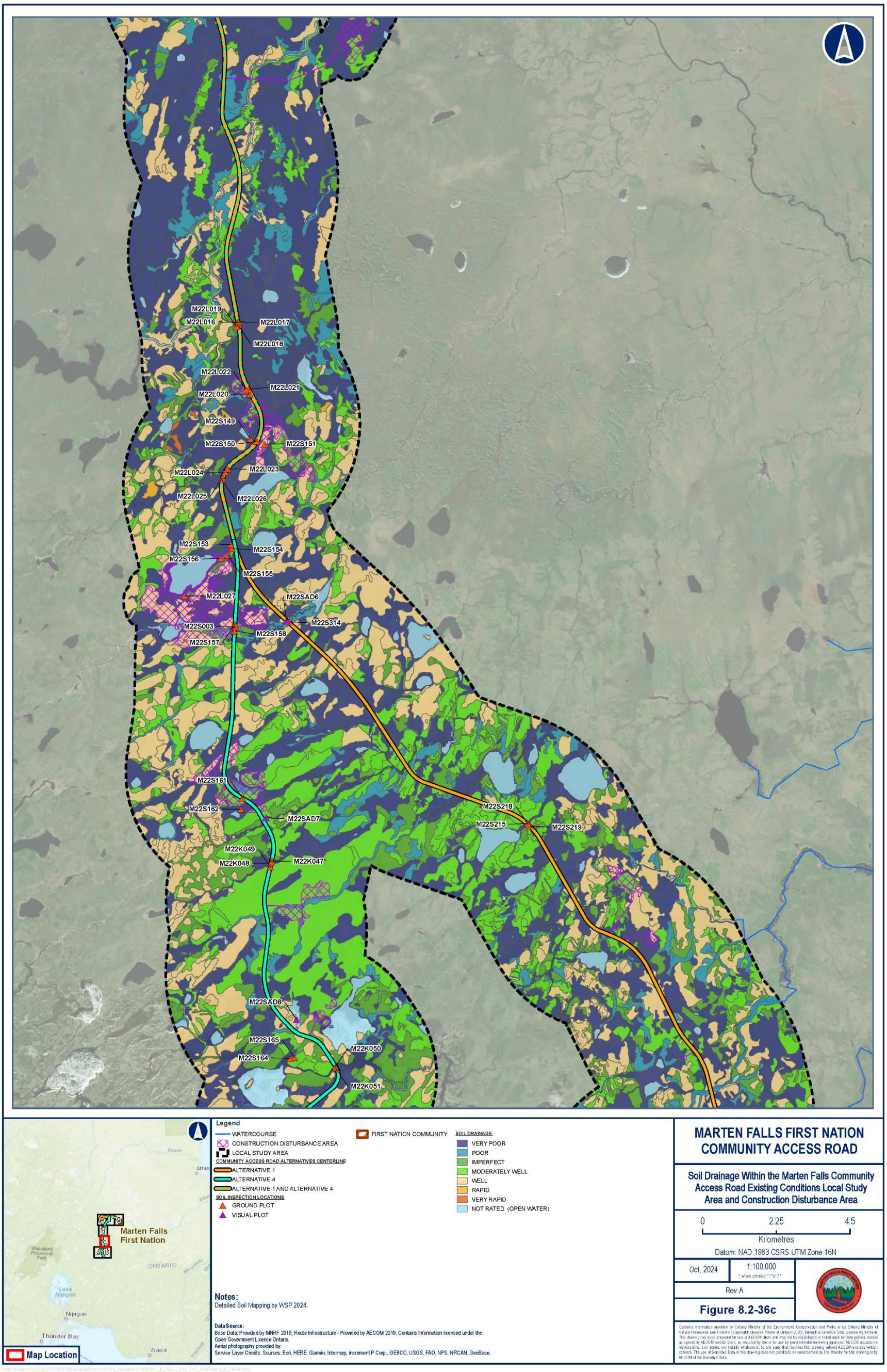


Figure 8.2-36d: Soil Drainage Within the Marten Falls Community Access Road Existing Conditions Local Study Area and Construction Disturbance Area

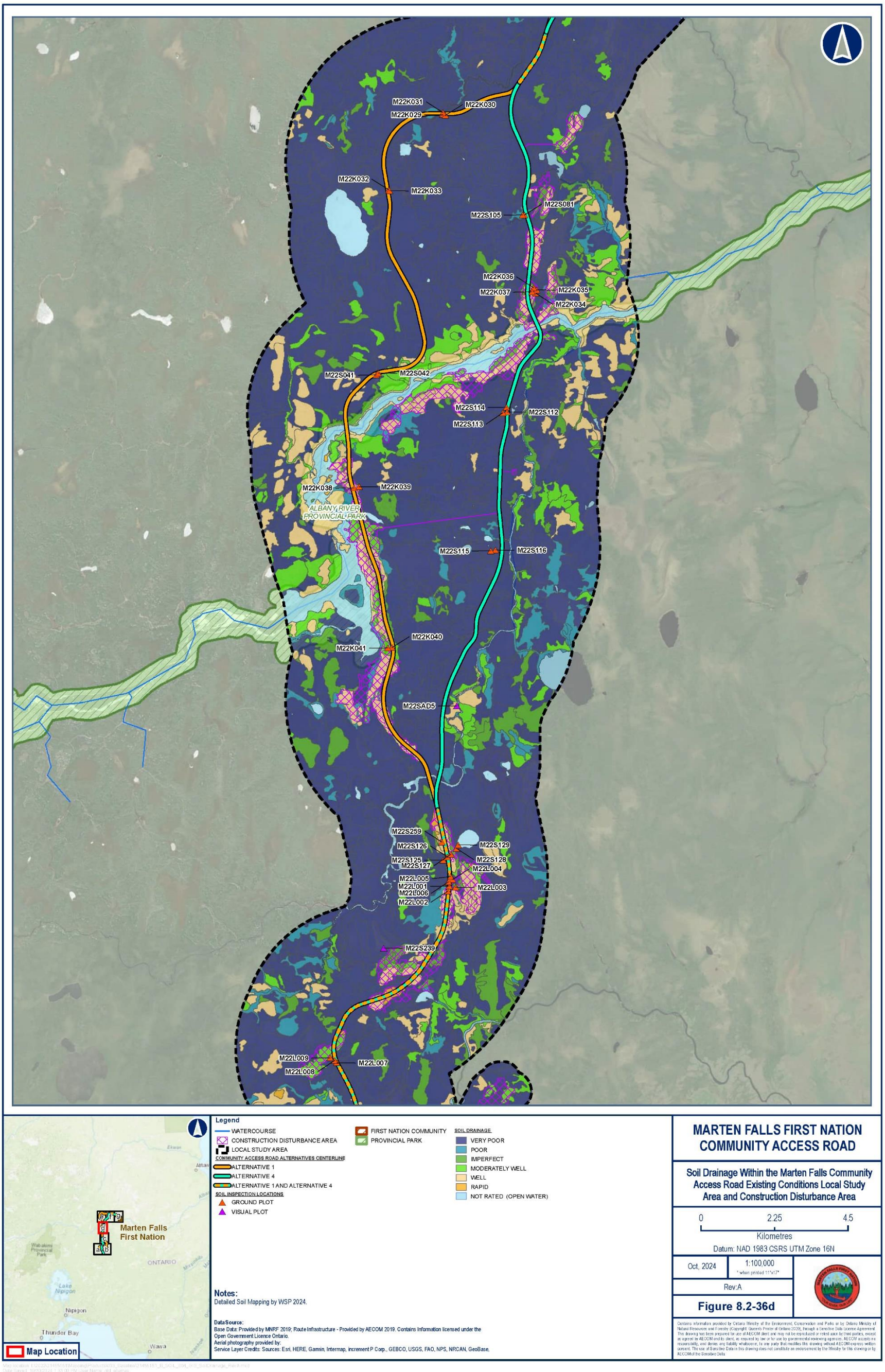


Figure 8.2-36e: Soil Drainage Within the Marten Falls Community Access Road Existing Conditions Local Study Area and Construction Disturbance Area

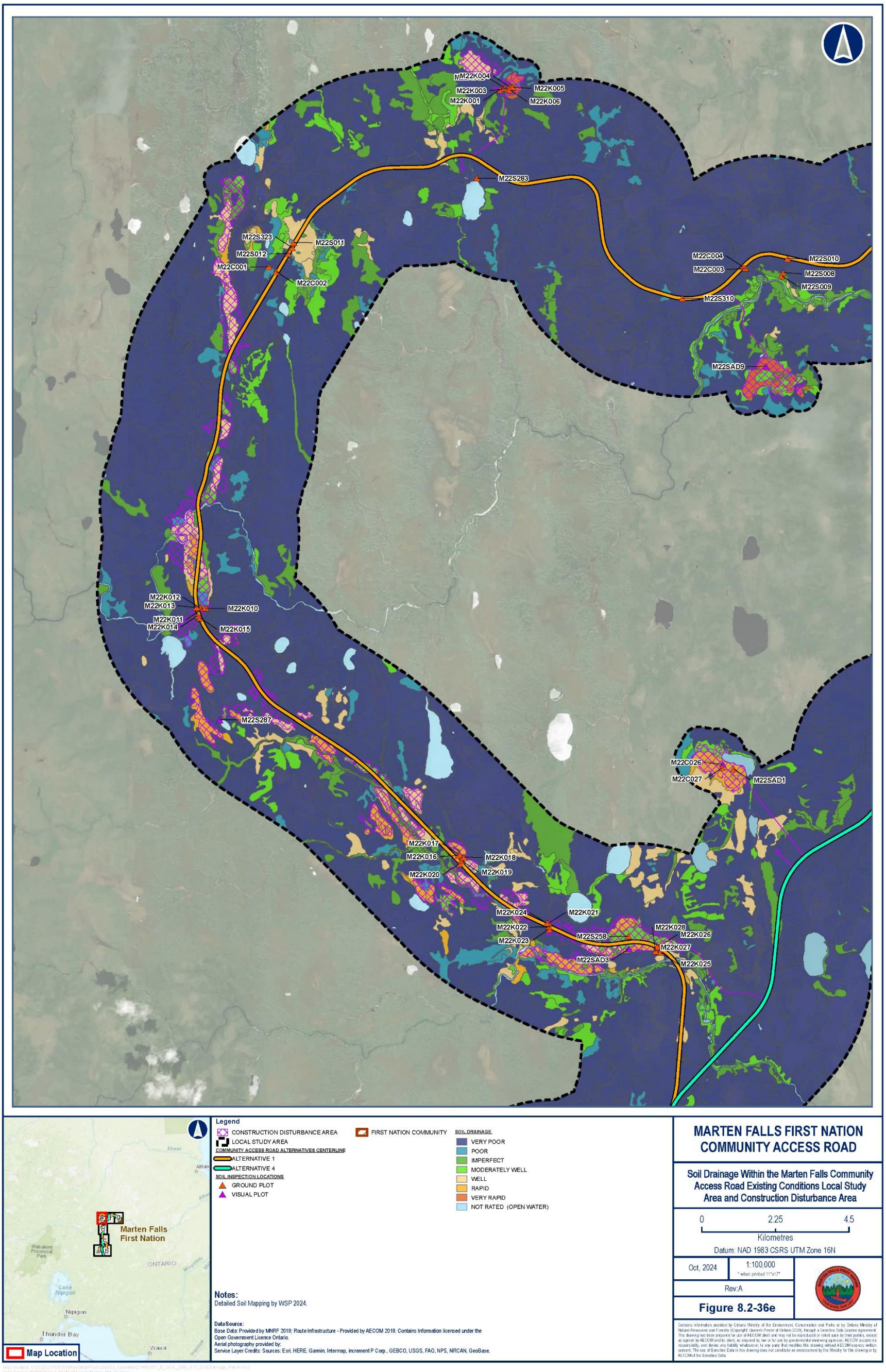


Figure 8.2-36f: Soil Drainage Within the Marten Falls Community Access Road Existing Conditions Local Study Area and Construction Disturbance Area

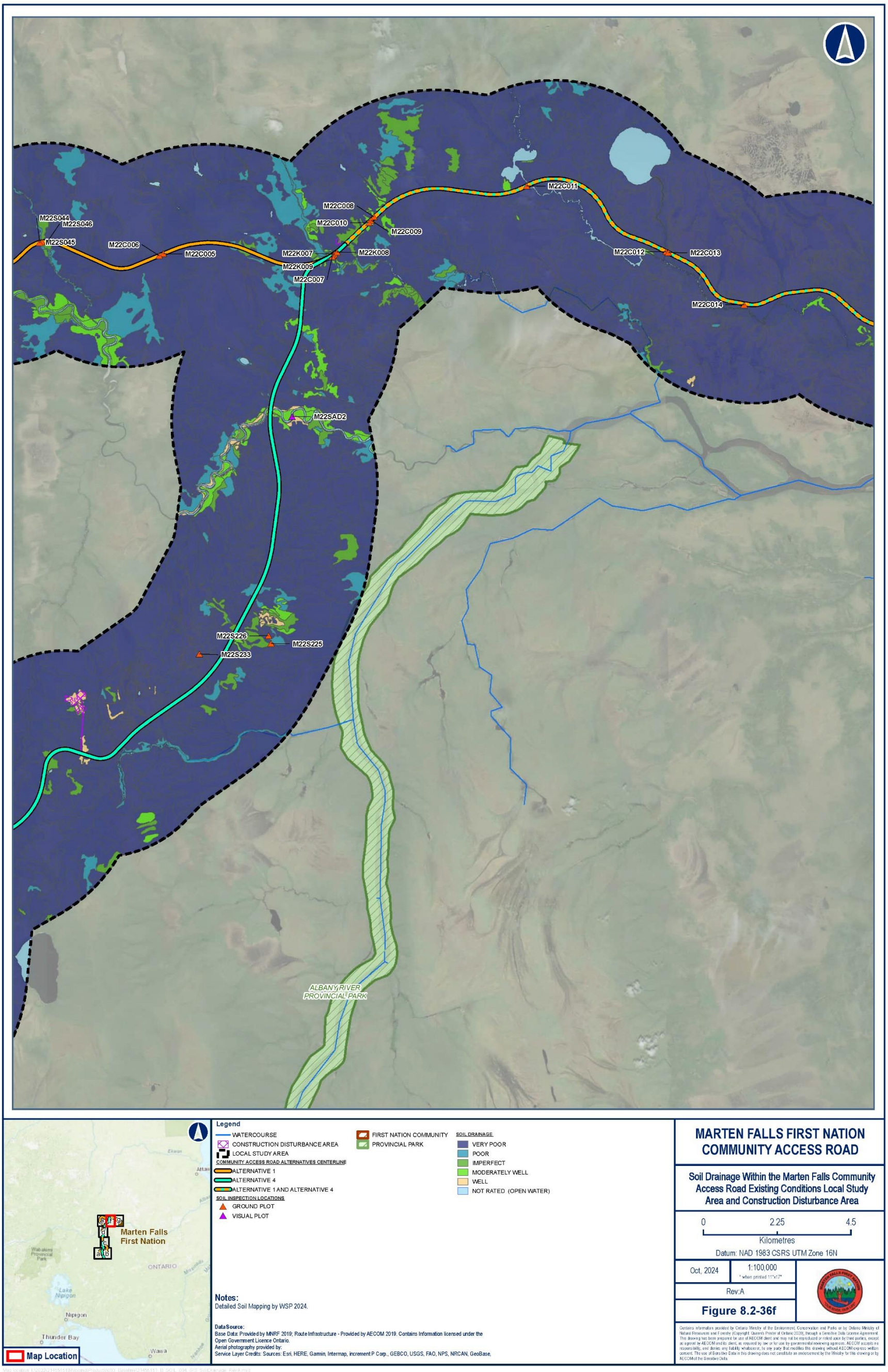
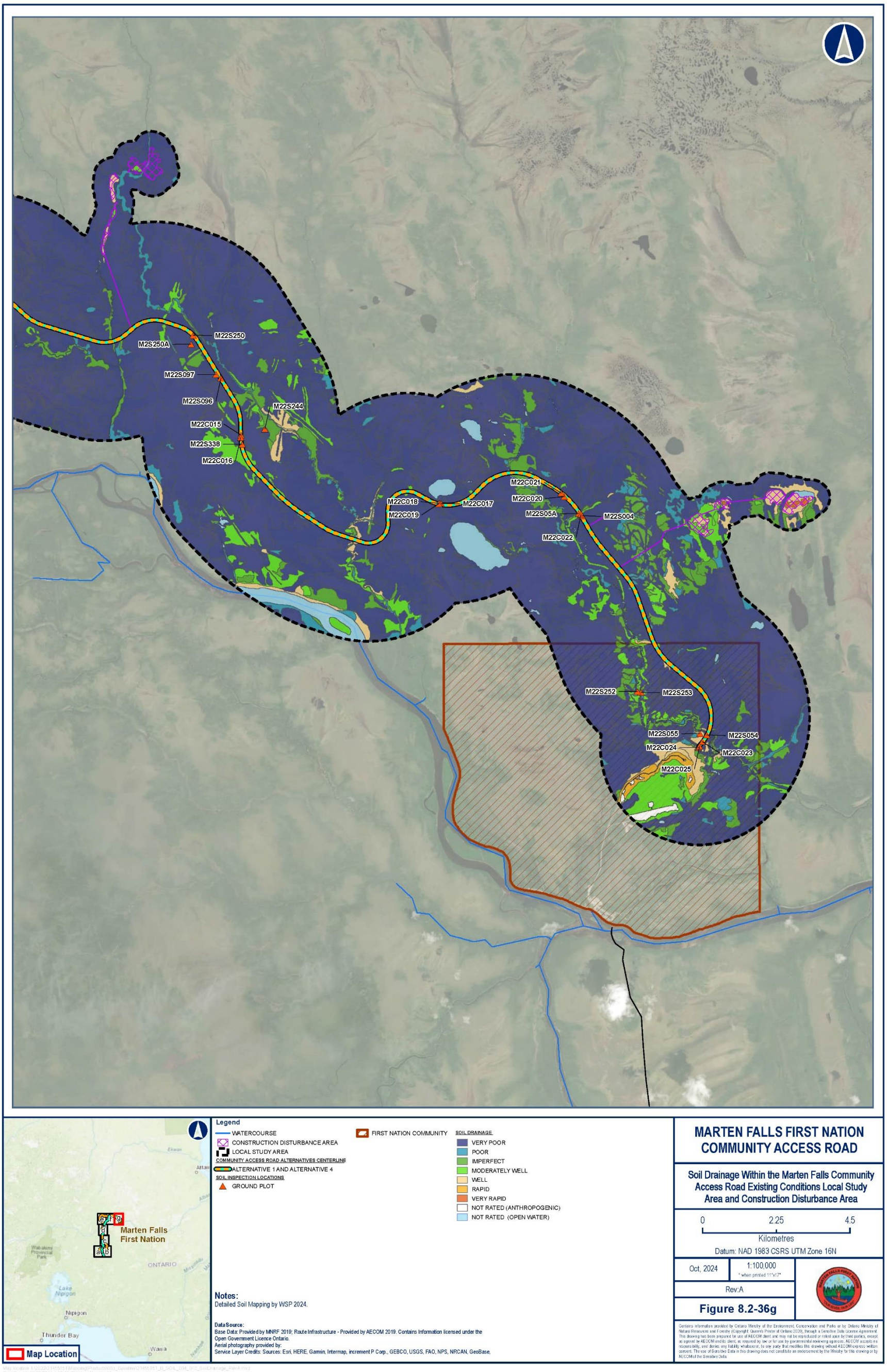


Figure 8.2-36g: Soil Drainage Within the Marten Falls Community Access Road Existing Conditions Local Study Area and Construction Disturbance Area



8.2.8.4.3 Terrain Stability

The terrain in the Local Study Area and Construction Disturbance Area is mostly stable, so landslides are unlikely after vegetation removal or construction. About 99.7 percent of the Construction Disturbance Area and 96.3 percent of the Local Study Area are considered stable, with a very low chance of landslides after disturbance.

Potentially unstable terrain with a moderate chance of landslides, and unstable terrain (Class V) with a high chance of landslides, each make up less than 0.1 percent of the Local Study Area and the Construction Disturbance Area. Potentially unstable terrain includes areas with till, colluvium, or glaciofluvial deposits on steeper slopes that may show signs of slow, shallow failures, gullying, or seepage. These slopes range from 5 percent to 70 percent grade. Unstable terrain shows evidence of rapid mass movement and is mapped as colluvium. Field crews were able to check some of these areas in the field.

Table 8.2-35 lists each stability class and the associated area and proportion (percentage) of the Local Study Area and Construction Disturbance Area of each stability class.

Table 8.2-35: Terrain Stability Classes in the Local Study Area and Construction Disturbance Area

Terrain Stability Class (Footnote a)	Local Study Area (hectare)	Local Study Area (percent)	Construction Disturbance Area (hectare)	Construction Disturbance Area (percent)
Stable	179,385.0	90.6	10,645.7	84.1
Generally stable	10,519.0	5.3	1,795.5	14.2
Moderately stable	805.4	0.4	177.7	1.4
Potentially unstable	53.3	Less than 0.1	3.0	Less than 0.1
Unstable	26.0	Less than 0.1	2.3	Less than 0.1
Null (open water or anthropogenic)	7,171.1	3.6	41.1	0.3
Total	**197,959.8**	**100.0**	**12,665.3**	**100.0**

Footnotes: Totals may vary slightly due to rounding.

(a) Adapted from British Columbia Ministry of Forests and British Columbia Ministry of Environment (1999).

8.2.8.5 Geohazards

8.2.8.5.1 Seismic

Strong ground shaking from large earthquakes can damage infrastructure through ground movements or accelerations (O'Rourke and Liu, 1999, 2012). This hazard is measured by peak horizontal ground acceleration, expressed as a percentage of Earth's gravity. Earthquakes can also cause liquefaction, soil spreading, and landslides.

In the Regional Study Area, peak horizontal ground acceleration values are 0.01 g, which is below the threshold for light damage (0.09 to 0.18 g) (Kolaj et al., 2023; Wald et al., 1999). No active quaternary-aged faults were found in the area (Ontario Geological Survey, 2011).

No earthquakes have been recorded in the Regional Study Area based on several databases (Natural Resources Canada, 2021a; Halchuk et al., 2015; Lamontagne et al., 2018). The closest recorded earthquake was a magnitude 2.1 event on June 24, 2006, about 54.2 kilometres southeast of Marten Falls at a depth of 18 kilometres (Natural Resources Canada, 2021a). Earthquakes below magnitude 3.5 are usually recorded but not felt (Natural Resources Canada, 2021b).

8.2.8.5.2 Liquefaction

Liquefaction happens when loose, granular materials like sand and gravel turn into a liquid state due to increased water pressure during strong ground shaking (Youd et al., 2001). This can cause damage to infrastructure if the ground shakes enough to cause liquefaction and spreading.

In the Regional Study Area, there are areas of sand and gravel near rivers that can become saturated, especially during spring melt or heavy rain (Ontario Geological Survey, 2018). However, the risk of liquefaction here is very low because the ground shaking values are very low (0.01 grams) (Kolaj et al., 2023).

8.2.8.5.3 Landslides and Slumps

Landslides and slumps happen when slopes fail, causing debris to move downhill. This debris can be dry, moist, or saturated and comes from surface materials or bedrock (Howes and Kenk, 1997). Slope failure can be caused by riverbank erosion, human activities (like road cuts or mining), earthquakes, heavy rain, snowmelt, or changes in water levels or groundwater.

Small areas of landslides or slumps were found during detailed terrain mapping of the Local Study Area. These areas are defined as materials that moved due to gravity without any transportation agent like water or ice, although the moving material might have contained water or ice (Howes and Kenk, 1997).

Steep slopes have a minimum grade of 50 percent, which is a 2:1 ratio. Colluvium areas are included because they often have steep slopes, which can affect construction and maintenance. Many steep slopes are found where thin layers of till cover bedrock in the southern part of the Community Access Road (for example, near BR-02 and Colpitts Creek, Alternative 1). Other steep slopes are next to meandering rivers where the outer banks are eroded by the water.

8.2.8.5.4 Permafrost and Degradation

Permafrost is ground that stays at or below 0 degrees Celsius for long periods (Heginbottom et al., 1995). Thermokarst occurs when ice-rich permafrost thaws, causing ground depressions often filled with small lakes (Howes and Kenk, 1997).

The north end of the Regional Study Area is about 12 kilometres south of an area with isolated patches of permafrost (less than 10 percent of the land area) and low ground ice content (Heginbottom et al., 1995). Low-resolution soil mapping shows potential Cryosolic soils 2 to 3 kilometres west of the Regional Study Area in Albany Provincial Park (Natural Resources Canada, 2020). Predictive surficial geology mapping identified palsas, which are ice-rich peat mounds, in the northern part of the Regional Study Area (Ontario Geological Survey, 2018; Brown, 1968).

A helicopter survey found potential permafrost areas in the northern part of the Regional Study Area, such as near Oxtoby Lake (KGS Group, 2019a). Additionally, 12 test holes north of the Albany River showed temperatures below freezing, suggesting isolated patches of permafrost (KGS Group, 2019b).

One potential permafrost area within the Local Study Area was identified about 630 metres southwest of SG-16 (south of the Wabassi River shown on **Figure 8.2-37**), but this could not be confirmed through field checks. No frozen ground was found during field inspections in 2022.

8.2.8.5.5 Isostatic Rise

During the last glaciation, thick ice-covered Canada, pressing the land down. After the ice melted, the land began to rise or rebound (Fyon, 2020). In Northern Ontario, the land is rising faster because the ice sheet was centred where Hudson Bay is now.

Figure 8.2-37: Special Geologic and Geomorphic Features in the Existing Conditions Local Study Area and Construction Disturbance Area

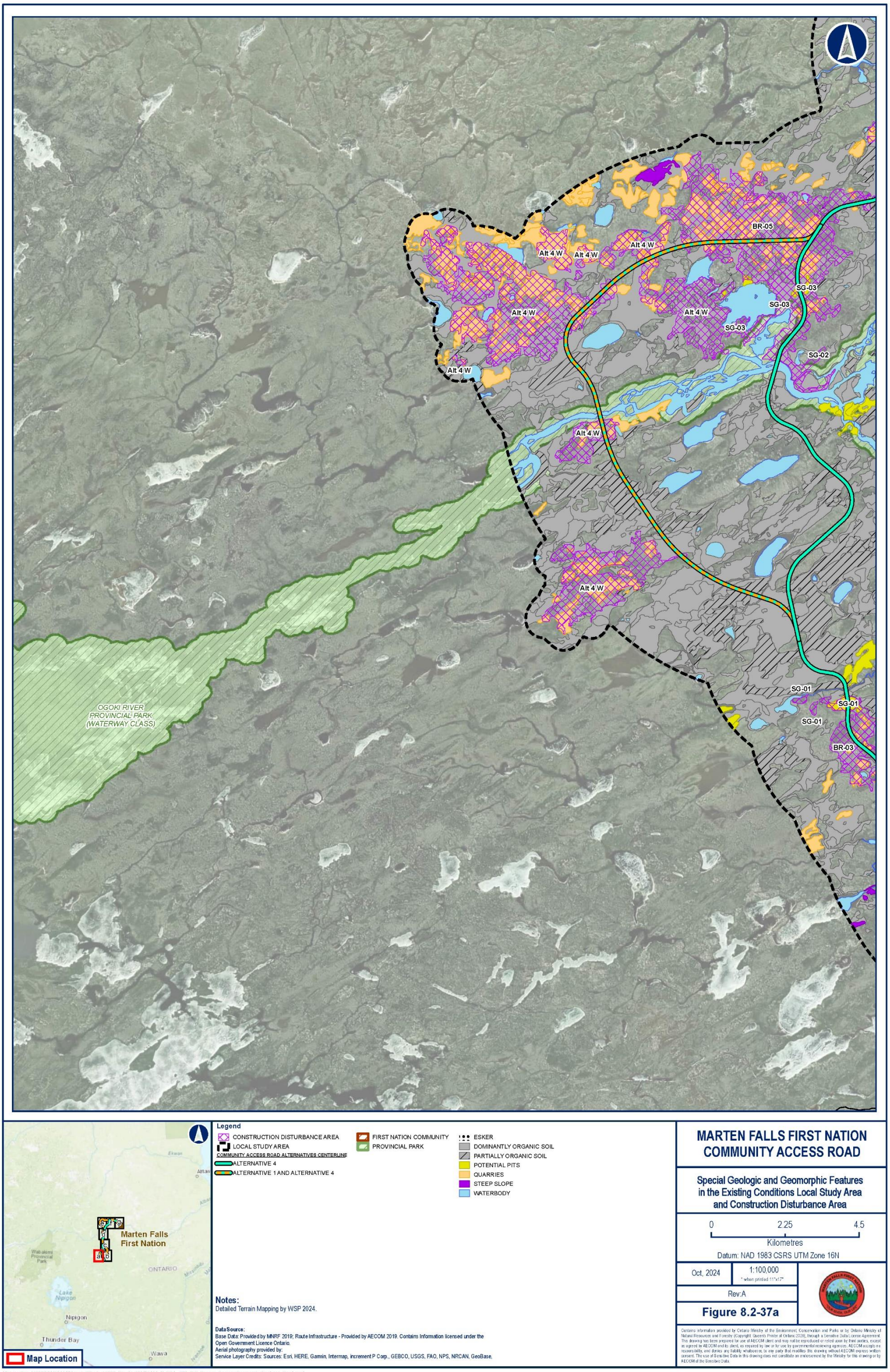


Figure 8.2-37b: Special Geologic and Geomorphic Features in the Existing Conditions Local Study Area and Construction Disturbance Area

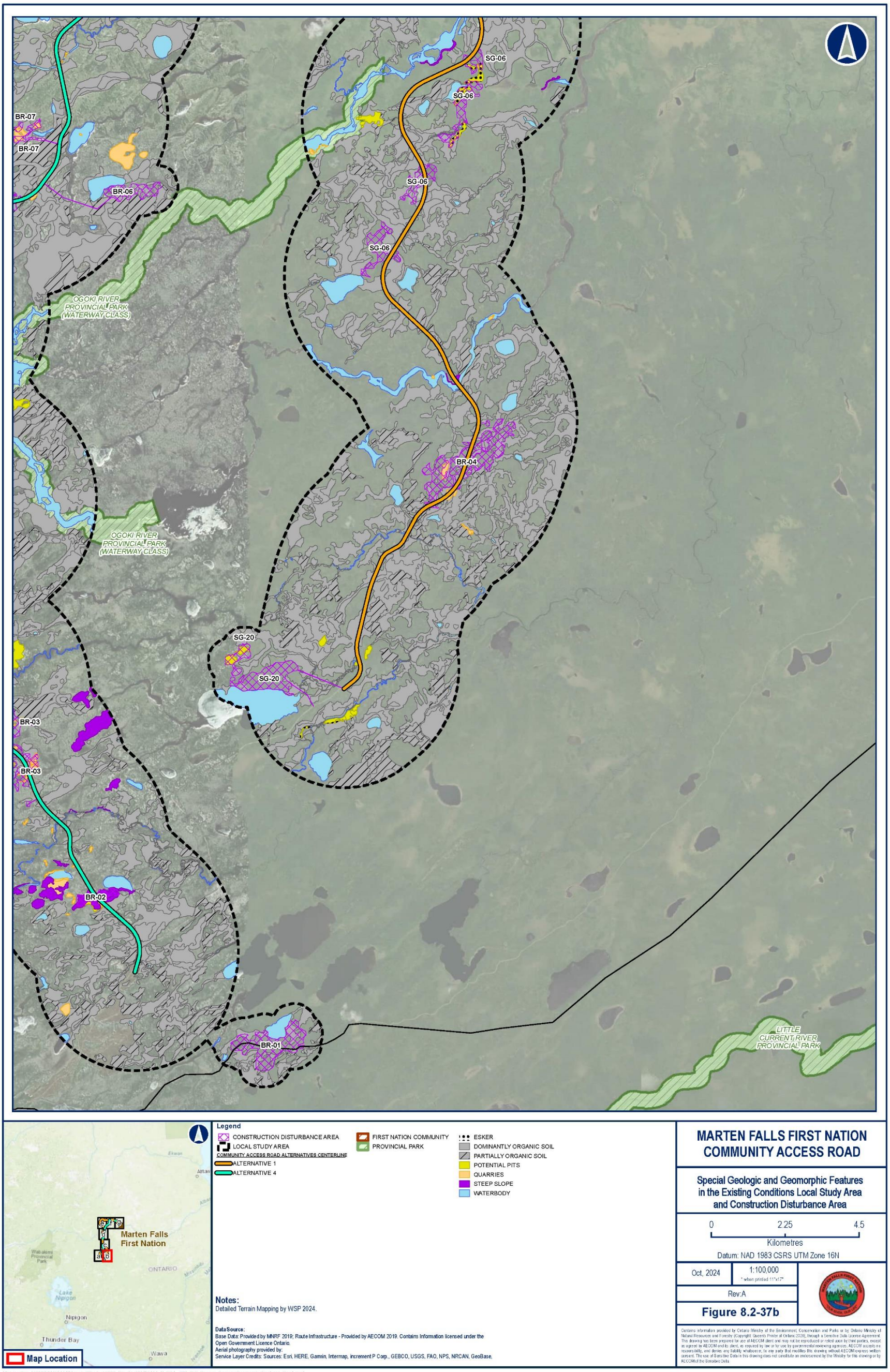


Figure 8.2-37c: Special Geologic and Geomorphic Features in the Existing Conditions Local Study Area and Construction Disturbance Area

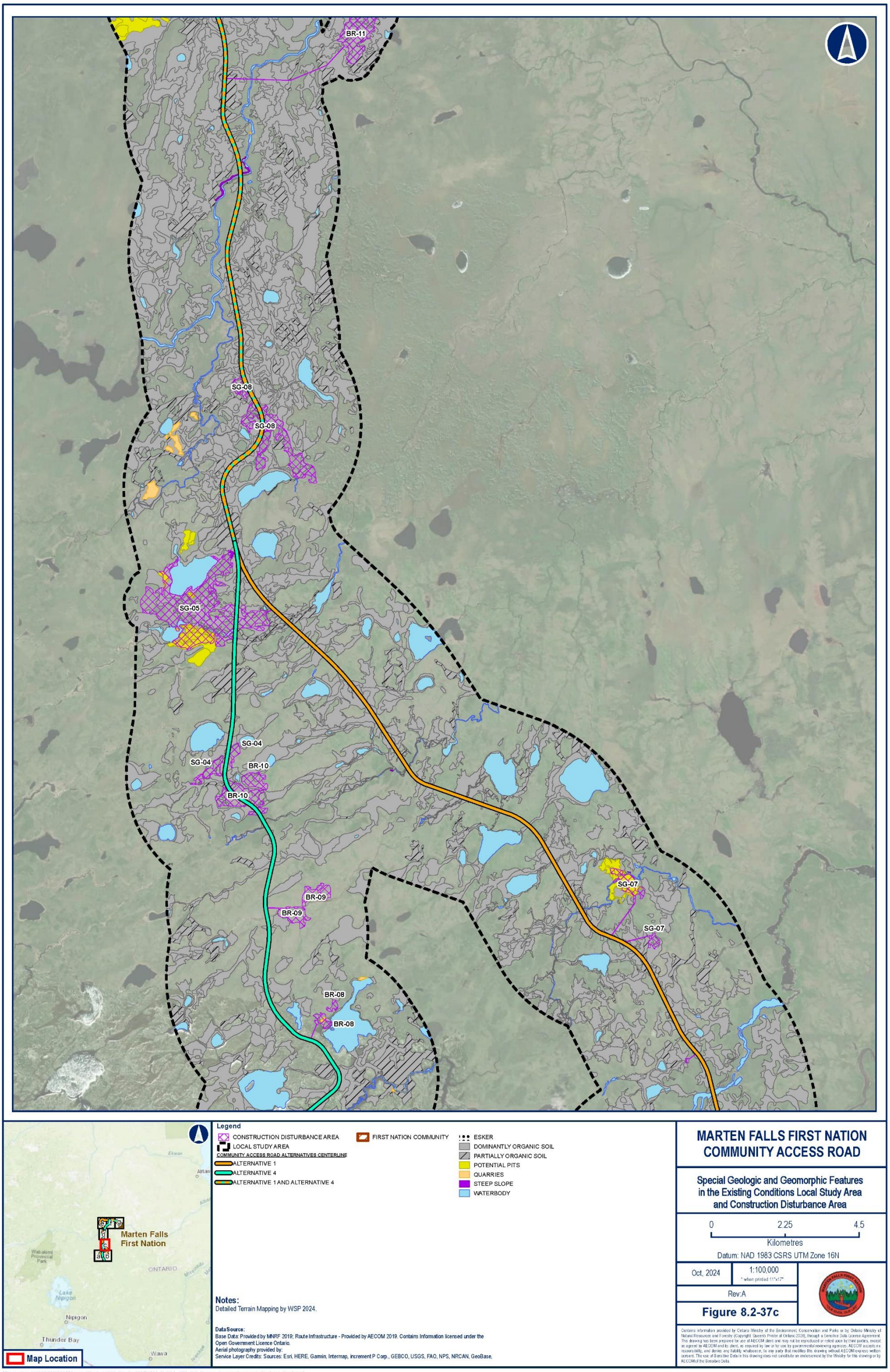


Figure 8.2-37d: Special Geologic and Geomorphic Features in the Existing Conditions Local Study Area and Construction Disturbance Area

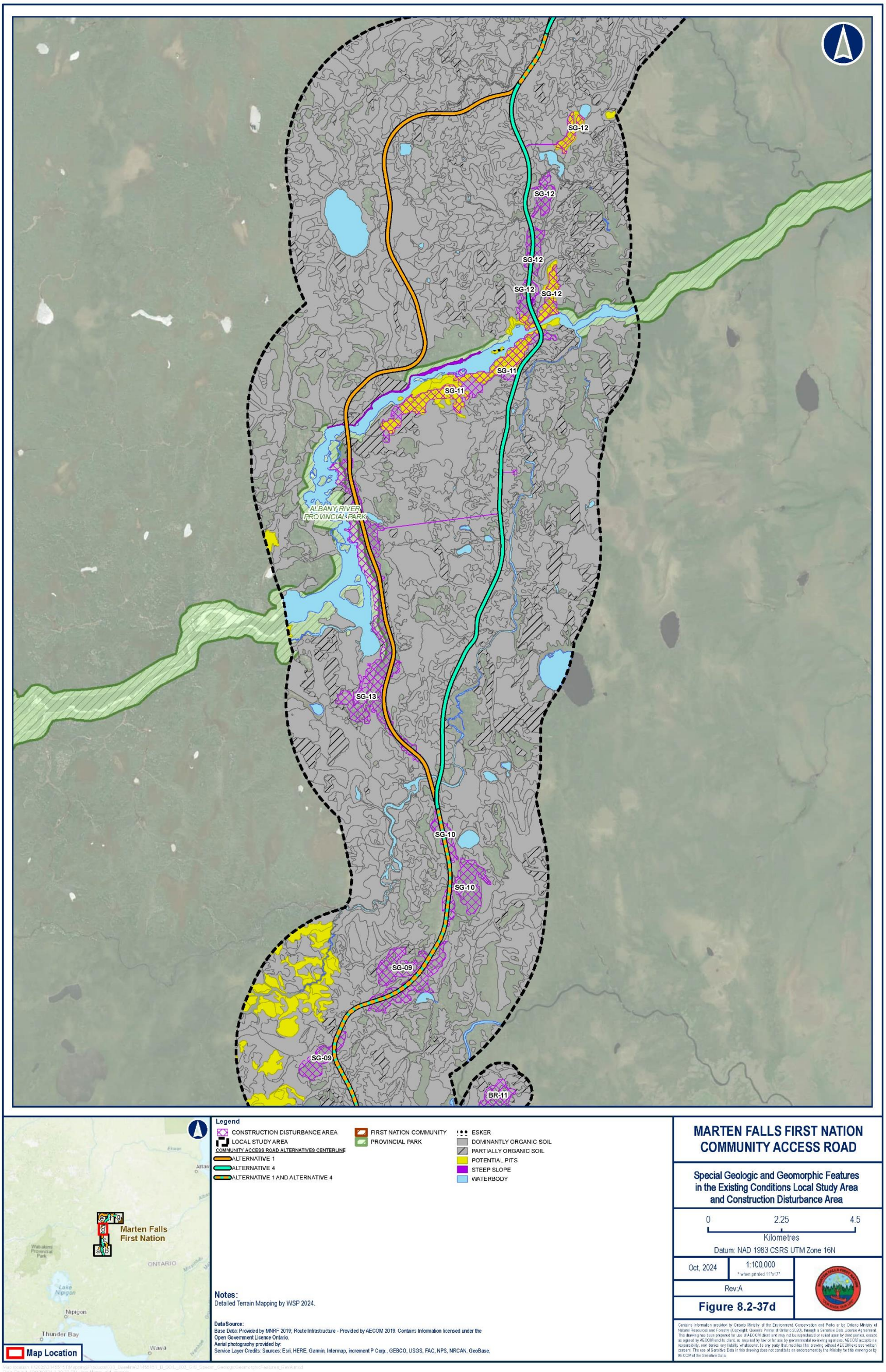


Figure 8.2-37e: Special Geologic and Geomorphic Features in the Existing Conditions Local Study Area and Construction Disturbance Area

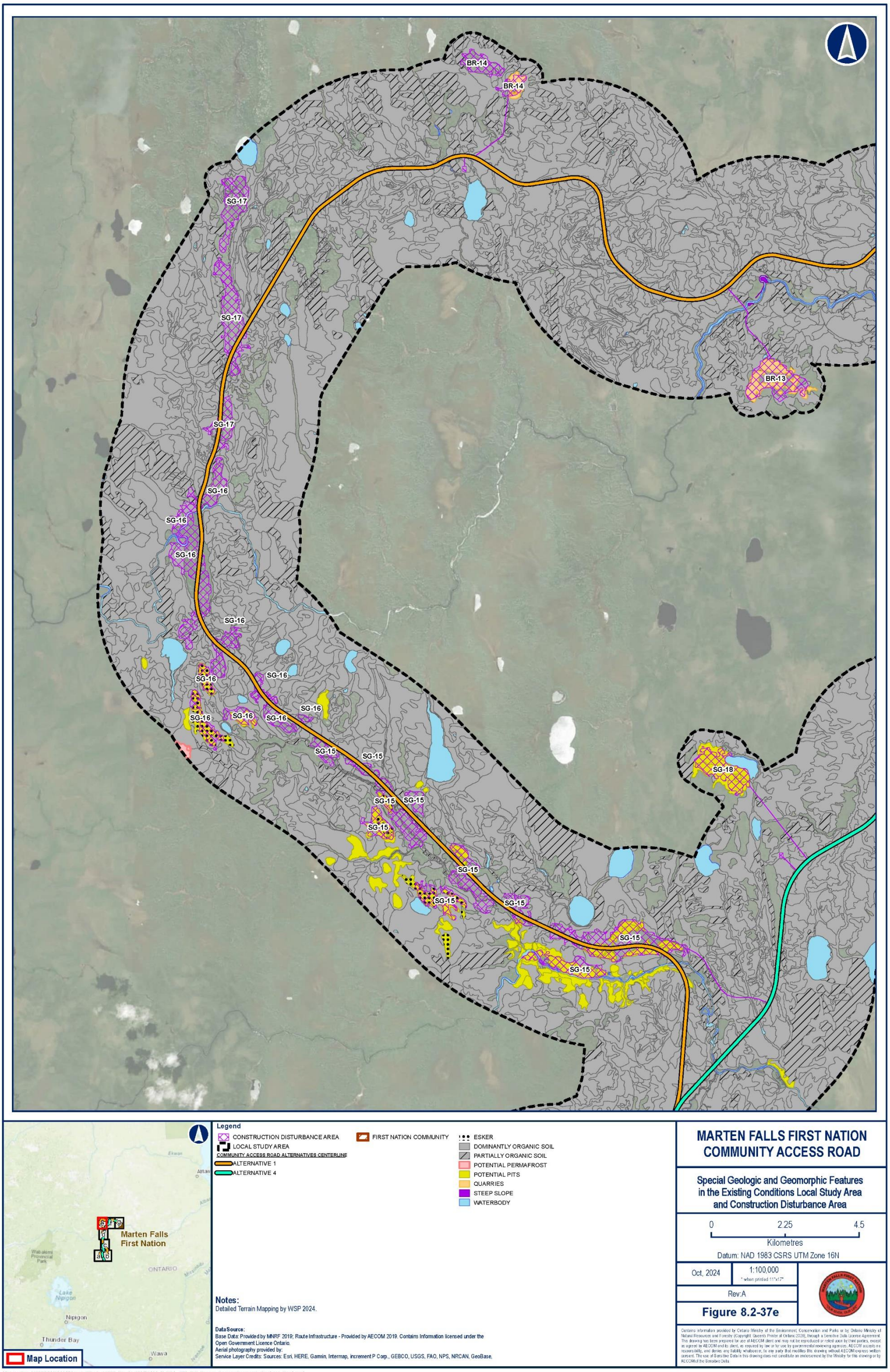


Figure 8.2-37f: Special Geologic and Geomorphic Features in the Existing Conditions Local Study Area and Construction Disturbance Area

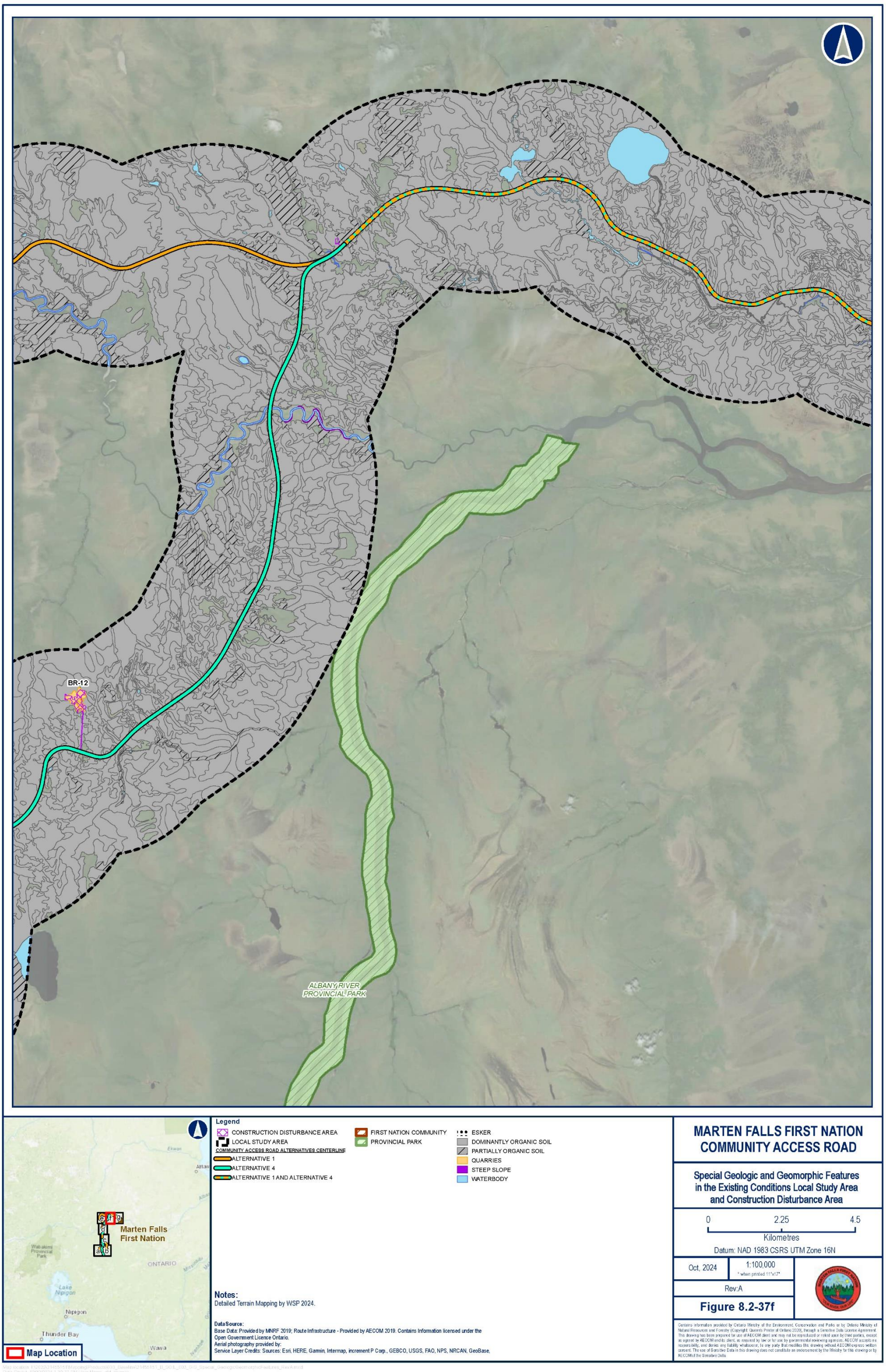
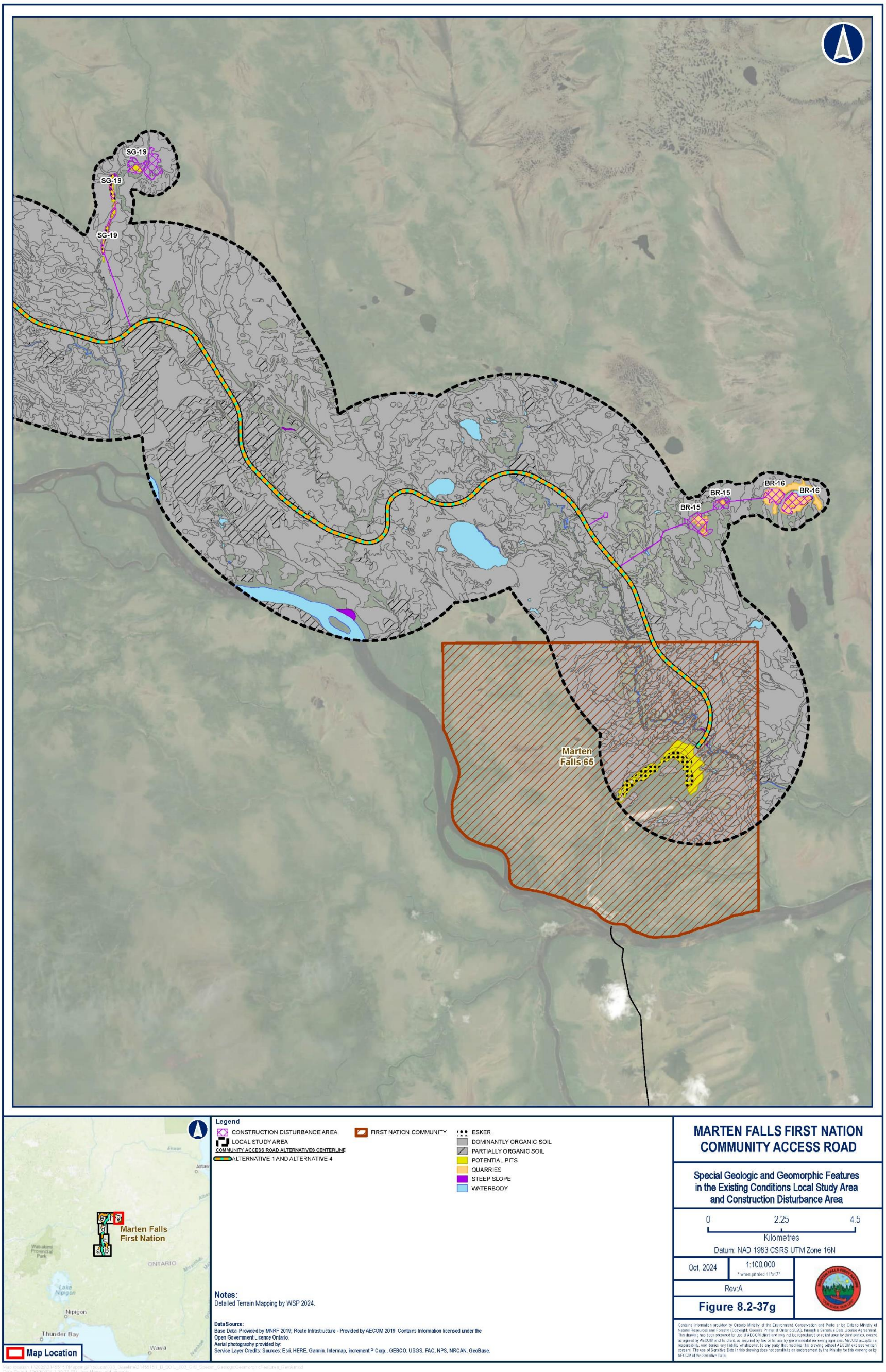


Figure 8.2-37g: Special Geologic and Geomorphic Features in the Existing Conditions Local Study Area and Construction Disturbance Area



Movements of the Canadian landmass are measured by the Canadian Base Network, which uses stable monuments with GPS antennas (Henton et al., 2006). The nearest station to the Regional Study Area is in Longlac, Ontario (Natural Resources Canada, 2022). Data from this network shows the land in the Regional Study Area is rebounding at about 6 to 7 millimetres per year (Henton et al., 2006).

8.2.8.5.6 Inundation / Flooding

Flooding, also called inundation, is a natural event that happens when rivers or waterbodies overflow during spring melt or after heavy rain (Parker, 1994). Besides weather-related flooding, beaver dams can also cause land to flood behind them.

Beavers are active in the Local Study Area, creating ponds behind their dams.

The Regional Study Area has many rivers, streams, and waterbodies. During field work in May 2022, flooding from spring melt and heavy rain was observed near active floodplains.

8.2.8.5.7 Karst

Karst is a type of terrain formed when carbonate rocks like limestone and dolomite dissolve due to interactions with groundwater. This process can create features like sinkholes, caves, and underground waterbodies, which can be hazardous to roads due to potential collapses.

Karst subsurface hazards were evaluated using publicly available bedrock geology maps from the Ontario Geological Survey (2011). In the Local Study Area, limestone and dolostone are identified as part of the Red Head Rapids Formation and the Churchill River Group at the northeast end of the Community Access Road near Marten Falls.

A search of publications from the Ontario Geological Survey and the Geological Survey of Canada found no evidence of karst processes in the bedrock formations of the Regional Study Area. Therefore, the potential for karst in this area is considered low.

8.2.8.5.8 Soil Erosion

Soil erosion potential refers to the risk of soil quality degradation or soil loss due to wind and water. Erosion can reduce soil productivity by removing fine particles and organic matter from the surface.

The risk of wind and water erosion is mainly linked to disturbances in vegetation and soil and is generally limited to the Construction Disturbance Area.

Small-scale soil mapping suggests that the southern part of the Regional Study Area might be prone to wind erosion if sandy Brunisols are present.

8.2.8.6 Special Geologic and Geomorphic Features

8.2.8.6.1 Pits and Quarries

Potential pits and quarries were identified using detailed terrain mapping. Pits are found in areas with glaciofluvial deposits, while quarries are in areas with bedrock or thin till veneers over bedrock. The areas mapped as bedrock by the Ontario Geological Survey (2018) were refined based on the detailed terrain mapping which used stereo aerial photographs and Light Detection and Ranging data.

Potential pit areas have been identified in the following areas and are shown on **Figure 8.2-37**:

- Alternative 4, SG-01. Thin layers of sediments deposited by glacial meltwater (called glaciofluvial sediments) have been mapped on top of older glacial deposits (till), but these layers have not been checked in the field yet. Some other areas with these meltwater sediments, which are generally less than 1 metres thick, have been confirmed about 500 metres northeast of SG-01 (field verified). Similar sediments have been identified about 1.7 kilometres west of SG-01 at the edge of the Local Study Area (non-verified);
- Alternative 1, SG-20. Two area have been mapped where thin layers of sediments deposited by glacial meltwater (glaciofluvial sediments) are lying on top of older glacial deposits (till). These areas have not been field verified;
- Alternative 1, the two northerly segments of SG-06. Ridges (eskers) of glaciofluvial sediment. An additional area of hummocky glaciofluvial sediments has also been identified adjacent to the Ogoki River and approximately 1.8 kilometres west of the SG-06. None of these areas have been field verified;
- Alternative 1, SG-07. Blankets of glaciofluvial sediments overlying till. This area has not been field verified;
- Alternative 4, several areas in SG-05, south and west of Winslow Lake. An additional area not within a proposed pit area has also been identified north of Winslow Lake. Undulating to gently sloping glaciofluvial sediments which have not been field verified;

- Alternative 1 and 4, northwest and west of SG-09. Veneers and blankets of glaciofluvial sediments overlying glaciolacustrine sediments or till. This area has not been field verified and is currently not identified as a potential pit;
- Alternative 1 and 4, southwest of SG-09. Thick undulating glaciofluvial sediments which have not been field verified and are currently not identified as a potential pit;
- Alternative 4, south of the Albany River in SG-11, and north of the Albany River in SG-12 (southeast and north sections). Mainly undulating to gently sloping and terraced glaciofluvial sediments the majority of which have not been field verified;
- Alternative 1, various areas identified within SG-15 and the southern areas of SG-16 south of the Wabassi River. Additional areas of glaciofluvial sediments not within the SG-15 and SG-16 boundaries have also been identified in this area. The thickness of glaciofluvial sediments ranges from thick undulating and ridged deposits to veneers and blankets overlying till, glaciolacustrine sediments or bedrock. Only a few of the areas identified have been field verified;
- Alternative 4, SG-18 on the south shore of Mink Lake. Gently sloping to moderately sloping and undulating glaciofluvial sediments (field verified). West of Mink Lake the glaciofluvial sediments are thought to be thinner (less than 1 metres in thickness) and overlying till (non-verified);
- Alternative 1, near Marten Falls. This area has one of the most extensive ridges of glaciofluvial sediments within the Local Study Area. This area is currently being used by the Community as a sand resource and is currently not being considered as a pit resource for the Community Access Road. A small area of glaciofluvial blankets overlying till has also been mapped in this area at the end of the proposed alignment;
- Alternative 1, approximately 1 kilometre east of Painter Lake. This is an area of undulating to ridged glaciofluvial sediments. There are additional small areas of thick glaciofluvial sediments between approximately 1.8 and 2.6 kilometres northeast of Painter Lake. One of the areas is crossed by the proposed alignment, with another approximately 210 metres northeast of the proposed alignment. None of these areas have been field verified and are currently not being considered as pit resources for the Community Access Road;
- Alternative 1 and 4, the southern areas of SG-19 near the Buffaloskin River (Oji-Cree translation, Majih Waayaan Ih Ziibih). Ridges of glaciofluvial sediments have been identified in addition to blankets and veneers of glaciofluvial material overlying till. These areas have not been field verified;

- Alternative 4, SG-03 north of Patience Lake (Oji-Cree translation, Bakihda'hawgan) and a small area between the southwest edge of BR-05. These areas and the lake have been mapped as undulating to hummocky glaciofluvial sediments. These areas have not been field verified. A small area of glaciofluvial veneers and blankets overlying bedrock have also been mapped at the east edge of Alternative 4 west quarry area west of Patience Lake. This area was identified during the field program;
- Alternative 4, immediately south of BR-02, approximately 2 kilometres northwest of Painter Lake Road. Veneers of glaciofluvial sediment overlying till (field verified); and
- Alternative 4, south of the Ogoki River on the east side of the Local Study Area. Veneers of glaciofluvial sediments overlying till. This area has not been field verified.

Potential quarries have been identified in the following areas and are shown on **Figure 8.2-37**:

- Alternative 4, BR-02 and BR-03, with additional areas of bedrock exposed at the western edge of the Local Study Area between BR-02 and BR-03;
- Alternative 4, Alt 4 W south and north of the Ogoki River, and BR-05, areas of exposed bedrock have been mapped in these areas, surrounded by thin veneers and veneers of till overlying bedrock. Veneers are thin layers of material covering a surface;
- Alternative 1, BR-04, bedrock mapped at the surface in some of this area, with veneers of till overlying bedrock or veneers of organic soil overlying till veneers mapped in this area;
- Alternative 4, BR-07 and BR-08, small areas of bedrock have been mapped in these areas;
- Alternative 4, BR-12, thin veneers and veneers of till overlying bedrock have been mapped in this area;
- Alternative 1, BR-13 south of the Wabassi River, bedrock mapped at the surface in some of this area, with veneers of till overlying bedrock mapped elsewhere in this area;
- Alternative 1, BR-14 north of Oxtoby Lake, bedrock mapped at the surface in some of this area, with veneers of till overlying bedrock mapped elsewhere in this area; and

- Alternative 1 and 4, BR-15 and BR-16, bedrock mapped at the surface in some of these two areas, with thin veneers and veneers of till overlying bedrock mapped elsewhere in these areas.

8.2.8.6.2 Eskers

Eskers are low ridges composed of glaciofluvial sand and gravel formed by deposition from meltwater running through a channel beneath or within glacier ice (Howes and Kenk, 1997). They are potential sources of aggregate material. Eskers are important for lichen growth that support caribou.

Previous mapping (Ontario Geological Survey, 2018) identified several eskers within the Local Study Area. The detailed terrain mapping has identified several areas within the Local Study Area where ridged glaciofluvial sediments have been identified.

Areas where eskers have been identified include (but are not limited to) to the locations listed and are shown on **Figure 8.2-37**:

- Alternative 1, SG-06 south of the Ogoki River;
- Alternative 1, SG-15 south and southwest of Maxey Lake and SG-16;
- Alternative 1 and 4, SG-19 approximately 25 kilometres northwest of Marten Falls; and
- Alternative 1, near Marten Falls, which has one of the most extensive ridges of glaciofluvial sediments within the Local Study Area.

8.2.8.6.3 Organic Soils

The Local Study Area has many areas with very poorly drained organic soils. Thinner organic soils are more common in the southern part of the Community Access Road, where they gather in low spots and flat areas between bedrock hills or exposed bedrock. Thicker organic soils are found in both Alternatives 1 and 4, north of Winslow Lake. The most extensive organic soils are along the western part of Alternative 1, including Maxey Lake, the Wabassi River, and Oxtoby Lake. Alternative 4 includes Trebell Lake and the Wabassi River, and both Alternatives 1 and 4 include the Alder River (Oji-Cree translation, Wadobii Wih Ziibih), Gittins Lake (Kamaashkiikosih Nowih Zaakaihgan), the Buffaloskin River, and the jiigaakodigweyaa wih zaagaihgan.

Areas of organic accumulation are shown on **Figure 8.2-38** and include terrain units mapped as organic in the detailed terrain mapping or any terrain unit that had organic material mapped as a subdominant component (second decile is “O”).

Figure 8.2-38: Soil Map Units in the Marten Falls Community Access Road Existing Conditions Local Study Area and Construction Disturbance Area

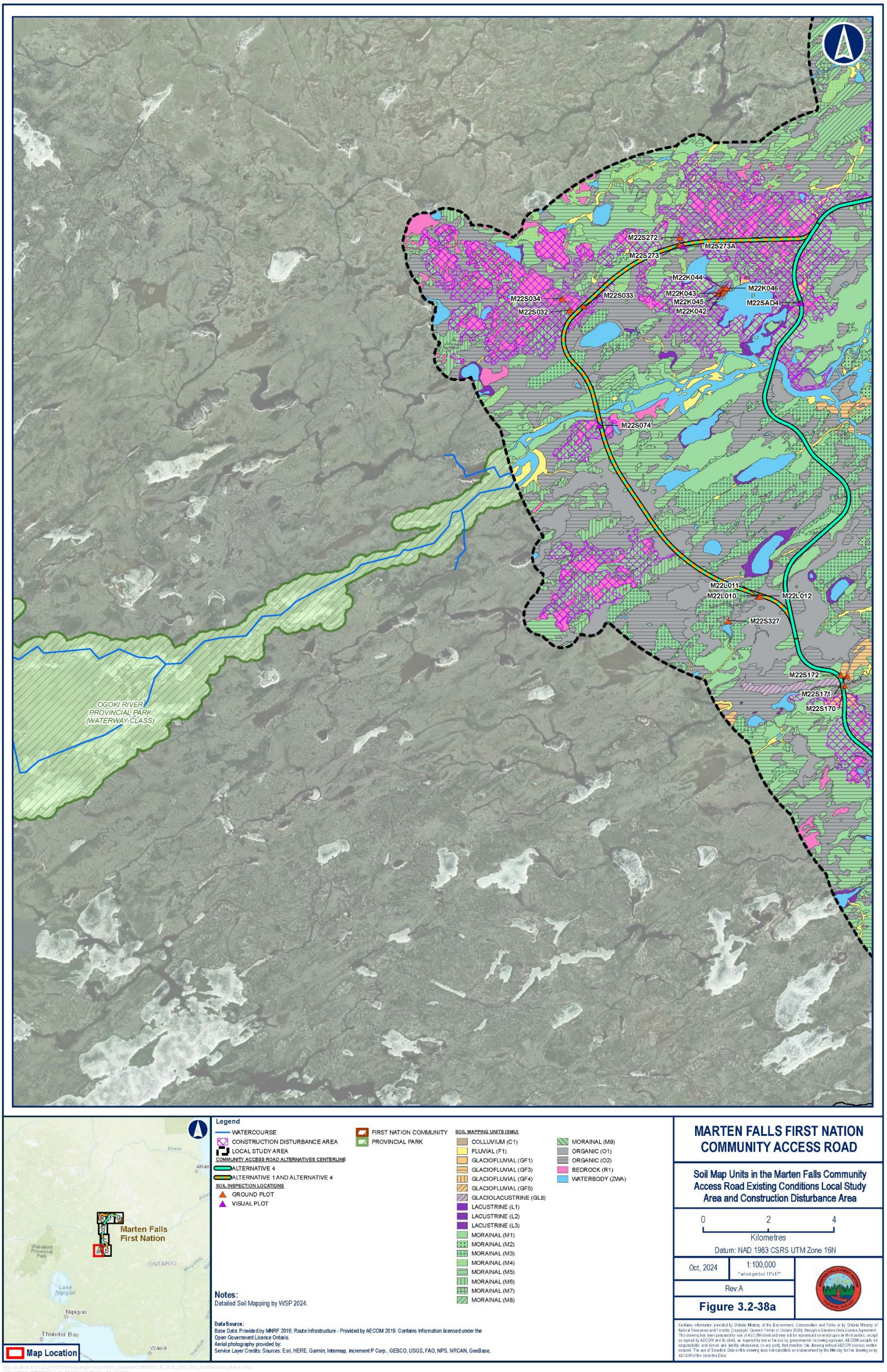


Figure 8.2-38b: Soil Map Units in the Marten Falls Community Access Road Existing Conditions Local Study Area and Construction Disturbance Area

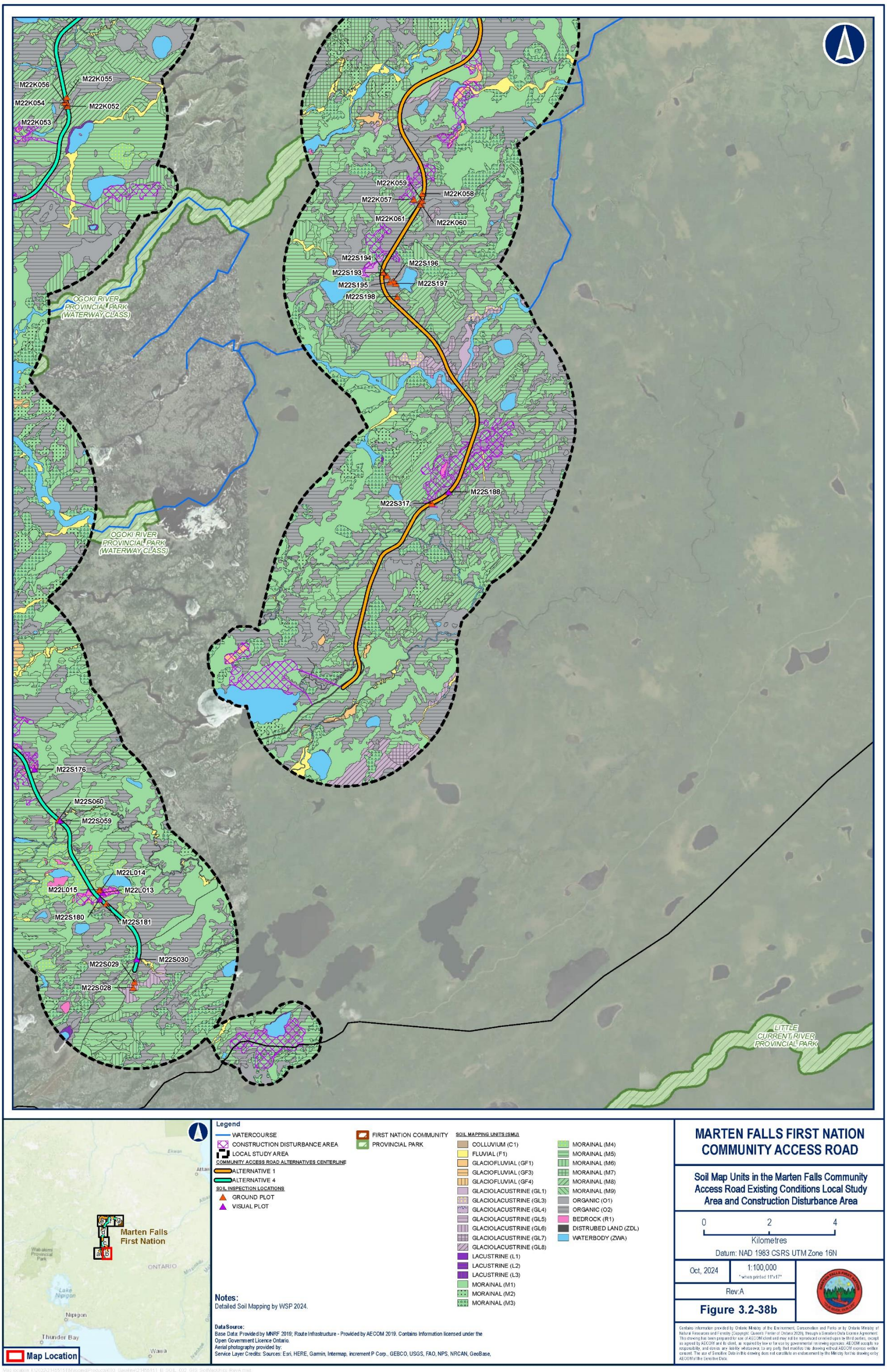


Figure 8.2-38c: Soil Map Units in the Marten Falls Community Access Road Existing Conditions Local Study Area and Construction Disturbance Area

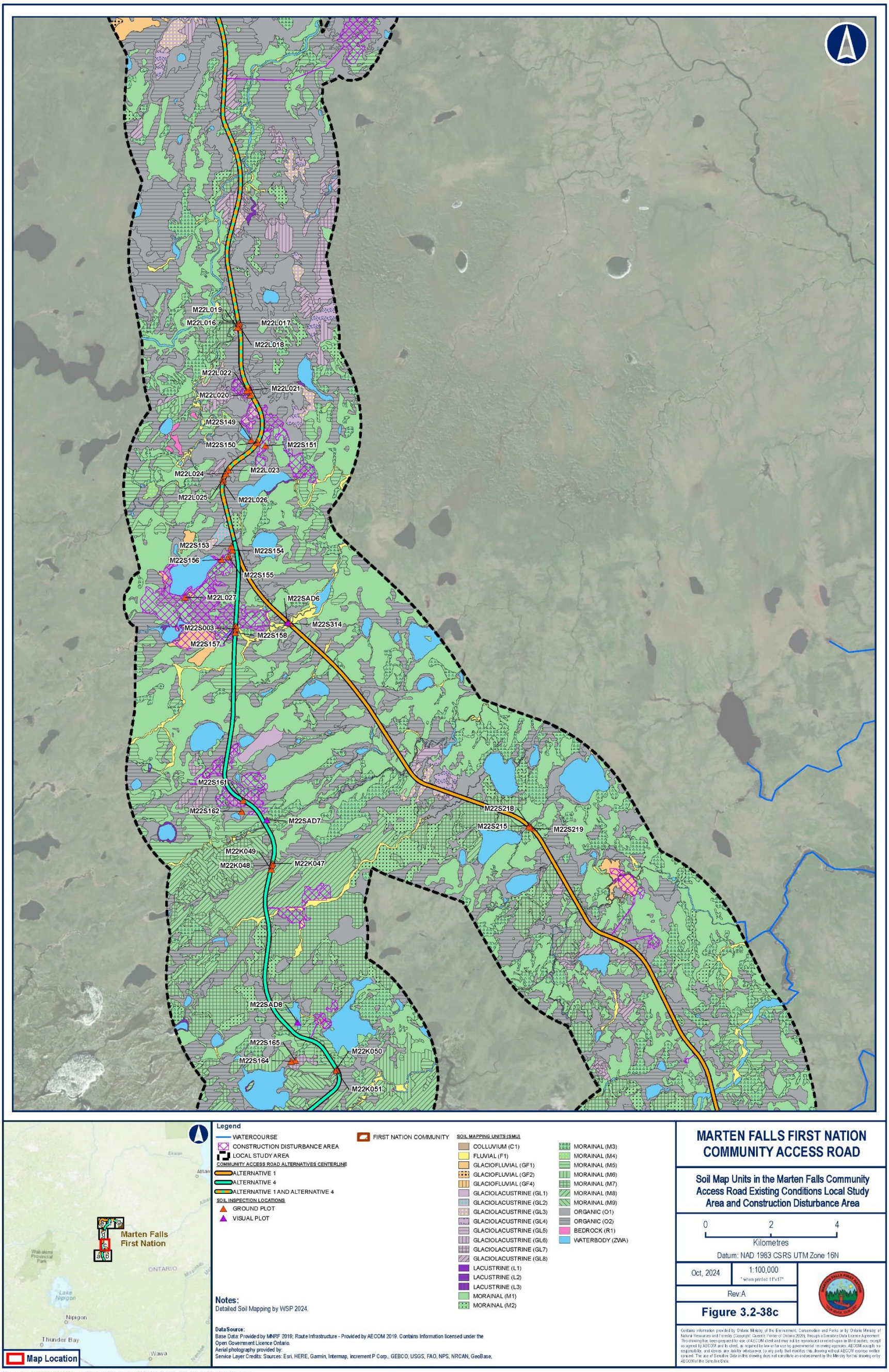


Figure 8.2-38d: Soil Map Units in the Marten Falls Community Access Road Existing Conditions Local Study Area and Construction Disturbance Area

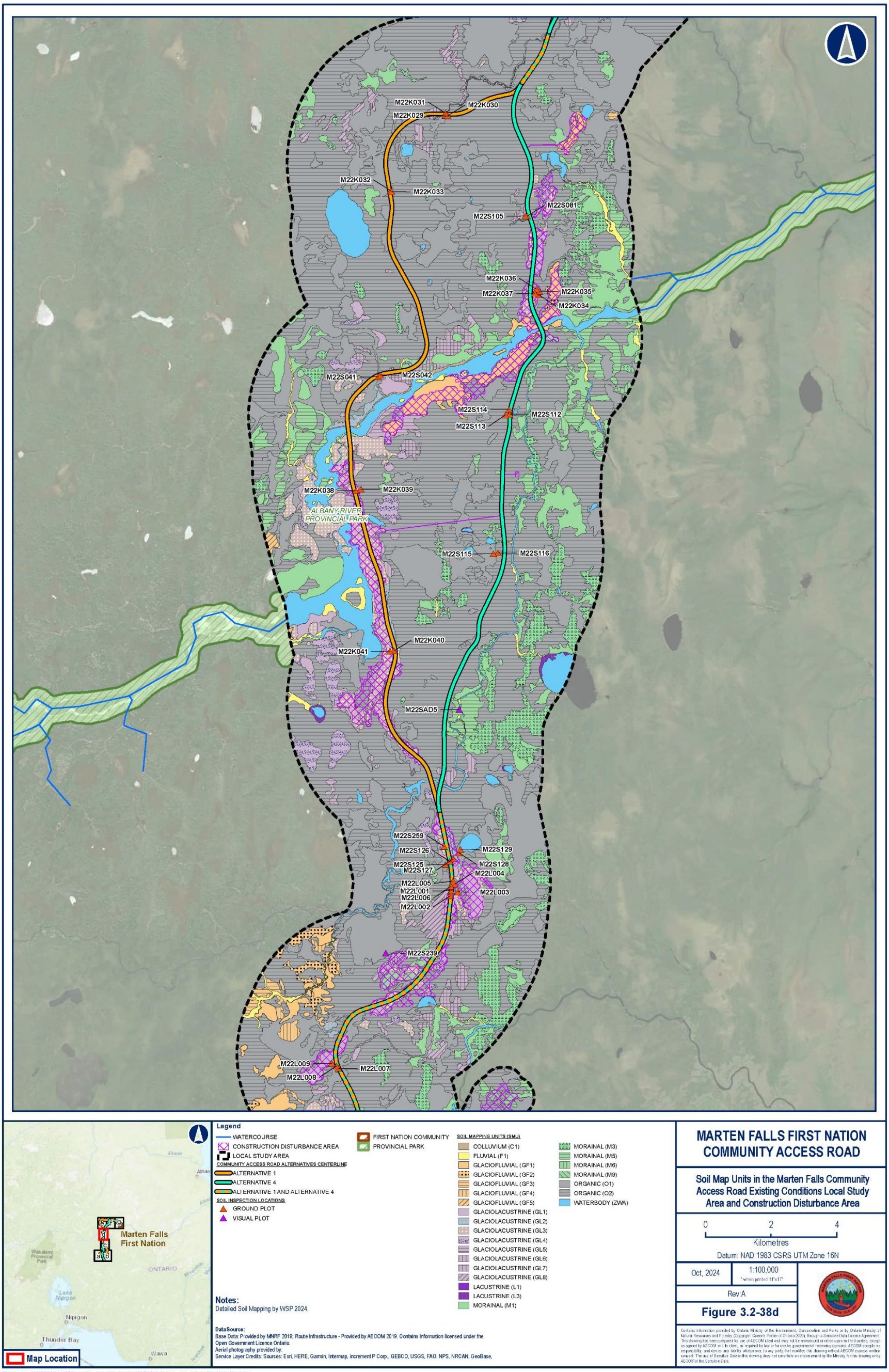


Figure 8.2-38e: Soil Map Units in the Marten Falls Community Access Road Existing Conditions Local Study Area and Construction Disturbance Area

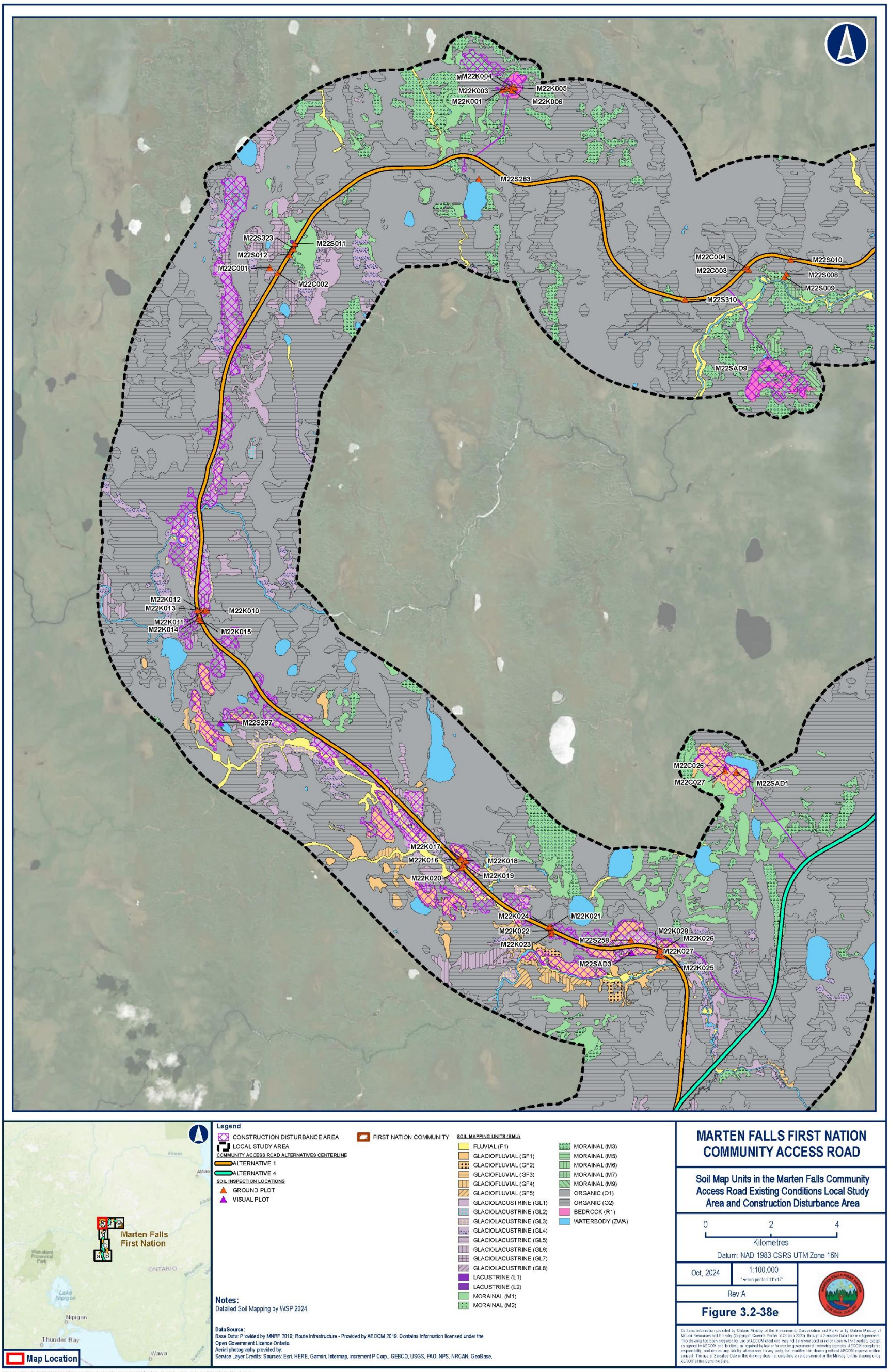


Figure 8.2-38f: Soil Map Units in the Marten Falls Community Access Road Existing Conditions Local Study Area and Construction Disturbance Area

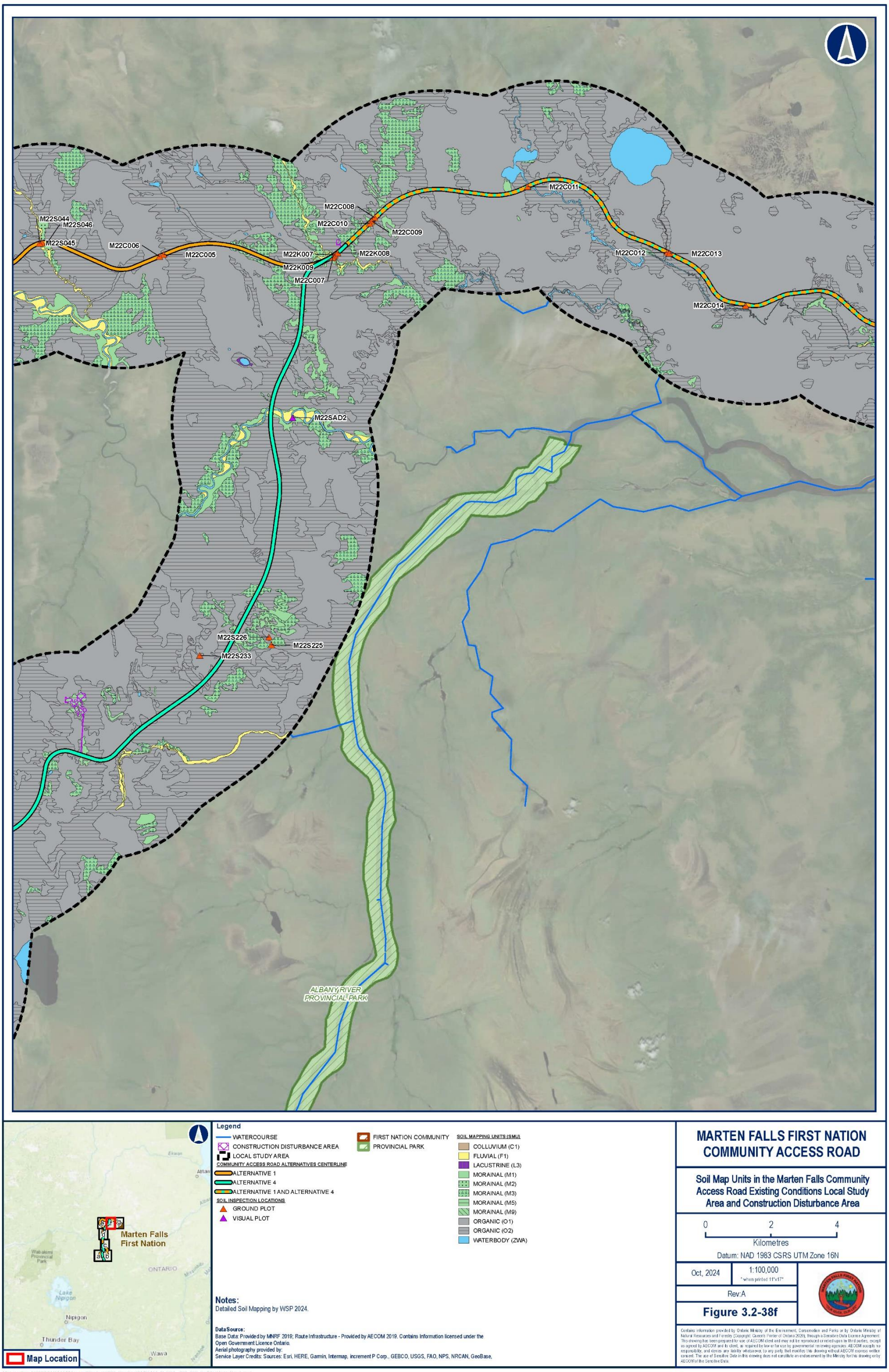
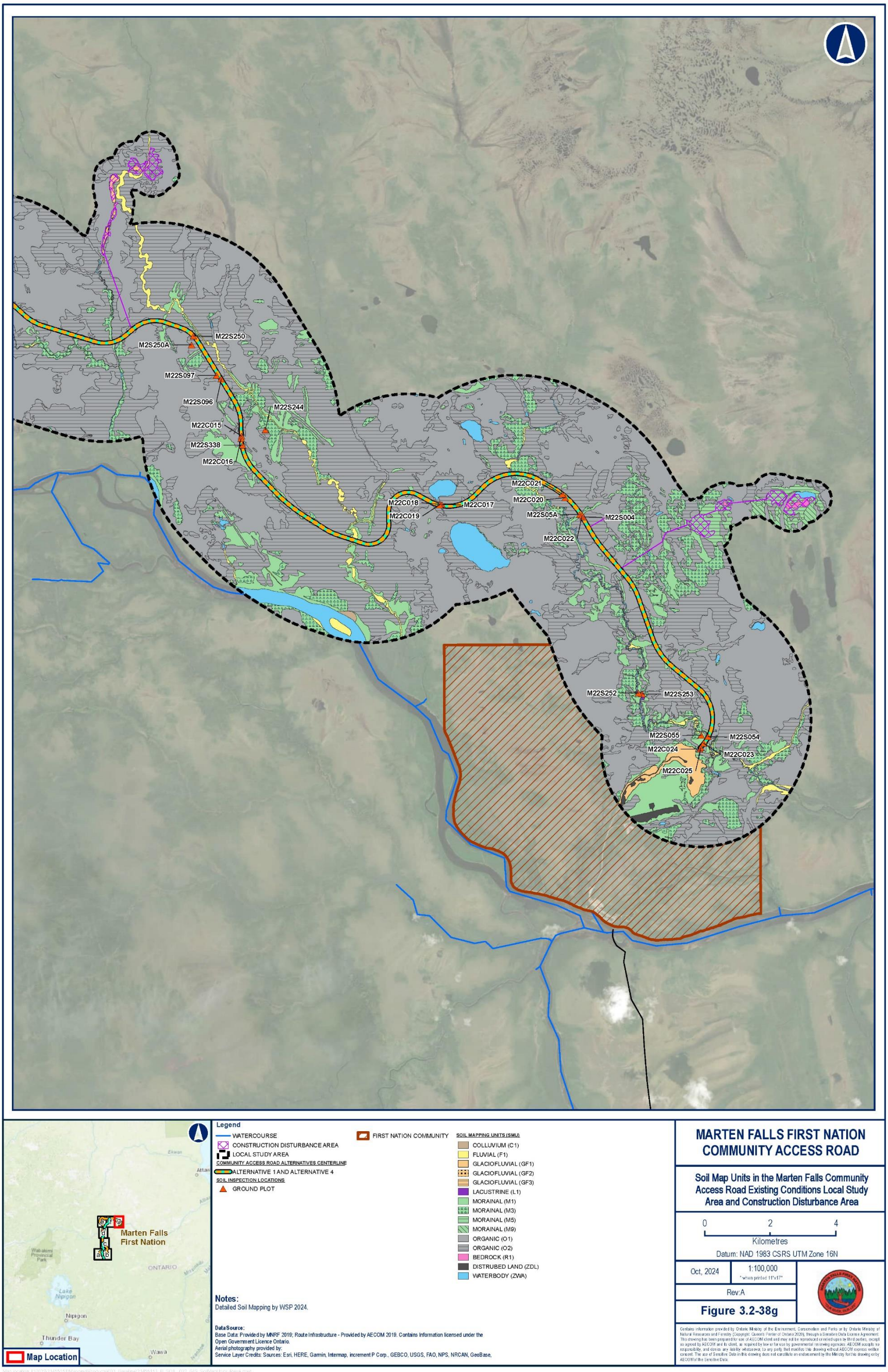


Figure 8.2-38g: Soil Map Units in the Marten Falls Community Access Road Existing Conditions Local Study Area and Construction Disturbance Area



8.2.8.7 Soils

8.2.8.7.1 Soil Characteristics

Much of the Local Study Area is mostly flat with level organic soil areas. More than half of the area has been mapped as organic soil. There are only a few steeper slopes with bedrock outcrops scattered around.

The soil types in the area range from coarse sands to very fine heavy clays. Field data shows that over half of the soil textures are moderately to very fine, with fewer coarse sandy textures. The main types of mineral soils are Luvisolic, with Brunisolic soils being the second most common. Most Brunisolic soils are classified as Eutric because their pH values are above 5.5.

Soil characteristics are summarized in **Table 8.2-36**.

8.2.8.7.2 Soil Chemistry and Physical Characteristics

Soil samples were taken from 17 locations. A total of 57 samples were collected and sent to Bureau Veritas Laboratories for testing. Some samples were tested for harmful chemicals and radioactive materials. All tested samples had less than 0.02 milligrams per kilogram of harmful chemicals and less than 0.08 milligrams per kilogram of volatile substances. The samples tested for radioactivity had less than 1.0 becquerels per gram. Detailed results can be found in **Appendix N** along with results compared with Canadian Council of Ministers of the Environment (2014) guidelines and criteria.

Three samples have concentrations of metals higher than the guidelines, and the locations of these sites is provided on **Figure 8.2-39**:

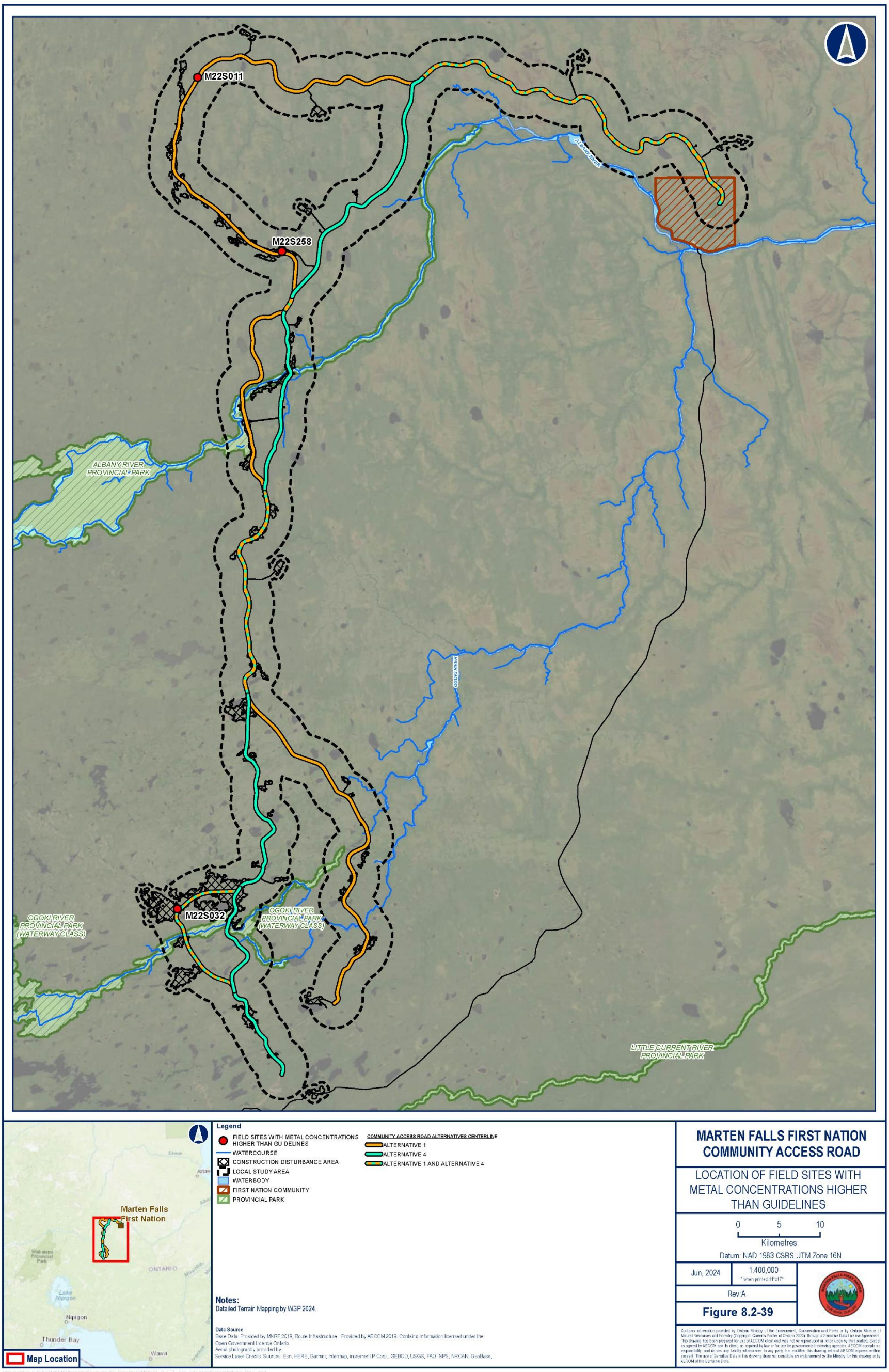
- M22S258-GEOCHEM exceeds the criteria for chromium and nickel (within the SG-15 aggregate area);
- M22S011-GEOCHEM exceeds the criteria for arsenic (approximately 2 kilometres east of aggregate area SG-17); and
- M22S032-GEOCHEM exceeds the criteria for chromium (within the BR-05 aggregate area).

Table 8.2-36: Soil Map Unit Characteristics

Soil Map Unit	Associated Surficial Material and Texture Class	Representative Description	Local Study Area (hectare)	Local Study Area (percent)	Construction Disturbance Area (hectare)	Construction Disturbance Area (percent)
C1	Moderately fine-textured colluvium, potentially over moderately fine-textured second parent material	Orthic Regosol composed of moderately fine colluvium potentially overlying moderately fine / fine-textured second parent material. Drainage and textures of material may vary based on location.	74.8	Less than 0.1	5.7	Less than 0.1
F1	Medium-textured fluvial material	Rego Gleysol developed on medium-textured fluvial material. Soils may be underlain by a second parent material, generally of a fine texture.	2,323.2	1.2	119.0	1.0
GF1	Very coarse-textured glaciofluvial material	Eluviated Dystric Brunisol developed on very coarse-textured glaciofluvial material. Contains inclusions of eluviated Brunisols with lower pH levels (such as, Dystric Brunisols). Map unit contains inclusions of various drainage conditions.	1,715.2	0.9	855.3	6.7
GF2	Very coarse-textured glaciofluvial material	Orthic Gleysol developed on very coarse-textured glaciofluvial material. Contains inclusions of less developed Rego Gleysols.	142.4	0.1	9.0	0.1
GF3	Very coarse glaciofluvial material over moderately fine to fine-textured second parent material	Brunisolic Gray Luvisol developed on very coarse-textured glaciofluvial material. The parent material at depth is fine to moderately fine-textured till or glaciolacustrine sediment. May contain soils with a lesser amount of pedogenic development (such as, Brunisolic) with similar surficial material textures. Contains inclusions of imperfectly drained subgroups, such as, gleyed subgroups.	353.9	0.2	88.5	0.7
GF4	Very coarse glaciofluvial material over fine-textured second parent material	Rego Gleysol formed on very coarse glaciofluvial sediment overlying fine-textured till.	139.7	0.1	2.9	Less than 0.1
GF5	Very coarse to medium-textured glaciofluvial over bedrock	Orthic Eutric Brunisol formed on very coarse to medium-textured glaciofluvial material, underlain by consolidated bedrock. Map unit may contain isolated pockets of imperfectly drained soils.	90.0	Less than 0.1	7.2	0.1
GL1	Medium-textured glaciolacustrine material	Eluviated Eutric Brunisol developed on medium-textured glaciolacustrine material. May include soils with a greater amount of pedogenic development (such as, Luvisolic soils) where surficial material textures are similar.	1,395.8	0.7	584.3	4.6
GL2	Medium-textured glaciolacustrine material	Gleyed Eluviated Eutric Brunisol developed on medium-textured glaciolacustrine material.	183.0	0.1	63.1	0.5
GL3	Moderately fine to fine-textured glaciolacustrine	Orthic Gray Luvisol developed on moderately fine to fine-textured glaciolacustrine material. Inclusions of less developed soils (such as, Regosols soils) and imperfectly drained subgroups (such as, gleyed subgroups) are present.	1,730.6	0.9	790.1	6.2
GL4	Moderately fine to fine-textured glaciolacustrine	Gleyed Gray Luvisol developed on moderately fine to fine glaciolacustrine material.	1,319.7	0.7	115.0	0.9
GL5	Medium-textured glaciolacustrine material	Rego Gleysol developed on medium-textured glaciolacustrine material. Map unit composed of soils that are poorly drained.	691.8	0.3	61.9	0.5
GL6	Moderately Fine to Fine Glaciolacustrine material	Orthic Gleysol formed on moderately fine to fine-textured glaciolacustrine material. Map unit composed of soils that are poorly drained.	562.2	0.3	62.5	0.5
GL7	Medium to fine-textured glaciolacustrine over a second parent material	Orthic Gray Luvisol formed on moderately fine to fine-textured glaciolacustrine material. Profile underlain by second parent material of various textures and depositional sources. Map unit includes drainages ranging from rapid to well drained.	883.2	0.4	97.7	0.8
GL8	Medium to fine-textured glaciolacustrine over a second parent material	Orthic Luvic Gleysol formed on moderately fine to fine-textured glaciolacustrine material. Profile underlain by second parent material of various textures and depositional sources or by bedrock. Map unit contains imperfectly drained soils.	793.4	0.4	56.1	0.4
L1	Moderately fine to fine-textured lacustrine material over a second parent material	Rego Gleysol formed on moderately fine to fine-textured lacustrine material, underlain by a second parent material. Map unit contains soils that are imperfectly drained.	70.5	Less than 0.1	2.4	Less than 0.1

Soil Map Unit	Associated Surficial Material and Texture Class	Representative Description	Local Study Area (hectare)	Local Study Area (percent)	Construction Disturbance Area (hectare)	Construction Disturbance Area (percent)
L2	Moderately fine to fine-textured lacustrine material	Orthic Regosol developed on moderately fine to fine-textured lacustrine material. Map unit contains soils that are well drained.	23.0	Less than 0.1	0.6	Less than 0.1
L3	Moderately fine to fine-textured lacustrine material	Rego Gleysol developed on moderately fine to fine-textured lacustrine material. Map unit contains soils that are imperfectly drained.	190.1	0.1	5.1	Less than 0.1
M1	Moderately fine to very fine-textured till	Orthic Gray Luvisol developed on moderately fine to very fine-textured till. Soils with less pedogenic development (such as, Brunisols) have been included in this map unit if surficial material textures are similar. Bedrock identified beneath till blankets or deeper is not considered here.	19,352.1	9.8	858.1	6.8
M2	Moderately fine to medium-textured till	Gleyed Gray Luvisol developed on moderately fine-textured till.	1,473.8	0.7	10.9	0.1
M3	Moderately fine to fine-textured till	Orthic Gleysol formed on moderately fine to fine-textured till material. Has inclusions of moderately coarse-textured parent material. Has imperfectly drained (in other words, gleyed) subgroup inclusions.	12,093.8	6.1	276.5	2.2
M4	Very coarse to moderately coarse-textured till over bedrock	Orthic Humo-Ferric Podzol formed on moderately coarse till material. May include less developed profiles (such as, Brunisols).	1,179.9	0.6	357.0	2.8
M5	Moderately fine to very fine-textured till over bedrock	Orthic Gray Luvisol on moderately fine to very fine-textured till material. Contains inclusions of imperfectly drained (such as, gleyed subgroup) soils. Map unit may contain inclusions of moderately coarse) to medium-textured layers of parent materials.	11,668.5	5.9	1,547.0	12.2
M6	Moderately fine to fine-textured till over bedrock	Orthic Gleysol formed on fine-textured till material, underlain by bedrock. Has imperfectly drained (such as, gleyed) subgroup inclusions.	1,800.9	0.9	417.6	3.3
M7	Medium-textured till	Orthic Gray Luvisol developed on medium-textured till. Soils with less pedogenic development (such as, Brunisols) have been included in this map unit if surficial material textures are similar.	2,673.7	1.4	103.9	0.8
M8	Medium-textured till over bedrock	Orthic Gray Luvisol developed on medium-textured till underlain by bedrock. Soils with less pedogenic development (such as, Brunisols) have been included in this map unit if surficial material textures are similar.	3,427.1	1.7	223.0	1.8
M9	Medium-textured till	Orthic Gleysol formed on fine-textured till material, underlain by bedrock. Has imperfectly drained (such as, gleyed) subgroup inclusions.	601.1	0.3	18.5	0.1
O1	Deep Peat (more than 100 centimetres)	Organic soils, with O horizon(s) Thicker than 100 centimetres. May include terric profiles, with peat depth 100 to 160 centimetres. Typic profiles predominantly composed of fibric material with lower prevalence of mesic material. Terric profiles more often characterized by mesic peat.	45,917.3	23.2	851.1	6.7
O2	Shallow Peat (less than 100 centimetres) over mineral material	Terric Organic profiles with veneers of organic material (less than 100 centimetres). Field results show majority of organic soils with terric layers and peat veneers are mesic in composition, with lower amounts of humic and fibric material.	76,069.6	38.4	3,956.2	31.2
R1	Consolidated Bedrock	Consolidated bedrock at surface. Little to no soil development.	1,497.2	0.8	1,075.9	8.5
ZDL	Anthropogenic	Contains evidence of human disturbance.	64.2	Less than 0.1	1.9	Less than 0.1
ZWA	Water	Waterbody.	7,458.1	3.8	41.2	0.3
Total	**-**	**-**	**197,959.8**	**100**	**12,665.3**	**100**

Figure 8.2-39: Location of Field Sites with Metal Concentrations Higher than Guidelines



8.2.8.7.3 Reclamation Suitability

Fifty-one soil samples were tested against the Northern Forest Region suitability criteria. Over 60 percent (32 out of 51) of the samples were rated as poor for reclamation suitability. For the 16 soil profiles, 1 was rated as good, 1 as fair, 11 as poor, and 3 as unsuitable. Poor or unsuitable ratings does not mean the soil cannot be used for reclamation, but it might need careful planning, good management, and possibly soil amendments to improve its suitability.

The poor ratings were mainly due to fine and very fine textures (clay and heavy clay), low pH values (less than 4.2), and high calcium carbonate content. Unsuitable ratings were given to two profiles for very low pH values (less than 3.45) and one profile for high coarse fragment content (75 percent fine gravel).

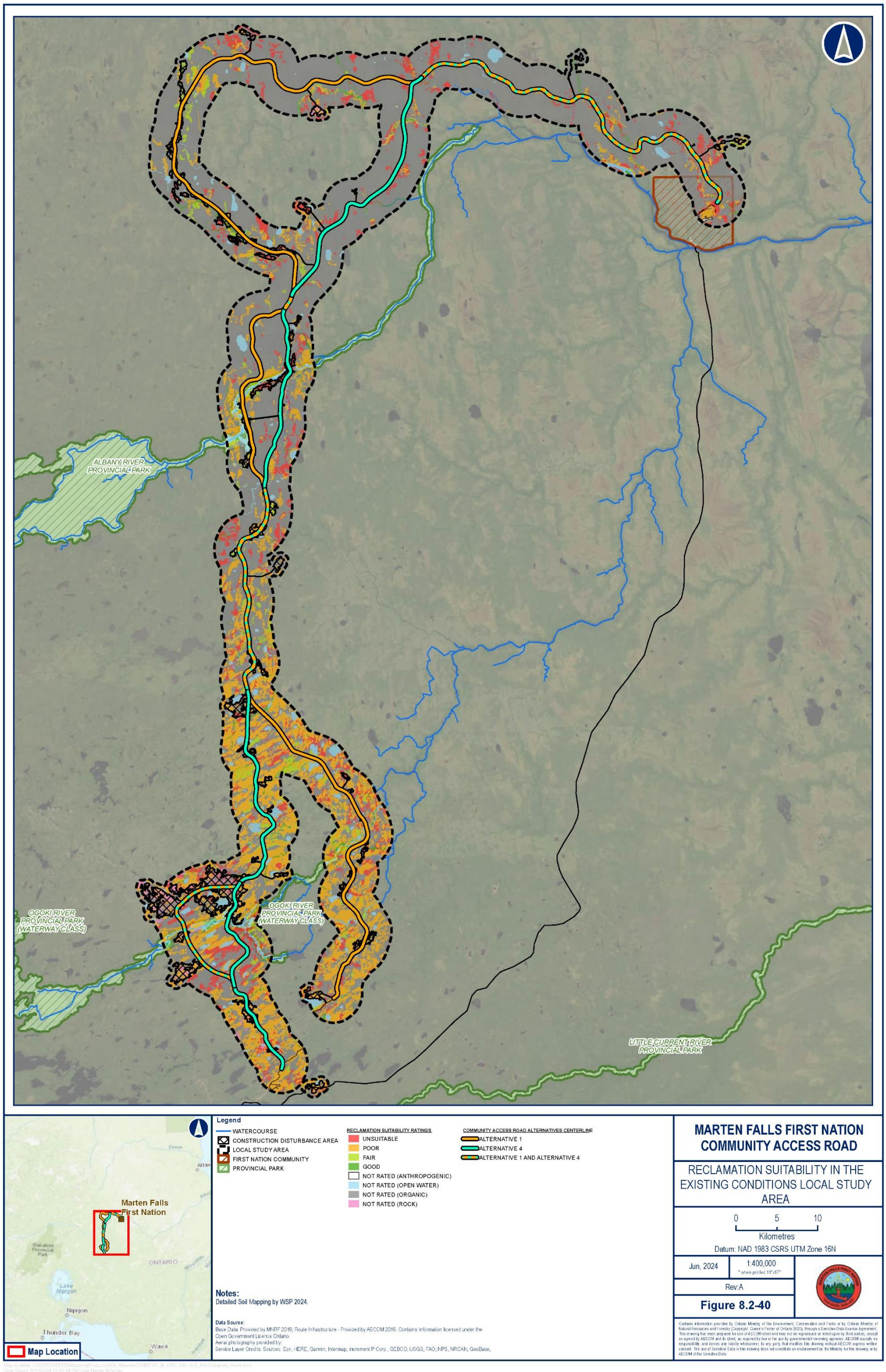
In the Local Study Area, about 8 percent of the soils were rated as unsuitable, and about 22.5 percent were rated as poor. The spatial distribution of soil reclamation suitability ratings in the Local Study Area is summarized in **Table 8.2-37** and displayed on **Figure 8.2-40**.

Table 8.2-37: Soil Reclamation Suitability Ratings in the Local Study Area and Construction Disturbance Area

Reclamation Suitability Class	Local Study Area (hectare)	Local Study Area (percent)	Construction Disturbance Area (hectare)	Construction Disturbance Area (percent)
Good	2,323.2	1.2	119.0	0.9
Fair	4,386.0	2.2	738.8	5.8
Poor	44,619.4	22.5	4,291.9	33.9
Unsuitable	15,624.8	7.9	1,589.3	12.5
Not Rated (Footnote a)	131,006.4	66.2	5,926.3	46.8
Total	**197,959.8**	**100.0**	**12,665.3**	**100.0**

Footnotes: Totals may vary slightly due to rounding.
(a) Rock (R), water (N), and Organic (O1, O2) were not rated.

Figure 8.2-40: Reclamation Suitability in the Existing Conditions Local Study Area



8.2.8.7.4 Soil Sensitivities

Wind Erosion Risk

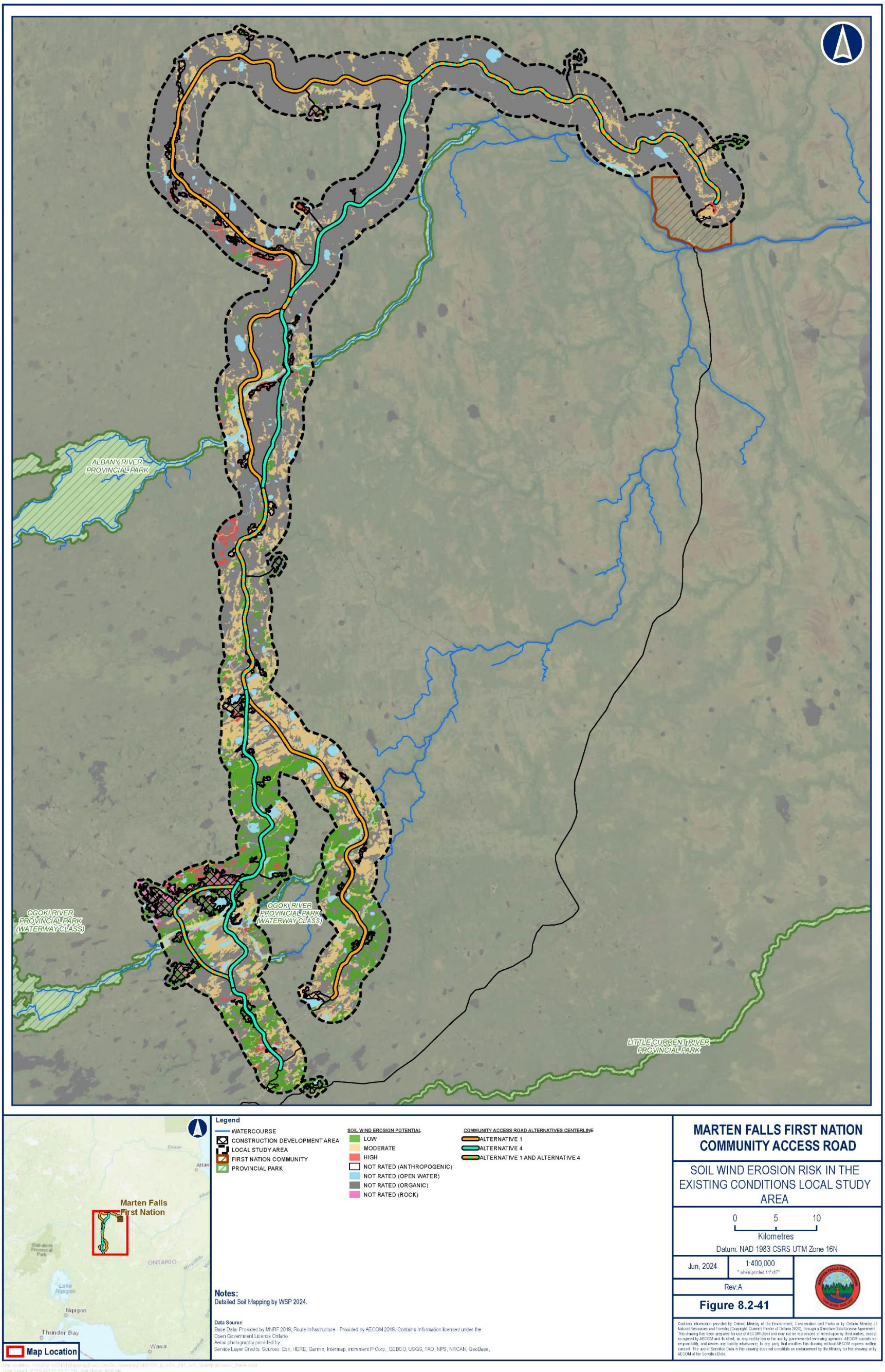
In the Local Study Area, the risk of soil being eroded by wind is mostly moderate (20.3 percent). However, in the Construction Disturbance Area, 10.5 percent of the area is at high risk for wind erosion, compared to only 1.9 percent in the rest of the Local Study Area. This higher risk is likely because the Construction Disturbance Area has sand and gravel, which are more easily eroded by wind. The spatial distribution of wind erosion risk ratings is summarized in **Table 8.2-38** and displayed on **Figure 8.2-41**.

Table 8.2-38: Wind Erosion Risk Ratings in the Local Study Area and Construction Disturbance Area

Wind Erosion Risk Class	Local Study Area (hectare)	Local Study Area (percent)	Construction Disturbance Area (hectare)	Construction Disturbance Area (percent)
Low	23,129.5	11.7	2,484.8	19.6
Moderate	40,098.6	20.3	2,922.6	23.1
High	3,725.2	1.9	1,331.6	10.5
Not rated	131,006.4	66.2	5,926.3	46.8
Total	**197,959.8**	**100.0**	**12,665.3**	**100.0**

Footnotes: Totals may vary slightly due to rounding.

Figure 8.2-41: Soil Wind Erosion Risk in the Existing Conditions Local Study Area



Water Erosion Risk

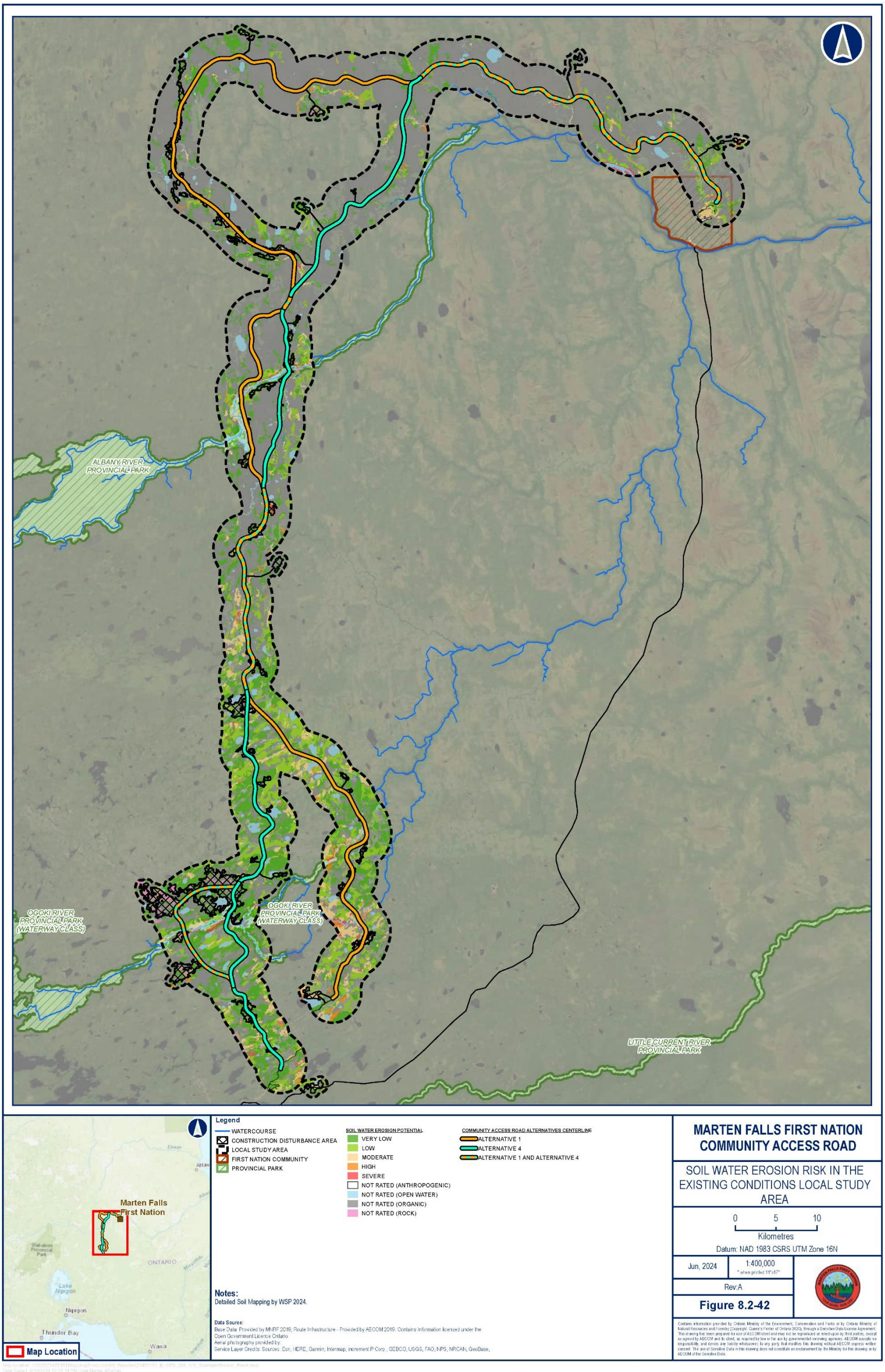
The Local Study Area is mostly flat, with some steep slopes. About 28 percent of the area has a very low or low risk of water erosion. If areas that were not rated are excluded, over 80 percent of the area has a low risk of water erosion. This is similar in the Construction Disturbance Area. Water erosion risk was not calculated for open water, rock, human-made materials, or organic soils, which make up 66.2 percent of the Local Study Area. The spatial distribution of water erosion risk ratings is summarized in **Table 8.2-39** and displayed on **Figure 8.2-42**.

Table 8.2-39: Water Erosion Risk Ratings in the Local Study Area and Construction Disturbance Area

Water Erosion Risk Class	Local Study Area (hectare)	Local Study Area (percent)	Construction Disturbance Area (hectare)	Construction Disturbance Area (percent)
Very Low	35,309.4	17.8	4,097.1	32.3
Low	20,166.5	10.2	1,371.4	10.8
Moderate	8,416.4	4.3	951.8	7.5
High	1,799.8	0.9	195.7	1.5
Severe	1,261.2	0.6	120.4	1.0
Not Rated	131,006.4	66.2	5,928.7	46.8
Total	**197,959.8**	**100.0**	**12,665.3**	**100.0**

Footnotes: Totals may vary slightly due to rounding.

Figure 8.2-42: Soil Water Erosion Risk in the Existing Conditions Local Study Area



8.2.8.7.5 Soil Sensitivity to Acidification

Soil sensitivity to acidification varies due to different textures, development, and drainage. Finer textured soils (like silty clay and clay loam) generally have low sensitivity to acidification (60 percent). Coarser textured soils (like sandy loam and loamy sand) have high or moderate sensitivity to acidification (70 percent).

Since there are few bogs or poor fens in the Local Study Area, the organic soils mapped (O1 and O2) are rated as having low sensitivity to acidic inputs.

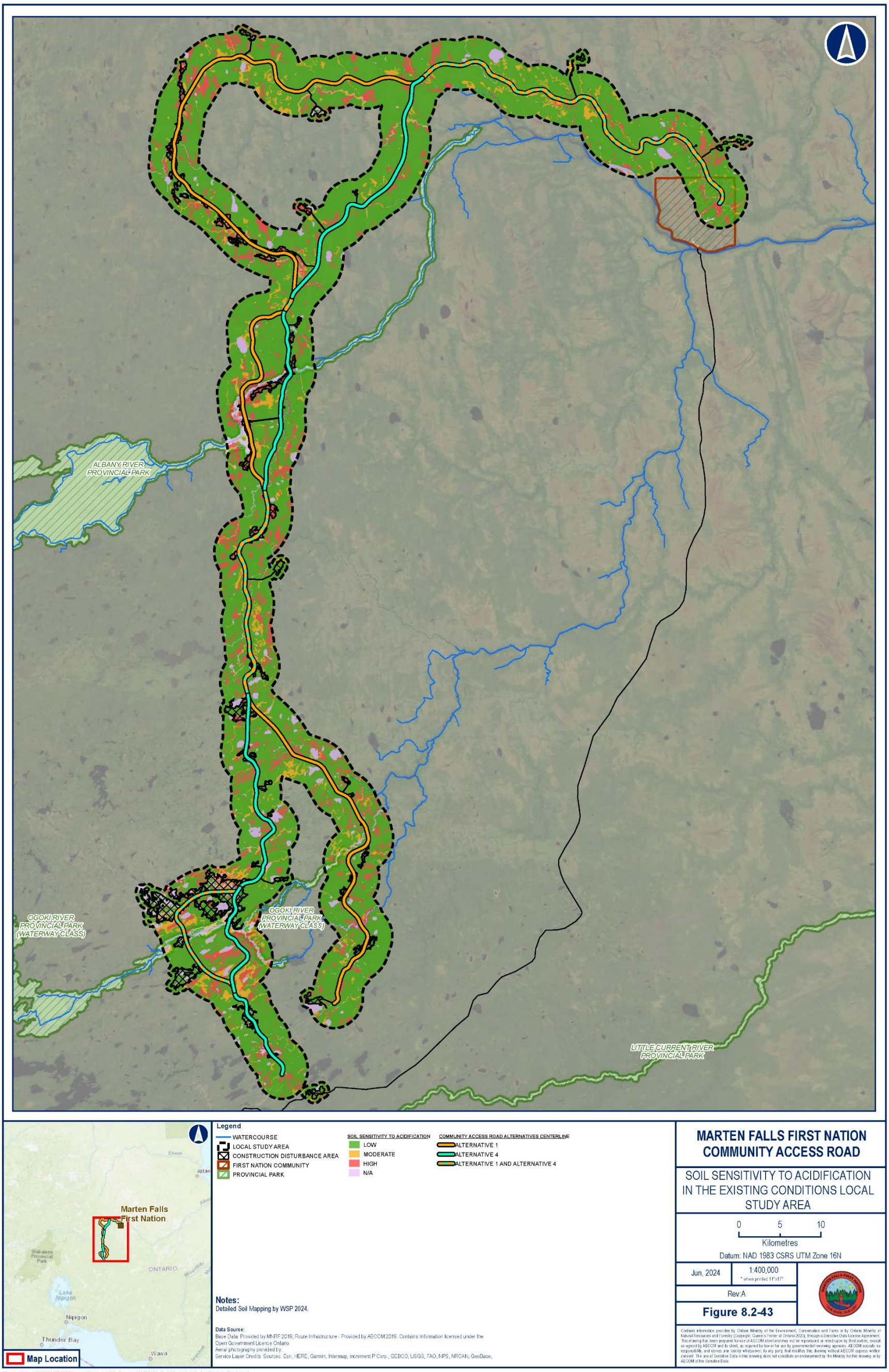
Acidification sensitivity ratings within the Local Study Area and Construction Disturbance Area are summarized in **Table 8.2-40** and shown on **Figure 8.2-43**.

Table 8.2-40: Acidification Sensitivity Ratings in the Local Study Area and Construction Disturbance Area

Sensitivity to Acidification Rating	Local Study Area (hectare)	Local Study Area (percent)	Construction Disturbance Area (hectare)	Construction Disturbance Area (percent)
Low	153,805.1	77.7	7,423.0	58.6
Moderate	12,120.0	6.1	740.3	5.8
High	23,015.1	11.6	3,383.0	26.7
Not Applicable	9,019.5	4.6	1,119.0	8.8
Total	**197,959.8**	**100.0**	**12,665.3**	**100.0**

Footnotes: Totals may vary slightly due to rounding.

Figure 8.2-43: Soil Sensitivity to Acidification in the Existing Conditions Local Study Area



8.2.8.7.6 Compaction Risk

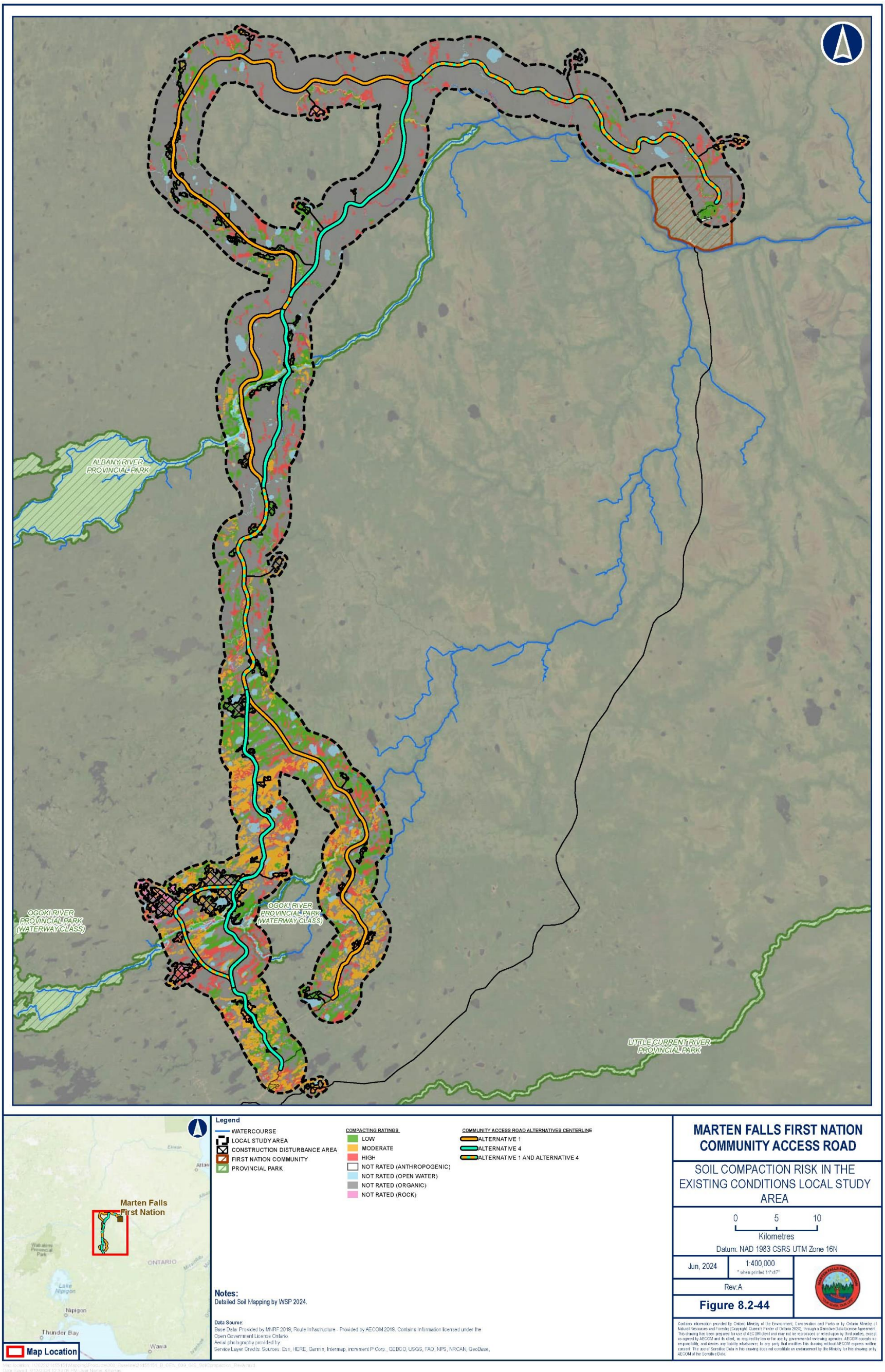
Since soil compaction risk is assigned based mainly on soil texture and soil drainage, the Local Study Area has a relatively even distribution of soils that are at a low, moderate, or high risk for compaction. Areas of organic soils have not been rated but would likely be at a high risk for compaction. Open water, rock, and previously disturbed areas in the Local Study Area were also not rated for compaction risk. Compaction risk is summarized in **Table 8.2-41** and shown on **Figure 8.2-44**.

Table 8.2-41: Soil Compaction Risk Ratings in the Local Study Area and Construction Disturbance Area

Soil Compaction Risk Class	Local Study Area (hectare)	Local Study Area (percent)	Construction Disturbance Area (hectare)	Construction Disturbance Area (percent)
Low	27,914.8	14.1	3,712.3	29.3
Moderate	19,163.6	9.7	2,023.3	16.0
High	19,874.9	10.0	1,003.4	7.9
Not rated	131,006.4	66.2	5,926.3	46.8
Total	**197,959.8**	**100.0**	**12,665.3**	**100.0**

Footnotes: Totals may vary slightly due to rounding.

Figure 8.2-44: Soil Compaction Risk in the Existing Conditions Local Study Area



8.3 People

The people of Marten Falls First Nation are deeply connected to their land and environment. Trapping, fishing, and hunting are valued and important activities for their food security and cultural heritage. Common practices of people are being challenged because of economic changes and environmental impacts. There are travel routes throughout the study areas that provide access to economic, traditional and travel activities for community members. Marten Falls First Nation values sustainable ecosystem management. They also have interests in forest management and commercial forestry. Overall, the people of Marten Falls First Nation are committed to preserving their way of life and the health of their environment for future generations. This section details the existing conditions of the aboriginal and treaty rights and interests, acoustic and vibration environment, cultural heritage and archaeology, atmospheric environment, community well-being, land and resource use, and visual environment within the Project study areas.

8.3.1 Indigenous Knowledge of People

Information provided by Indigenous Knowledge holders, recognized as such by their Indigenous community, has been collected through literature review and shared directly by Indigenous communities in support of the Community Access Road through face-to-face meetings or receipt of Indigenous Knowledge reports. The information used to inform this reporting related to the people disciplines is summarized in **Table 8.3-1**. Some information that has been provided is considered confidential. Where possible this information has been summarized at a high-level, removing any confidential details and is included in **Table 8.3-1**. Where this is not possible it has been excluded from **Table 8.3-1** and has still been considered throughout the Technical Support Documents where applicable.

Table 8.3-1: Indigenous Knowledge of People

Topic	Indigenous community	Details
• **Noise** • **Vibrations**	• Marten Falls First Nation • Aroland First Nation • Attawapiskat First Nation • Neskantaga First Nation (Footnote a)	• The locations of sensitive features were shared by Indigenous communities who provided input on the Community Access Road. The locations of these sensitive features were considered as potential points of reception in the assessment for the acoustic and vibration environment.
• **Noise** • **Vibrations**	• Marten Falls First Nation (2023b)	• Marten Falls First Nation noted concerns from the Community related to overall / generalized impacts associated with increased noise and vibrations throughout Marten Falls First Nation traditional territory. • Some of the generalized concerns shared included expected level of traffic / volume of vehicles expected to use the Community Access Road and the associated concern with noise on land use. This includes increased noise / vibrations at identified points of reception.
• **Air Quality**	• Marten Falls First Nation (2023b)	• The location of sensitive receptor types (for example, dwellings, protected areas, and areas where human activity is likely to occur such as recreation activities).
• **Cultural heritage data related to the Community Access Road**	• Marten Falls First Nation (2023b)	• Used to develop heat maps to complete the Residual Effects analysis in regard to Cultural Heritage.
• **Recreation and Tourism**	• Aroland First Nation	• Information, via literature review, pertaining to the Kenogamisis Lake / River and Goldfield Lake Areas but can interpret that these concerns would apply to the Community Access Road: – Snowmobile trails are used; – Disruptions to use of trails; and – Provide alternative access routes.
• **Trapping**	• Fort Albany First Nation	• No trapping is allowed on other traplines, via literature review.
• **Parks and Protected Areas**	• Kingfisher Lake First Nation	• Use of the Pipestone River Provincial Park waters for social and economic transportation is recognized as continuing and acceptable, via literature review.
• **Forestry Industry**	• Eabametoong First Nation	• Indicated interest in forest product opportunities, via literature review.
• **Recreation and Tourism**	• Eabametoong First Nation	• Indicated interest in recreation and tourism values, via literature review.
• **Land Use Compatibility, Remote Outfitters, Recreation and Tourism**	• Marten Falls First Nation	• Indicated areas of moose hunting and fishing areas, outfitters camp, and potential Aroland First Nation land use, via consultation field program.
• **Trapping**	• Aroland First Nation	• Provided confidential information via the Indigenous Knowledge Program regarding commercial harvesting and trapping areas with the Preferred Route.
• **Visual Environment**	• Marten Falls First Nation	• Indicated locations of various sensitive receptors throughout the visual environment study areas (in other words, the Construction Disturbance Area and Local and Regional Study Areas), including outfitter camps, recreation areas, traditional use and harvesting areas, as well as a sense of place that is connected to the wilderness nature of the lands. • Concerns were raised about the potential effects related to ability to enjoy using cabins that might have their views affected.
• **Traditional Use of Lands**	• Kashechewan First Nation	• Identified traditional use of lands surrounding Albany River Corridor and surrounding areas, as well as a sense of place that is tied to the wilderness nature of the lands, and the overall cultural identity of Kashechewan First Nation.
• **Remote Wilderness**	• Aroland First Nation	• Identified traditional use of lands within and surrounding study areas, and sense of place that is connected to the remote wilderness character of the lands.
• **Traditional Foods** • **Cultural Preservation and Change**	• Aroland First Nation	• Information from Natural Resource Management and Indigenous Food Systems in Northern Ontario (LeBlanc, 2014) was used to inform the list of traditional foods and traditional economies for this Project. Information was also included about contamination and spraying concerns to various plant species.
• **Cultural Preservation and Change**	• Marten Falls First Nation	• The Draft Community-Based Land Use Plan (Marten Falls First Nation, 2020) was used to provide information on historical and contemporary socio-economic activities, such as trapping, tanning hides, and crafting.
• **Community Infrastructure** • **Cultural Preservation and Change**	• Marten Falls First Nation	• Information received during the Community Access Road field monitoring programs informed the Project about the disruption of historical travel routes, alteration or shorelines, and fluctuating water levels due to hydroelectric development on local rivers.
• **Cultural Preservation and Change**	• Aroland First Nation	• The Understanding Traditional Food Behaviour and Food Security in Rural First Nation Communities: Implications for Food Policy report (Stroink and Nelson, 2012) was used to describe the benefits of local food harvesting practices.

Topic	Indigenous community	Details
• **Community Infrastructure** • **Cultural Preservation and Change**	• Marten Falls First Nation	• Information obtained from the Marten Falls First Nation Community Access Road Indigenous Knowledge Program was used to describe the importance of trapping, hunting, fishing, and other harvesting to the Community's way of life. Information from this program also provided insight into concerns from the Community about the potential effects of the Community Access Road on harvesting practices, including potential poaching from outsiders. The challenges to the Community's way of life due to natural and built structures on rivers was also discussed. Concerns about potential safety-related issues resulting from the Community Access Road were shared.
• **Cultural Preservation and Change**	• Eabametoong First Nation	• The press release titled Eabametoong First Nation Forced to Head to Court to Protect Homelands from Mining in Ontario (Eabametoong First Nation, 2018) was used to describe the prevalence of traditional food harvesting practices.
• **Cultural Preservation and Change**	• Mishkeegogamang First Nation	• The Stories of the Past, How We Lived report (Mishkeegogamang First Nation, 2010) was used to describe historical seasonal movements and traditional foods.
• **Cultural Preservation and Change** • **Traditional Foods**	• Constance Lake First Nation	• Indigenous Knowledge shared by Constance Lake First Nation informed the Project about historical reliance on interconnected river systems for travel and trade, sustainable harvesting practices, and cultural protocols that guide resource use. Current land use planning emphasizes tourism opportunities rooted in cultural interpretation and eco-tourism, promoting protection of sensitive habitats and sacred sites.
• **Cultural Preservation and Change** • **Traditional Foods**	• Neskantaga First Nation	• Indigenous Knowledge from Neskantaga First Nation informed the Project about historical seasonal cycles of hunting, trapping, and fishing, preservation methods such as smoking and pemmican, and the cultural significance of species like sturgeon and beaver. Current stewardship programs prioritize sturgeon conservation and express concerns about development impacts on wildlife essential to food security and cultural identity.
• **Cultural Preservation and Change** • **Traditional Foods**	• Animbiigoo Zaagi'igan Anishinaabek	• Indigenous Knowledge from Animbiigoo Zaagi'igan Anishinaabek informed the Project about seasonal harvesting practices for wildlife, fish, and plants, including the cultural and economic importance of species such as sturgeon and blueberries. Current activities like commercial fishing, berry harvesting, and trapping continue to support livelihoods while reflecting cultural values and ecological stewardship.
• **Cultural Preservation and Change** • **Traditional Foods**	• Ginoogaming First Nation	• Indigenous Knowledge from Ginoogaming First Nation informed the Project about historical practices of hunting, trapping, fishing, and plant gathering across a broad territory, as well as ongoing use of traplines for cultural and economic purposes. Community concerns highlight environmental changes and development pressures affecting wildlife health, fish quality, and plant resources, which threaten traditional practices and food security.
• **Cultural Preservation and Change** • **Traditional Foods**	• Long Lake #58 First Nation	• Indigenous Knowledge from Long Lake #58 First Nation informed the Project about historical subsistence practices including hunting, trapping, fishing, and plant harvesting, as well as preservation techniques like drying and smoking. Fur trading and adaptive trapline management were key economic activities, reflecting the integration of cultural values with resource management.
• **Community and Public Health**	• Marten Falls First Nation	• Indigenous Knowledge from Marten Falls First Nation informed the Project about concerns surrounding substance use in the community.
• **Community and Public Health**	• Aroland First Nation	• Indigenous Knowledge from Aroland First Nation informed the Project about concerns surrounding substance use in the community.
• **Access to Clean Water**	• Kashechewan First Nation	• Indigenous Knowledge from Kashechewan First Nation informed the Project about reliance on waterways for boat travel, hunting waterfowl, and trapping species such as beaver and muskrat. Community members noted declining water levels caused by upriver dams, which have affected access to hunting camps and harvesting activities, highlighting the cultural and subsistence importance of healthy water systems.
• **Access to Clean Water**	• Neskantaga First Nation	• Indigenous Knowledge from Neskantaga First Nation informed the Project about the cultural importance of interconnected waterways for seasonal travel, sustenance, and identity. Historic routes along rivers such as the Attawapiskat, Albany, and Winisk supported mobility and resource harvesting, reflecting deep ties between water systems and land-based knowledge.
• **Access to Clean Water**	• Ginoogaming First Nation	• Indigenous Knowledge from Ginoogaming First Nation informed the Project about the cultural and subsistence importance of waterways for fishing, canoe travel, and maintaining family connections. Community members reported concerns about declining water quality and fish health in Kenogamisis Lake, Kenogamisis River, and Long Lake, while emphasizing the significance of historic canoe routes and healing camps along these waterways.
• **Access to Clean Water**	• Animbiigoo Zaagi'igan Anishinaabek	• Indigenous Knowledge from Animbiigoo Zaagi'igan Anishinaabek informed the Project about reliance on local waterbodies such as Kenogamisis Lake and River for drinking water and fishing. Elders noted direct consumption from Kenogamisis Lake and emphasized the importance of protecting habitats and spawning areas, particularly in Goldfield Creek, due to the cultural and economic significance of fishing.
• **Traditional Foods**	• Fort Albany First Nation	• Indigenous Knowledge from Fort Albany First Nation informed the Project about the cultural and nutritional importance of traditional foods, including hunting waterfowl such as Canada Geese, trapping species like beaver and muskrat, and harvesting moose and caribou. Fishing for Sturgeon, Whitefish, Walleye, and other species, along with gathering berries and medicinal plants, reflects practices that sustain food security and cultural identity.
• **Traditional Foods**	• Attawapiskat First Nation	• Indigenous Knowledge from Attawapiskat First Nation informed the Project about seasonal cycles of traditional food harvesting, including spring goose and duck hunts, muskrat hunting, summer fishing for whitefish, and fall caribou and moose harvests. Winter trapping of beaver, muskrat, and rabbit provided both food and trade opportunities, reflecting practices that sustain cultural identity and food security.

Topic	Indigenous community	Details
• **Traditional Foods**	• Eabametoong First Nation	• Indigenous Knowledge from Eabametoong First Nation informed the Project about seasonal harvesting practices, including hunting moose and geese, fishing for Sturgeon, Walleye, and Whitefish, and gathering berries, wild rice, and medicinal plants. These activities continue to sustain food security and cultural identity, reflecting deep connections to the land and water.
• **Traditional Foods**	• Kasabonika Lake First Nation	• Indigenous Knowledge from Kasabonika Lake First Nation informed the Project about communal systems of hunting and trapping organized under Elders' guidance, seasonal harvesting of moose, caribou, and waterfowl, and women's central role in processing and preparing traditional foods.
• **Traditional Foods**	• Kitchenuhmaykoosib Inninuwug First Nation	• Indigenous Knowledge from Kitchenuhmaykoosib Inninuwug First Nation informed the Project about the cultural and subsistence importance of caribou hunting and the need to maintain migration routes to protect access to this resource. Elders emphasized that disruptions to caribou habitat would impact traditional harvesting practices and cultural continuity for future generations.
• **Traditional Foods**	• Kingfisher Lake First Nation	• Indigenous Knowledge from Kingfisher Lake First Nation informed the Project about the cultural and subsistence importance of Boreal Caribou and the role of hunting and trapping in sustaining food systems. Elders described historic protocols for inter-community cooperation when hunting across territories, reflecting values of respect and social agreements that supported traditional harvesting practices.
• **Traditional Foods**	• Mishkeegogamang First Nation	• Indigenous Knowledge from Mishkeegogamang First Nation informed the Project about seasonal harvesting practices, including hunting moose and beaver, fishing for Sturgeon, Walleye, and Whitefish, and gathering berries and wild rice, as well as preservation methods.
• **Traditional Foods**	• Nibinamik First Nation	• Indigenous Knowledge from Nibinamik First Nation informed the Project about seasonal harvesting practices, including hunting moose, caribou, rabbits, and waterfowl, as well as fishing and food preservation methods like smoking and drying. These practices are rooted in spiritual values and mobility along traditional canoe routes, reflecting a deep connection to the land and sustaining cultural identity.
• **Traditional Foods**	• Kashechewan First Nation	• Indigenous Knowledge from Kashechewan First Nation informed the Project about seasonal harvesting practices, including spring hunts for ducks and waterfowl, fall hunting for moose and caribou, summer fishing for species such as Northern Pike, Walleye, Sturgeon, and Whitefish, and winter trapping of beaver, marten, and other furbearers. These activities support food security and cultural continuity through sharing and community-based practices.
• **Traditional Foods**	• Wapekeka First Nation	• Indigenous Knowledge from Wapekeka First Nation informed the Project about seasonal harvesting practices, including hunting moose and beaver in winter, geese in spring and fall, and caribou during migration periods. Fishing for species such as Walleye, Northern Pike, Whitefish, Trout, Sturgeon, and gathering berries like blueberries and cloudberries remain important for food security and cultural continuity.
• **Traditional Foods**	• Webequie First Nation	• Indigenous Knowledge from Webequie First Nation informed the Project about seasonal harvesting practices, including spring and fall hunts for geese, ducks, and moose, as well as trapping and fishing. Elders described resourceful use of harvested animals.
• **Traditional Foods**	• Weenusk First Nation	• Indigenous Knowledge from Weenusk First Nation informed the Project about the cultural and subsistence importance of caribou, moose, fish, and geese, with caribou harvested year-round and moose primarily in the fall. Seasonal fishing, including summer and winter ice fishing, and community sharing practices reflect stewardship values that sustain food security and cultural continuity.
• **Traditional Foods**	• Wunnumin Lake First Nation	• Indigenous Knowledge from Wunnumin Lake First Nation informed the Project about the cultural and subsistence importance of Boreal Caribou and moose hunting, as well as family-based land use systems that organized resource harvesting. Elders described intergenerational practices such as children assisting with bird hunting and fish net gathering, reflecting deep ties to the land and continuity of Indigenous Knowledge.
• **Public Safety**	• Aroland First Nation	• Information obtained from Aroland First Nation during the Indigenous Knowledge Program noted concerns around increased traffic due to the Community Access Road, including road safety. The community noted concerns about safety of community members with increased access to the area from outsiders.

Footnotes: (a) Marten Falls First Nation, no date (a), 2017b, 2019b, 2022a, 2022b, 2023c.

8.3.2 Valued Components of People

Valued components for each discipline are an element of the environment deemed important by Indigenous peoples, the public, stakeholders, or regulatory bodies. **Section 6.3** describes the valued components that were selected based on information provided by Regulators, through field studies, and incorporation of Indigenous Knowledge. These components can include physical, biological, cultural, or socio-economic aspects of the environment that might be impacted by a proposed project. The valued components, indicators and why they were selected for the people disciplines are provided in **Table 8.3-2**.

Table 8.3-2: Valued Components of People

Discipline	Valued Component	Indicators	Rationale for Selection	Measure of Change
• **Aboriginal and / or Treaty Rights and Interests**	• Indigenous Current Use of Lands and Resources for Traditional Purposes	• Loss of or change to sites and areas used for traditional purposes.	• Project-related disturbance to or loss of sites and areas used for traditional purposes (harvesting and / or other cultural practices) can interfere with the ability to exercise harvesting and cultural practice rights. • Indicator of importance to Indigenous communities based on the literature review undertaken as part of the Indigenous Knowledge Program, and inputs to date through the Indigenous Knowledge and Consultation and Engagement programs.	• Overlap / intersection of Project Study Area with harvesting sites and areas reported by Indigenous communities and groups. • Overlap / intersection of Project Study Area with cultural, spiritual, and / or historical sites and areas (including habitation, burial, ceremonial, sacred, meeting, teaching, and place name) reported by Indigenous communities and groups. • Changes to known or potential archaeological sites.
• **Aboriginal and / or Treaty Rights and Interests**	• Indigenous Current Use of Lands and Resources for Traditional Purposes	• Changes in the availability of resources harvested for traditional purposes.	• Indigenous land and resource use and the exercise of harvesting and cultural practice rights depends on availability of natural resources, quality of resources harvested, and changes in access to sites for traditional purposes. • Indicator of importance to Indigenous communities based on the literature review undertaken as part of the Indigenous Knowledge Program, and inputs to date through the Indigenous Knowledge and Consultation and Engagement programs.	• Changes to the availability of ungulates (caribou and / or moose). • Changes to the availability of furbearers and birds that are harvested for traditional purposes. • Changes to the availability of fish that are harvested for traditional purposes. • Changes to availability of traditional use plants.
• **Aboriginal and / or Treaty Rights and Interests**	• Indigenous Current Use of Lands and Resources for Traditional Purposes	• Changes in quality of resources harvested for traditional purposes.	• Indigenous land and resource use and the exercise of harvesting and cultural practice rights depend on confidence in the quality of natural resources used for traditional purposes. • Indicator of importance to Indigenous communities based on the literature review undertaken as part of the Indigenous Knowledge Program, and inputs to date through the Indigenous Knowledge and Consultation and Engagement programs.	• Changes in the quality of country foods. • Changes in the perception of quality of country foods.
• **Aboriginal and / or Treaty Rights and Interests**	• Indigenous Current Use of Lands and Resources for Traditional Purposes	• Changes in access to sites and areas used for traditional purposes.	• Indigenous land and resource use and the exercise of harvesting and cultural practice rights depend on access to sites and areas used for traditional purposes. • Indicator of importance to Indigenous communities based on the literature review undertaken as part of the Indigenous Knowledge Program, and inputs to date through the Indigenous Knowledge and Consultation and Engagement programs.	• Changes in access to sites and areas used for traditional purposes (for example, changes in waterway navigability, impediments to access).
• **Aboriginal and / or Treaty Rights and Interests**	• Cultural Continuity and Well-being	• Changes in the experience of being on the land.	• Cultural continuity and well-being depend on a continued sense of remoteness and experience of being on the land free from disturbance. • Indicator of importance to Indigenous communities based on the literature review undertaken as part of the Indigenous Knowledge Program and inputs to date through the Indigenous Knowledge and Consultation and Engagement programs.	• Changes in the noise environment. • Changes in the visual environment. • Changes in air quality.

Discipline	Valued Component	Indicators	Rationale for Selection	Measure of Change
• **Aboriginal and / or Treaty Rights and Interests**	• Cultural Continuity and Well-being	• Changes to connection to the land and ability to practice and transmit cultural traditions.	• Cultural continuity and well-being depend on the ability to continue to connect to the land (which is tied to histories, stories, ancestors, and cultural traditions), and to practice and transmit cultural traditions to the next generations. • Indicator of importance to Indigenous communities based on the literature review undertaken as part of the Indigenous Knowledge Program, and inputs to date through the Indigenous Knowledge and Consultation and Engagement programs.	• Changes in the availability of resources harvested for traditional purposes. • Changes in the ability to access and use preferred harvesting areas, camps, cabins, and ancestral locations (previously documented archaeological sites, historical family or village sites, and traditional gathering areas and meeting places). • Changes in ability to practice cultural traditions in the preferred way (preferred resources and methods in the preferred time of year). • Changes in ability to access and use important teaching sites and areas, including place names and sites and areas of importance based on oral history / stories / legends.
• **Aboriginal and / or Treaty Rights and Interests**	• Cultural Continuity and Well-being	• Changes in ability to exercise governance and stewardship rights.	• Cultural continuity and well-being depend on the ability to exercise governance and stewardship rights. • Indicator of importance to Indigenous communities based on the literature review undertaken as part of the Indigenous Knowledge Program, and inputs to date through the Indigenous Knowledge and Consultation and Engagement programs.	• Consistency with Community-Based Land Use Plans, where applicable. • Changes in decision-making authority on traditional lands.
• **Acoustic and Vibration**	• Noise	• Continuous 1-hour equivalent sound level • Maximum nighttime sound level • Day-night sound level • Daytime sound level • Nighttime sound level • Percent highly annoyed	• Field investigations. • Agency feedback. • Data from previous Environmental Assessments. • Environmental Noise Guideline – Stationery and Transportation Sources – Approval and Planning, (Publication NPC-300; Ontario Ministry of the Environment, 2013). • Environmental Guide for Noise (Ministry of Transportation Ontario, 2022). • A Protocol for Dealing with Noise Concerns During the Preparation, Review, and Evaluation of Provincial Highways Environmental Assessments (Ministry of Environment and Ministry of Transportation, 1986). • Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise (Health Canada, 2023) • Guidelines for Community Noise (World Health Organization, 1999). • Transit Noise and Vibration Impact Assessment Manual (Volpe, 2018). • General Specification Standard for the Use of Explosives (OPSS.PROV 120; Ontario Provincial Standard Specification, 2014). • Model Municipal Noise Control By-Law, NPC-100 (Environment Ontario, 1978).	• Change in sound levels. • Change in percent highly annoyed.

Discipline	Valued Component	Indicators	Rationale for Selection	Measure of Change
• **Acoustic and Vibration**	• Vibration	• Peak particle ground vibration velocity • Root-mean square ground vibration velocity • Air overpressure	• Field investigations. • Agency feedback. • Data from previous Environmental Assessments. • Environmental Noise Guideline – Stationery and Transportation Sources – Approval and Planning, (Publication NPC-300; Ontario Ministry of the Environment, 2013). • Environmental Guide for Noise (Ministry of Transportation Ontario, 2022). • A Protocol for Dealing with Noise Concerns During the Preparation, Review, and Evaluation of Provincial Highways Environmental Assessments (Ministry of Environment and Ministry of Transportation, 1986). • Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise (Health Canada, 2023) • Guidelines for Community Noise (World Health Organization, 1999). • Transit Noise and Vibration Impact Assessment Manual (Volpe, 2018). • General Specification Standard for the Use of Explosives (OPSS.PROV 120; Ontario Provincial Standard Specification, 2014). • Model Municipal Noise Control By-Law, NPC-100 (Environment Ontario, 1978)	• Change in peak particle ground vibration velocity. • Change in root-mean square ground vibration velocity. • Change in air overpressure.
• **Cultural Heritage**	• Cultural Heritage	• Culturally Significant Landscapes	• Areas of importance to local communities. • Areas of Historical (Regional) Significance (for example, historic lumber routes). • Culturally Important Landscape Features (for example, related to traditional hunting / harvesting area, portage routes) • Areas of Religious or Spiritual Significance (material and non-material). • Locations related to Oral histories. • Indigenous Knowledge. • Recent and historical maps of the study area. • Primary and secondary documentary sources (both current and archival written accounts, maps, drawings, plans and images). • Site visits. • Community-Based Land Use Plan initiatives.	• No measures identified.

Discipline	Valued Component	Indicators	Rationale for Selection	Measure of Change
• **Cultural Heritage**	• Archaeology	• Previously identified archaeological sites • Proximity to water • Soil texture and drainage • Glacial geomorphology, elevated topography • Resource areas including food or medicinal plants, scarce raw materials • Areas of early 19th century settlement and transportation routes • Properties that local histories or informants have identified with possible archaeological sites, historical events, activities or occupants	• Retains high archaeological potential because of: – Burial Sites – Historical Villages – Areas of Cultural Significance (material and non-material) – Culturally Important Landscape Features (for example, related to traditional hunting / harvesting area, portage routes) – Registered archaeological sites – Areas of importance to local communities – Locations related to Oral histories – Indigenous Knowledge – Recent and historical maps of the study area – Primary and secondary documentary sources (both current and archival written accounts, maps, drawings, plans and images) – Site visits – Community-Based Land Use Plan initiatives	• No measures identified.
• **Atmospheric Environment**	• Air Quality • Greenhouse Gases	• Change in concentration of Air Contaminants: – Total nitrogen oxides – Carbon monoxide – Sulphur dioxide – Total Suspended Particulate – Particulate matter smaller than 10 micrometres in diameter – Particulate matter smaller than 2.5 micrometres in diameter – Selected Volatile Organic Compounds (acrolein, acetaldehyde, benzene, formaldehyde, 1,3-butadiene, toluene, ethylbenzene, and xylene) – Polycyclic aromatic hydrocarbons (benzo(a)pyrene)	• The contaminants chosen for the indicators are based on those commonly associated with transportation and construction activities, as prescribed by the Ontario Ministry of Transportation operator (Ministry of Transportation, 2020).	• Predicted air quality concentrations.
• **Land and Resource Use**	• Land Use Compatibility	• Land use compatibility – Binary alignment with established planning policy requirements	• The Community Access Road should be compatible with existing land use designations within the Construction Disturbance Area as much as possible. Alternatively, amendment processes will be noted and addressed.	• Change will be measured against whether the alternative road segments align or are consistent with existing planning policies and legislation. Alternative road segments that align with existing planning policies will be considered to be more favourable than those alternative road segments that are less aligned or consistent with planning policies.
• **Land and Resource Use**	• Parks and Protected Areas	• Area of park and protected areas impacted – Area of park and protected area with natural, cultural or recreational values impacted.	• Provincial parks, dedicated protected areas, and protected areas are regulated in Ontario for their preservation of these values. Consideration of potentially effected values will include physical, social, and natural science considerations in relation to these values.	• Change will be measured against the extent to which the Community Access Road (alternative route segments) results in impact to areas of cultural, natural, or recreational values within parks and protected areas. Route segments with a greater area of impact will be viewed less favourably than road segments with less area of impact.

Discipline	Valued Component	Indicators	Rationale for Selection	Measure of Change
• **Land and Resource Use**	• Parks and Protected Areas	• Land and waterway disruption and access – Change to access to land utilized for recreation and / or tourism. – Disruption (temporary or permanent) of lands and waterways used for recreation.	• Recreation and tourism are important for community well-being and economic opportunity within the Project Study Area. The Project has the potential to disrupt existing recreation and tourism land, and waterway uses and generate new access opportunities within the Project Study Area.	• Change will be measured against the extent to which recreation and tourism activities are impacted. Both positive and negative changes to recreation and tourism are possible. For example, improved access to remote areas may negatively impact remote tourism as this could change the remote experience and / or the demand for back country camping sites. Alternatively, improved access to the lands / waterways could result in a greater number of people using the land for recreation / tourism purposes which would be viewed as a positive change. Finally, the Community Access Road could impact the navigability of waterways and change boat (canoe) travel through the area.
• **Land and Resource Use**	• Parks and Protected Areas	• Accessibility to parks and protected areas – Change in access to lands within Parks and protected areas used for recreation purposes	• Provincial parks, Dedicated protected areas, and protected areas are regulated in Ontario for their preservation of these values. Consideration of potentially effected values will include physical, social, and natural science considerations in relation to these values.	• Change will be measured against the extent to which access to Parks and protected areas is increased as a result of the road. This may be considered to be both a positive and negative impact as indicated above. The road could increase access and result in greater use of the park for recreation. The increase in access could also be viewed negatively if it impacts the remote character of the park which may be valued by some users.
• **Land and Resource Use**	• Recreation and Tourism	• Land and waterway disruption and access – Change to access to land utilized for recreation and / or tourism. – Disruption (temporary or permanent) of lands and waterways used for recreation.	• Recreation and tourism are important for traditional use of lands and socio-economic opportunity within the Community Access Road area. The Community Access Road has the potential to disrupt existing recreation and tourism land, and waterway uses and generate new access opportunities within the Project study areas.	• Change will be measured against the extent to which recreation and tourism activities are impacted. Both positive and negative changes to recreation and tourism are possible. For example, improved access to remote areas may negatively impact the remote tourism as this could change the remote experience and / or the demand for outfitter services. Alternatively, improved access to the lands / waterways could result in a greater number of people using the land for recreation / tourism purposes which would be viewed as a positive change. Finally, the Community Access Road could impact the navigability of waterways and change boat (canoe) travel through the area.
• **Land and Resource Use**	• Recreation and Tourism	• Environmental Conditions – Change to environmental conditions including atmospheric environment, acoustic environment, surface water, vegetation, fish and fish habitat, wildlife, and visual aesthetics	• Recreation and tourism rely on a distinct environmental setting including a remote and wilderness character. The Community Access Road may change the environmental conditions in recreation and tourism areas.	• Recreation and tourism activity in the Local Study Area is largely outdoor oriented and related to the natural environment character of the area. Change to environmental conditions as a result of road development (for example, potential impacts to moose and fish populations, and noise) could lead to a reduced attractiveness of the area for recreation and tourism activity. The level of change to the attractiveness of the area for recreation and tourism will be dependent on the level of change of environmental conditions determined by other disciplines.

Discipline	Valued Component	Indicators	Rationale for Selection	Measure of Change
• **Land and Resource Use**	• Recreation and Tourism	• Availability of species harvested for recreation purposes – Change to target species populations harvested for recreation purposes, including species identified in the fish and fish habitat and wildlife Study Plans – Change to the habitat for these target species – Additional hunting and fishing pressures for target species	• Many recreation and tourism activities involve resource harvesting such as fishing and hunting. Changes to the availability of target species may impact the recreation and tourism environment. • Availability of access could bring additional hunters and anglers which could increase pressures on fish and wild game populations. • Lack of monitoring for poaching in the remote area could also result in illegal harvesting of species such as moose or sturgeon.	• A decrease in the population of targeted harvested species could reduce recreation and tourism activity in the Local Study Area. The level of change to recreation and tourism will be dependent on the projected changes to the population and habitat of the targeted species as determined by other disciplines. • A decrease in the population of harvested species could also reduce the number of species harvested by Indigenous communities, impacting traditional harvesting practices.
• **Land and Resource Use**	• Extractive Resource Industry	• Removal of lands with potential for mineral extraction – Area of land under mineral mining claims that the road segments pass through	• The Community Access Road will require lands to be withdrawn of mining rights and will physically remove lands with the potential for extraction activities. In addition, changes to land use near the Project may alter access to existing extractive features.	• There are no operating mines in the Local Study Area, so the assessment is focused on the existing mining claims and potential for future mine development. • The development of a road on lands will withdraw (remove) mining claims in the Construction Disturbance Area and would not allow claim holders to conduct any exploratory works in the area. This would mean the mining rights are no longer with the mining holder and could limit how the remaining mineral deposit could be developed for extraction. Change will be measured against the extent to which the road segment and aggregate development passes through lands covered by mining claim. The road segments that pass through the least amount of mineral claim lands are preferred.
• **Land and Resource Use**	• Extractive Resource Industry	• Proximity to and access to lands with future potential for mining development – Change to access to extractive land features	• The Community Access Road has the potential to create access to existing mining claims or future extractive features.	• Change will be measured on the extent to which the road segment increases access to lands either under mining claims or proposed for mining development. Road segments that improve access to a greater area of land under mine claim will be preferred.
• **Land and Resource Use**	• Forestry Industry	• Removal of commercial forestry lands – Areas of the Ogoki Forest that the road segment (Painter Lake Road) will pass through	• Forestry has an important role in the Northern Ontario economy and requires the use of large areas of land (divided into Forest Management Units) with planning considerations. The Community Access Road has the potential to physically remove land within the Forest Management Unit. In addition, changes to land use near the Community Access Road may alter access to future forestry operations.	• Change will be measured on the basis of the amount of commercial forestry lands that the road segments pass through. The segments that pass through the least amount of commercial forest stands will be preferred.
• **Land and Resource Use**	• Forestry Industry	• Proximity to and access to lands with potential for forestry operations and harvesting – Change to access to harvest blocks – Change to access of forestry area due to habitat (for example caribou fragmentation)	• The Community Access Road has the potential to physically remove land within the Forestry Management Unit. In addition, change to land use near the Community Access Road may alter habitat.	• Change will be measured on the extent to which the road segment increases access to lands that contain identified harvest blocks. Road segments that improve access to a greater area of commercial timber lands will be preferred. Also, to be considered, is the potential for the road to result in wildlife habitat fragmentation which could put restrictions on timber harvesting.

Discipline	Valued Component	Indicators	Rationale for Selection	Measure of Change
• **Land and Resource Use**	• Remote Outfitters	• Change to operations of remote outfitters in vicinity of the Community Access Road – Disruption (noise, air quality, visual) to the outfitters area of operations and resulting change in enjoyment by guests and attractiveness of the outfitter – Change on wildlife and fish populations – Change to the remoteness of the area as a result of new road access and change to guest experience / attractiveness of the outfitters camp	• The Community Access Road has the potential to physically remove land areas with the potential for remote outfitters operations. In addition, changes to land use near the Community Access Road may alter access and enjoyment of existing outfitter operations.	• Change will be measured against the extent to which remote outfitters are impacted. Road segments that cause the least amount of disruption (for example, noise) or pressure to game species populations will be preferred. • Reduction in key game species such as moose and certain fish species that could impact the attractiveness of the outfitter. • As a result of new access to the area, the lands used by the outfitter may feel less remote to people and affect the desirability of the outfitter. There could also be increased hunting and fishing pressure as a result of new access which again could reduce the attractiveness of the outfitter to people.
• **Land and Resource Use**	• Trapping and Harvesting (hunting and fishing)	• Change to trapping activity in vicinity of Community Access Road – Change in populations of harvested furbearing species. – Disruption effects to habitat of furbearing species in the vicinity of the Project. – Change in access to lands for trapping.	• The Community Access Road has the potential to physically remove land areas with the potential for trapping. In addition, changes to land use near the Community Access Road may alter access to existing trapping uses.	• Change will be measured against the extent to which trapping activity is impacted. Reduction in key furbearing species could impact the value of the study area for trapping. • This could reduce the number of animal harvested and / or require the trapper to go to other locations which may be considered less accessible and result in higher costs to obtain the pelts. • Improved access to the land through the road could reduce the time and cost to access the lands for trapping and therefore increasing the attractiveness of some traplines.
• **Land and Resource Use**	• Energy and Linear Infrastructure	• Opportunity for development of energy facilities and linear infrastructure – Change in access or opportunity for new energy development and / or linear facilities	• The Community Access Road has the potential to create a corridor with the potential for energy infrastructure or existing linear infrastructure activities. In addition, changes to land use near the Community Access Road may alter access to existing features.	• Change will be measured on the extent to which the road segments increase access or opportunity to develop new energy facilities and / or linear facilities. The road segments that provide the greatest new opportunity for development will be preferred.
• **Community Well-Being**	• Sustainable Population Growth	• Age distribution within the community	• To understand the overall demographic of the community.	• Percentage of youth, working aged adults, and seniors (65 yrs plus) living in the community.
• **Community Well-Being**	• Sustainable Population Growth	• Gender distribution within the community	• To understand the balance in gender distribution.	• The percentage of male and female residents in community.
• **Community Well-Being**	• Sustainable Population Growth	• Change in community population	• To provide insight into migration patterns and shifts in community composition.	• Community population (for example on reserve, or in municipality).
• **Community Well-Being**	• Labour Market Dynamics	• Labour force	• Employment and unemployment rates are essential measures of labour market health. Breaking them down by gender allows for understanding of disparities and identification of barriers to employment in the community.	• Employment, unemployment and participation rates by male / female.
• **Community Well-Being**	• Labour Market Dynamics	• Earnings	• Assessing income by gender helps identify economic disparities and it can help identify mechanisms to support development project benefits for all genders. Gender-disaggregated income data can highlight inequalities and inform targeted interventions to promote gender equality and economic empowerment.	• Income by male / female.
• **Community Well-Being**	• Labour Market Dynamics	• Educational attainment	• Educational attainment directly impacts work force development and community capacity, and differential impacts by gender.	• Education levels by male / female.

Discipline	Valued Component	Indicators	Rationale for Selection	Measure of Change
• **Community Well-Being**	• Economy	• Local businesses and commercial activities	• This will measure the vitality and growth of the local economy highlighting how active and diverse local businesses are and tracking entrepreneurial activity over time.	• Number and diversity of businesses operating in the community.
• **Community Well-Being**	• Economy	• Public finances	• This provides a snapshot of the community's fiscal health, including revenues, expenditures, and general financial stability. Understanding financial trends is key for assessing whether the community has the resources needed for sustainability and growth. • The financial well-being of the community is affected by the direct, indirect, and induced effects on regional and national finances, especially if the community relies on government transfers or is a key economic driver in the region.	• Change in community's financial reserves or debts. • Impact on federal, provincial, local, and Indigenous public finances.
• **Community Well-Being**	• Economy	• Regional economy	• This offers a broader perspective of the economic environment in which the community operates. By examining the regional economy, you can assess how local factors fit within larger economic trends, including development plans and industry shifts.	• Real Gross Domestic Product. • Employment. • Housing starts (singles and multiples). • Consumer Price Index. • Major investments in the region.
• **Community Well-Being**	• Community Access to Infrastructure and Services	• Method of transportation in and out of the community	• Changing from winter-road-only access to year-round, all-season road access will significantly increase transportation into and out of community.	• Method of transportation (for example road, airport, navigable waters)
• **Community Well-Being**	• Community Access to Infrastructure and Services	• Essential infrastructure and services	• Local infrastructure and services can support community needs during and after construction.	• Infrastructure and services capacity (for example, water, wastewater treatment plans, waste management services, power, education)
• **Community Well-Being**	• Housing	• Amount of suitable, housing within the community.	• Suitable housing is measured and can be compared over time and can be a proxy for housing demand.	• Percentage of suitable homes.
• **Community Well-Being**	• Housing	• Amount of adequate housing within the community.	• Adequate housing is measured and can be compared over time and can be a proxy for housing demand.	• Percentage of adequate homes (not requiring major repair).
• **Community Well-Being**	• Housing	• Accessibility of home building materials	• Road access will decrease costs and time associated with acquiring building materials for repair or new construction, which may enable improved housing conditions.	• Availability for shipping building material (for example, change in the number of days material can be shipped).
• **Community Well-Being**	• Cultural Preservation and Change	• Traditional economy	• This measures the level of active engagement in traditional economic practices, which are often tied to cultural identity, community well-being, and food sovereignty.	• Qualitative assessment to understand the population engaged in subsistence activities (hunting, fishing, gathering).
• **Community Well-Being**	• Cultural Preservation and Change	• Participation in community cultural activities	• Cultural activities play a vital role in preserving the community's identity and passing down traditions to future generations. Participation will help assess how active the community is in maintaining its cultural heritage.	• Qualitative assessment to understand participation in cultural activities in the community.
• **Community Well-Being**	• Cultural Preservation and Change	• Use of Traditional language	• Language is a core element of cultural preservation. Tracking the use of Cree over time will show how the community's language practices are evolving, especially given the importance of language revitalization efforts.	• Change of Indigenous language use, for three census years to understand who speaks the language, by age and male / female.
• **Community Well-Being**	• Community and Public Health	• Access to health programs and services	• Improved road access can improve timely and consistent access to health services.	• Ability to access health services and facilities.
• **Community Well-Being**	• Community and Public Health	• Recreation	• Recreation, organized or informal, contributes to physical and mental well-being.	• Access to more recreational programs.

Discipline	Valued Component	Indicators	Rationale for Selection	Measure of Change
• **Community Well-Being**	• Community and Public Health	• Mental health and well-being	• Road access may reduce barriers to mental health resources. improve connectivity and reduce isolation. Alterations to landscape can increase feelings of distress.	• Available mental health resources.
• **Community Well-Being**	• Community and Public Health	• Substance Use	• Identified as a key community concern; Improved road access may influence the availability of illicit substances.	• Access to substance use supports.
• **Community Well-Being**	• Access to Clean Water	• Access to clean water	• Improved infrastructure can increase water delivery reliability and efficiency and support repair and maintenance to the water treatment plant.	• Change in access to clean water.
• **Community Well-Being**	• Access to Clean Water	• Quality of surface water (drinking water and recreational water)	• Potential for contamination of drinking water sources and water used recreationally due to construction and operations activities. • Potential for improved maintenance and operation of the water treatment facility to allow for improved municipal water quality through access to licenced trained technicians, parts and equipment, and laboratory analysis.	• Compare concentrations of contamination in drinking and recreational water from an existing conditions assessment to concentrations predicted through modelling and / or measured during monitoring.
• **Community Well-Being**	• Traditional Foods	• Accessibility of traditional foods	• A Community Access Road could either enhance or hinder access to traditional food harvesting areas depending on infrastructure and vehicle access.	• Ability to access locations for trapping, hunting, and gathering.
• **Community Well-Being**	• Traditional Foods	• Availability of traditional foods	• Traditional food availability could change due to habitat disturbance, or increased harvesting pressure.	• Availability of traditional foods along the corridor.
• **Community Well-Being**	• Traditional Foods	• Reliance on non-traditional (store-bought) foods	• A Community Access Road may increase the volume and diversity of store-bought foods at lower prices, given road access versus flying in or winter-road deliveries.	• Cost of non-traditional (store-bought) foods.
• **Community Well-Being**	• Traditional Foods	• Quality of traditional foods	• Potential for contamination of country foods due to construction and operations activities.	• Compare concentrations of contamination in country foods from an existing conditions assessment to concentrations predicted through modelling and / or measured during monitoring.
• **Community Well-Being**	• Public Safety	• Driver's Licence	• Community interest in more safe, licenced drivers.	• Number of community members with a Driver's Licence.
• **Community Well-Being**	• Public Safety	• Road Safety	• Increased traffic and road deterioration could lead to a rise in road-related incidents.	• Number of reported road accidents occurring along the region.
• **Community Well-Being**	• Public Safety	• Emergency Services	• Community concerns about strained emergency services and occupational hazards.	• Number of emergency calls serviced by Royal Canadian Mounted Police / Police, Fire / health, EMS / Medical transport.
• **Community Well-Being**	• Public Safety	• Violence and Harassment	• Community concerns about increased access to the community and interactions with external populations, including safety of Indigenous women and girls.	• Percent change in Crime Severity Index and Violent Crime Severity Index.
• **Community Well-Being**	• Biophysical Determinants of Health	• Air quality	• Project sites proximity to receptors determines level of air quality effects. • Construction equipment and activities will alter air quality. • Road traffic during operations will alter local air quality. • Construction and operations could result in pollution of local air quality, through other construction and operations activities including clearing, burning, blasting.	• Compare the potential for inhalation exposure and nuisance dust / dust contact due to construction and operations activities to existing conditions and / or concentrations measured during monitoring. • Compare existing versus predicted air concentrations due to project emissions during construction and / or concentrations measured during monitoring. • Compare existing versus predicted air quality concentrations based on actual number of vehicles per day, per hour, per season, per year using the road and / or concentrations measured during monitoring. • Compare existing versus predicted air concentrations due to other construction and operations activities and / or concentrations measured during monitoring.

Discipline	Valued Component	Indicators	Rationale for Selection	Measure of Change
• **Community Well-Being**	• Biophysical Determinants of Health	• Noise and vibration	• Road and construction noise and vibration levels could impact use of personal and community spaces. Project site proximity to receptors will determine noise and vibration levels. • Construction activities could result in temporary noise and vibration disturbances. • Higher traffic levels could contribute to increased noise and vibration levels.	• Compare the potential for noise and vibration due to construction and operations activities to existing conditions and / or concentrations measured during monitoring if complaints. • Compare existing versus predicted and / or monitored noise and vibration levels during construction if complaints. • Compare existing versus predicted and / or monitored noise and vibration levels during operations if complaints.
• **Community Well-Being**	• Biophysical Determinants of Health	• Soil quality	• Construction and operations activities could result in contamination to soils through deposition of dust.	• Compare existing versus predicted and / or monitored concentrations of project effects to soil in locations where soil impacts are expected based on dust deposition models.
• **Community Well-Being**	• Biophysical Determinants of Health	• Sediment quality	• Construction and operations activities could result in contamination to sediment through surface water runoff carrying solids, particulates and / or debris and through deposition of dust.	• Compare existing versus predicted and / or monitored concentrations of project effects to sediment in locations where sediment impacts are expected based on dust deposition models.
• **Community Well-Being**	• Biophysical Determinants of Health	• Human land use	• Use of the land for traditional and recreational activities could increase direct contact with soils and sediment, increase exposure to impacted outdoor air, increase consumption of traditional foods, increase direct contact with recreational water and alter sources of drinking water.	• Compare existing versus predicted use of lands and recreational waterbodies. • Qualitative assessment to understand the population engaged in traditional and / or recreational activities.
• **Community Well-Being**	• Biophysical Determinants of Health	• Accidents and malfunctions	• Potential for contamination of soils, sediments, air, drinking water, and recreational water after an accident or malfunction.	• Compare existing versus predicted and / or monitored concentrations of project emissions in soil, sediment, air, drinking water and recreational water.
• **Community Well-Being**	• Biophysical Determinants of Health	• Other environmental conditions and changes	• Potential for contamination of soils, sediments, air, drinking water, and recreational water.	• Compare existing versus predicted and / or monitored levels of effects in other media or foods.
• **Visual Environment**	• Cultural Heritage Resources and Indigenous Experience and Sense of Place	• Views from culturally significant sites; traditional use corridors and waterways; harvesting, ceremony, and gathering places; including any area or location identified as integral to Indigenous experience and sense of place.	• Visual change at or near places with cultural, spiritual, or historical importance can alter relationships to land, affect use, and diminish sense of place, cultural continuity, and community well-being.	• Visibility of Project within views; visual contrast with expected natural or existing character; viewer exposure / frequency.
• **Visual Environment**	• Recreation and Tourism	• Views from designated trails and lookouts; canoe routes / portages and backcountry campsites; tourism lodges / outfitters and popular scenic viewpoints.	• Visitor experience and satisfaction in remote settings rely on low visual intrusion and intact wilderness character; changes to prominent views can affect recreation quality and tourism offerings.	• Visibility of Project within views; visual contrast with expected natural or existing character; viewer exposure / frequency considering typical use patterns of park users.
• **Visual Environment**	• Parks and Protected Area	• Park landscape character and park viewscapes (for example, waterway corridors, designated lookouts, remoteness and wilderness character) as protected aesthetic resources in their own right.	• Visual intrusion may conflict with park management objectives to conserve natural, cultural, and recreational values and the associated sense of remoteness.	• Visibility of Project; visual contrast relative to targeted wilderness / aesthetic conditions as outlined in the Ontario *Provincial Parks and Conservation Reserves Act* (Government of Ontario, 2006) and the Ontario Parks Guidelines.
• **Visual Environment**	• Permanent Settlement	• Views from residences, community facilities (for example, schools, health centres), public spaces and main streets, and approach roads within settlement areas.	• Project-related tree clearing and structures can introduce or widen sightlines to the construction footprint, which reduces perceived visual quality and community character within settlement areas and affects overall community well-being.	• Visibility of the Project from community viewpoints; visual contrast with established community and landscape context; viewer exposure / frequency for residents and regular users of public places.

8.3.3 Spatial Boundaries of People Disciplines

As part of the assessment of existing conditions for the Community Access Road, discipline-specific study areas were developed for the people disciplines, to account for the potential impacts of the road. The study areas for each discipline are defined in **Table 8.3-3** and shown on **Figure 8.3-1** to **Figure 8.3-7**.

Table 8.3-3: Spatial Boundaries of People Discipline

Discipline(s)	Construction Disturbance Area	Local Study Area	Regional Study Area
• Aboriginal and / or Treaty Rights and Interests	• Includes the Project footprint (the linear road corridor itself) and 100-metre-wide right-of-way and associated infrastructure (temporary construction access roads, work areas, worker camps, and pits, quarries, and temporary access roads).	• Includes the Construction Disturbance Area, and extends approximately 5 kilometres on either side of the centreline of the Community Access Road, and 5 kilometres buffer around the other project components and temporary infrastructure (for example, aggregates sources, access roads, construction camps, staging areas, and stockpile areas). • Corresponds to the outermost boundaries of the combined Local Study Areas for the fish and fish habitat, surface water, vegetation, general wildlife, moose, air quality, noise, and visual valued components (as delineated in August 2020).	• Combined area of the quaternary watersheds that interact with the route alternatives and the Local Study Area. • Corresponds to the outermost boundaries of the combined Regional Study Areas for the fish and fish habitat, surface water, vegetation, and general wildlife valued components (as delineated in August 2020). • The Caribou Regional Study Area coincides with the Regional Study Area used for the assessment on caribou, which consists of four caribou ranges: Missisa, Nipigon, Ozhiski, and Pagwachuan.
• Acoustic and Vibration	• Includes the Project footprint (the linear road corridor itself) and 100-metre-wide right-of-way and associated infrastructure (temporary construction access roads, work areas, worker camps, and pits, quarries, and temporary access roads).	• Includes the Construction Disturbance Area and extends approximately 2 kilometres on either side of the centreline of the Community Access Road. The Local Study Area is the area where direct effects of the Community Access Road are likely to occur, including two alternative routes.	• Includes a 5-kilometre buffer to address indirect effects outside the Local Study Area.
• Cultural Heritage and Archaeology	• Includes the Project footprint (the linear road corridor itself) and 100-metre-wide right-of-way and associated infrastructure (temporary construction access roads, work areas, worker camps, and pits, quarries, and temporary access roads).	• Includes the Construction Disturbance Area and extends approximately 2.5 kilometres on either side of the centreline of the Community Access Road. The Local Study Area is the area where direct effects of the Community Access Road are likely to occur, including two alternative routes.	• Includes the Local Study Area and 1 kilometre buffer. The Regional Study Area is the area where indirect effects of the Community Access Road are likely to occur.
• Atmospheric Environment	• Includes the Project footprint (the linear road corridor itself) and 100-metre-wide right-of-way and associated infrastructure (temporary construction access roads, work areas, worker camps, and pits, quarries, and temporary access roads).	• Includes the Construction Disturbance Area, and extends approximately 5 kilometres on either side of the centreline of the Community Access Road.	• The Regional Study Area was not defined for air quality studies as effects were not expected to extend beyond the Local Study Area.
• Land and Resource Use	• Includes the Project footprint (the linear road corridor itself) and 100-metre-wide right-of-way and associated infrastructure (temporary construction access roads, work areas, worker camps, and pits, quarries, and temporary access roads).	• Parks and protected areas Local Study Area includes parks and protected areas within the Construction Disturbance Area. • Recreation and Tourism Local Study Area includes the Construction Disturbance Area. The impact area for the atmospheric environment, acoustic and vibration environment, surface water, vegetation, fish and fish habitat, and wildlife (relevant game species only) will also be considered. • Extractive Resource Industry Local Study Area includes the Construction Disturbance Area. • Forestry Industry Local Study Area considers any Forestry Management Unit transected by the Construction Disturbance Area. This only includes the Ogoki Forest Management Unit. • Remote Outfitters Local Study Area considers outfitters close to the Construction Disturbance Area.	• Parks and Protected Areas Regional Study Area includes the entirety of the Parks and protected areas that are within the 5 kilometre buffer. (Albany River Provincial Park). • Recreation and Tourism Regional Study Area included the Construction Disturbance Area plus 5 kilometre buffer. Area of focus is the area of impact on populations of relevant fish and game species whether through habitat disturbance, tag allocations or increase access and pressure on species. • Extractive Resource Industry Regional Study Area includes the Construction Disturbance Area boundary plus a 5 kilometre buffer. • Forestry Industry Regional Study Area includes a 5 kilometre buffer around the Construction Disturbance Area. To be considered are Forestry Management Units intersected by the area of impact to Caribou populations

Discipline(s)	Construction Disturbance Area	Local Study Area	Regional Study Area
		• Trapping and Harvesting Local Study Area considers traplines and harvesting areas (fishing and hunting) crossed by the Construction Disturbance Area plus a 5 kilometre buffer. • Energy and Linear Infrastructure Local Study Area includes the Construction Disturbance Area and a 5 kilometre buffer from the Construction Disturbance Area.	which is to be determined by the Wildlife Valued Component. Potential future forest harvesting could be accessible with the introduction of the road if the Ministry of Natural Resources creates a Forest Management Unit. These areas would include any merchantable timber but must have the capability of being considered sustainable. • Remote Outfitters Regional Study Area includes outfitters within the Construction Disturbance Area plus a 5 kilometre buffer. • Trapping and Harvesting Regional Study Area includes furbearing species wolverine and wildlife Regional Study Area. • Energy and Linear Infrastructure Regional Study Area includes potential utility linkages across several proposed road corridors in the north and possible future water-power lease agreements in the area.
• Community Well-Being	• Includes the Project footprint (the linear road corridor itself) and 100-metre-wide right-of-way and associated infrastructure (temporary construction access roads, work areas, worker camps, and pits, quarries, and temporary access roads).	• Includes: – Marten Falls First Nation – Aroland First Nation • Regional Study Area Communities with a potential effect pathway in the Local Study Area: – Animbiigoo Zaagi'igan Anishinaabek – Attawapiskat First Nation; – Constance Lake First Nation; – Eabametoong First Nation; – Fort Albany First Nation; – Ginoogaming First Nation; – Kasabonika Lake First Nation; – Kashechewan First Nation; – Kitchenuhmaykoosib Inninuwug First Nation; – Kingfisher Lake First Nation; – Long Lake #58 First Nation; – Mishkeegogamang First Nation; – Neskantaga First Nation; – Nibinamik First Nation; – Wapekeka First Nation; – Wawakapewin First Nation; – Webequie First Nation; – Weenusk First Nation; and – Wunnumin Lake First Nation.	• Includes the following municipalities: – Municipality of Greenstone – Municipality of Thunder Bay • Includes the following Indigenous communities: – Animbiigoo Zaagi'igan Anishinaabek; – Attawapiskat First Nation; – Constance Lake First Nation; – Eabametoong First Nation; – Fort Albany First Nation. – Ginoogaming First Nation; – Kasabonika Lake First Nation; – Kashechewan First Nation; – Kitchenuhmaykoosib Inninuwug First Nation; – Kingfisher Lake First Nation; – Long Lake #58 First Nation; – Mishkeegogamang First Nation; – Neskantaga First Nation; – Nibinamik First Nation; – Wapekeka First Nation; – Wawakapewin First Nation; – Webequie First Nation; – Weenusk First Nation; – Wunnumin Lake First Nation; and – Red Sky Métis Independent Nation.
• Visual Environment	• Includes the Project footprint (the linear road corridor itself) and 100-metre-wide right-of-way and associated infrastructure (temporary construction access roads, work areas, worker camps, and pits, quarries, and temporary access roads).	• Includes the Construction Disturbance Area, and extends approximately 2.5 kilometres on either side of the centreline of the Community Access Road.	• Includes the Construction Disturbance Area, and extends approximately 8 kilometres on either side of the centreline of the Community Access Road. (a total width of 16 kilometres).

Figure 8.3-1: Aboriginal and / or Treaty Rights Study Area

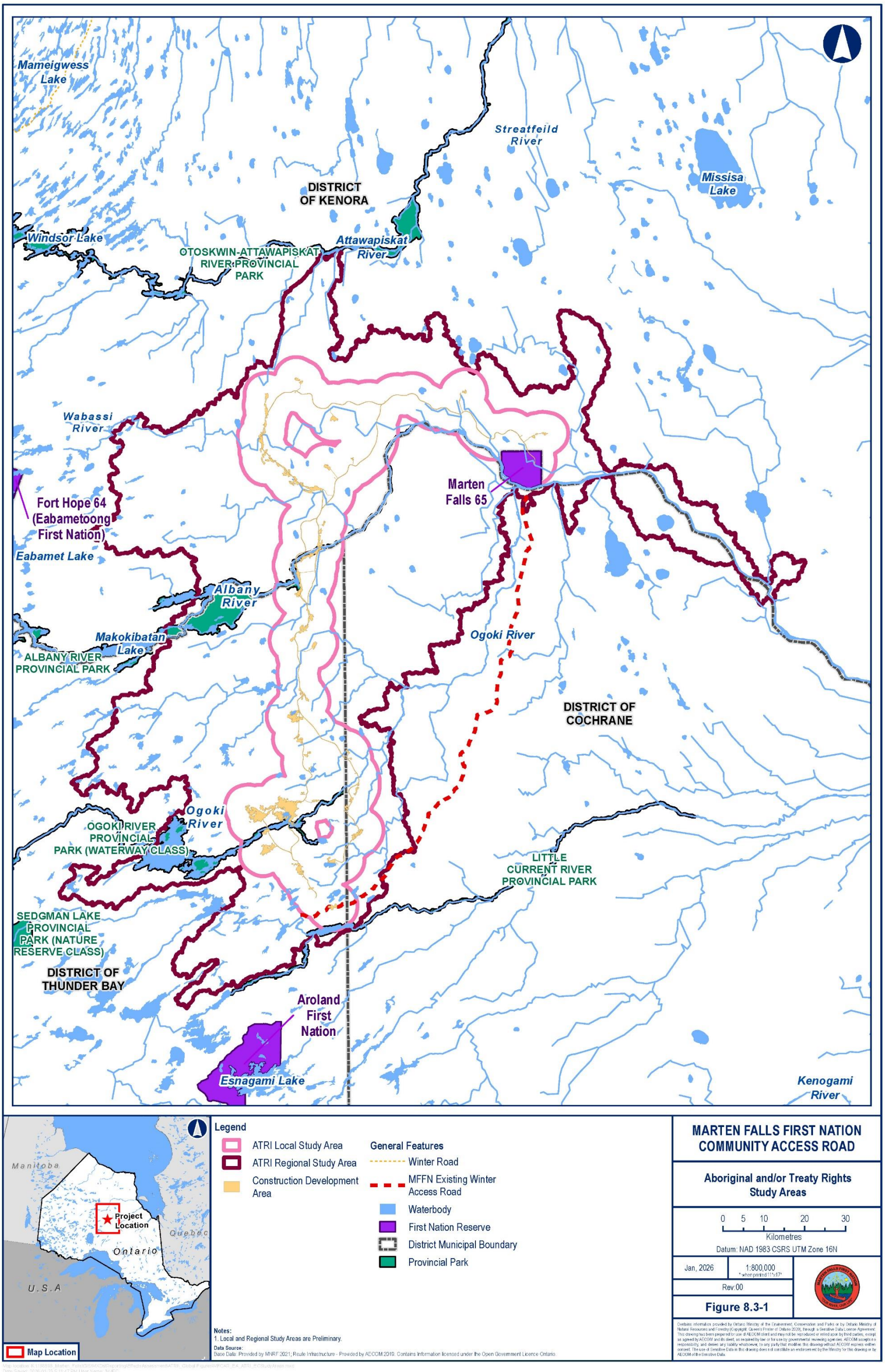


Figure 8.3-2: Acoustic and Vibration Environment Study Area

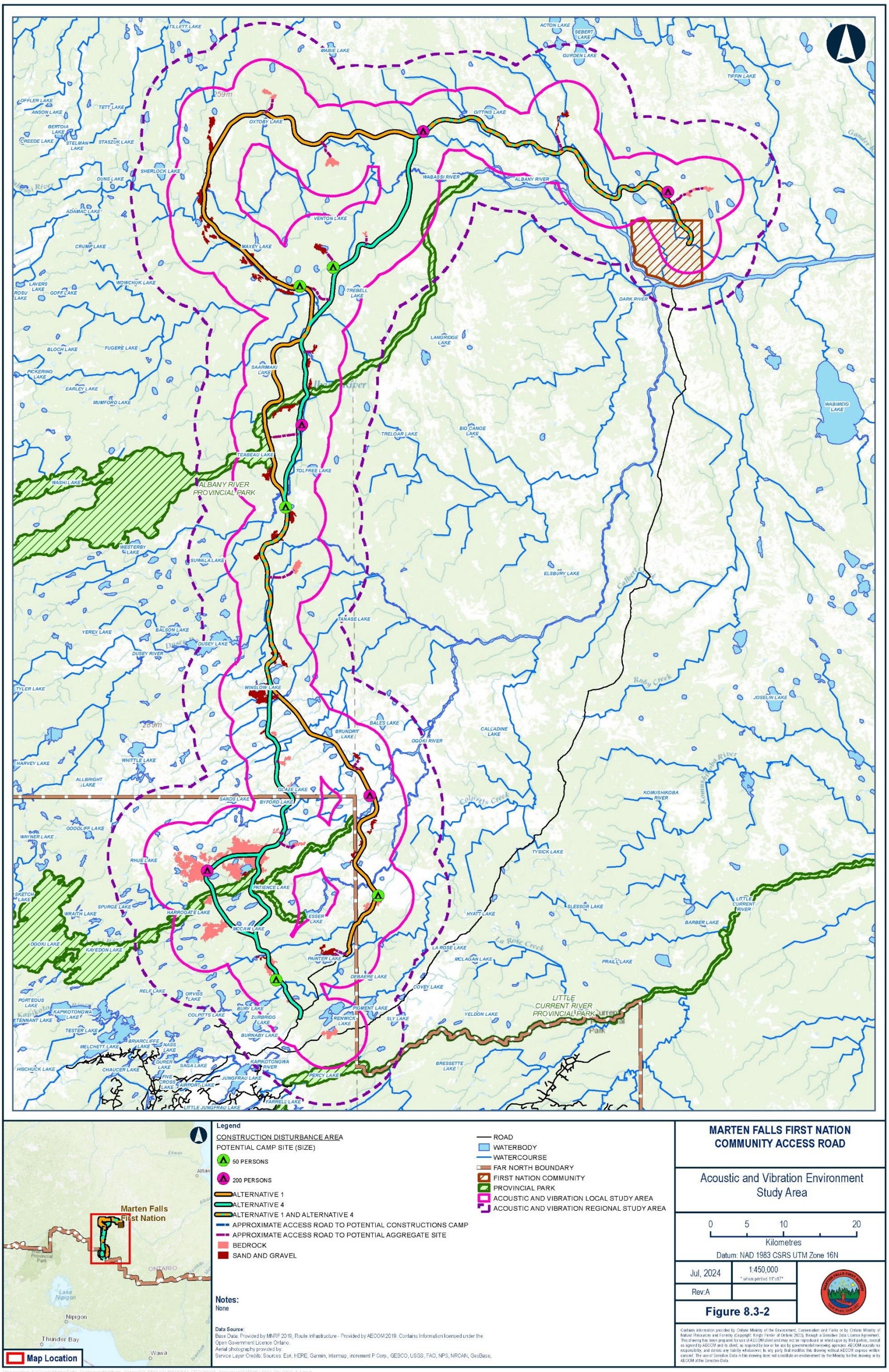


Figure 8.3-3: Archaeology and Cultural Heritage Study Area

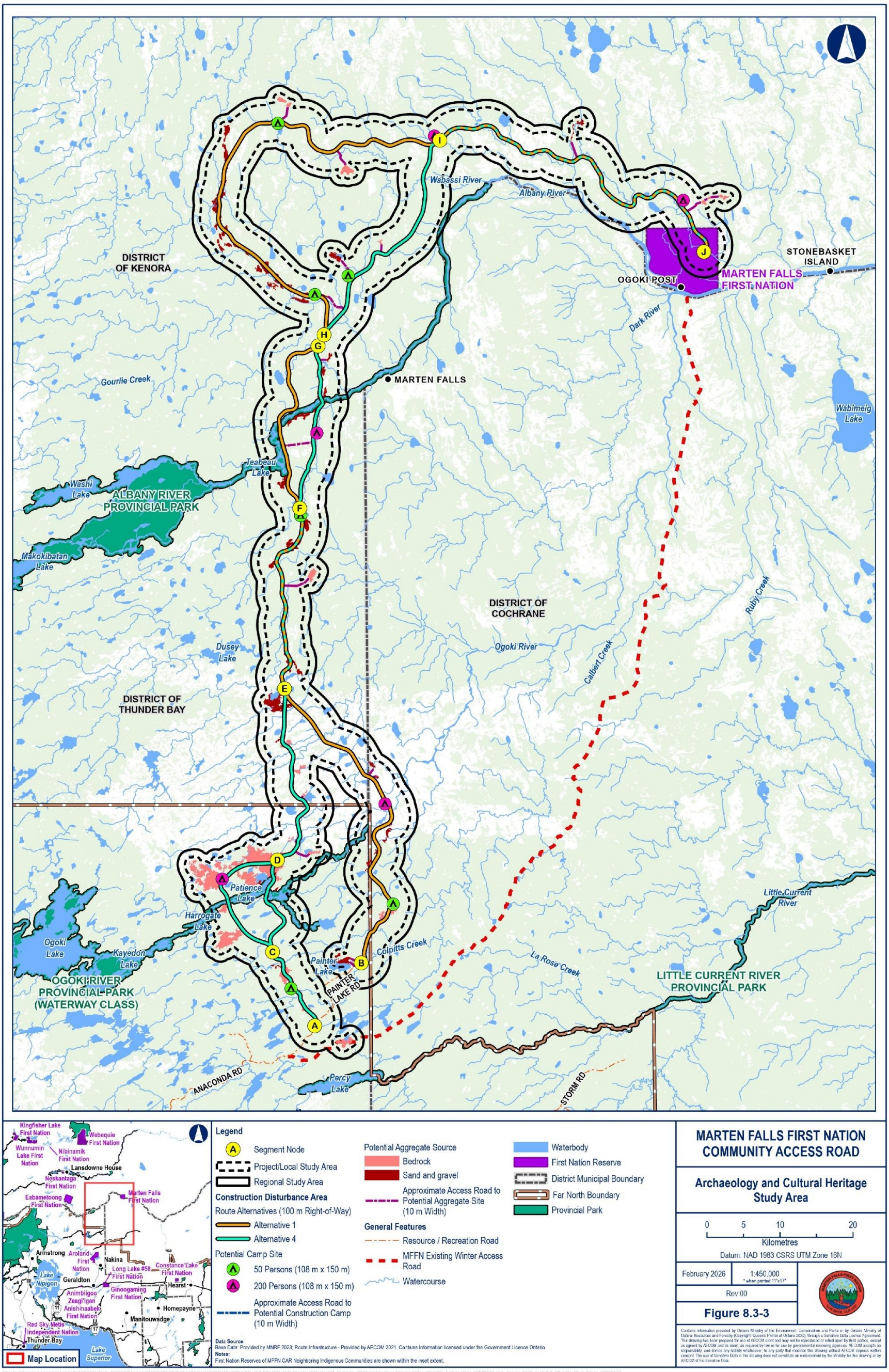


Figure 8.3-4: Air Quality Study Area

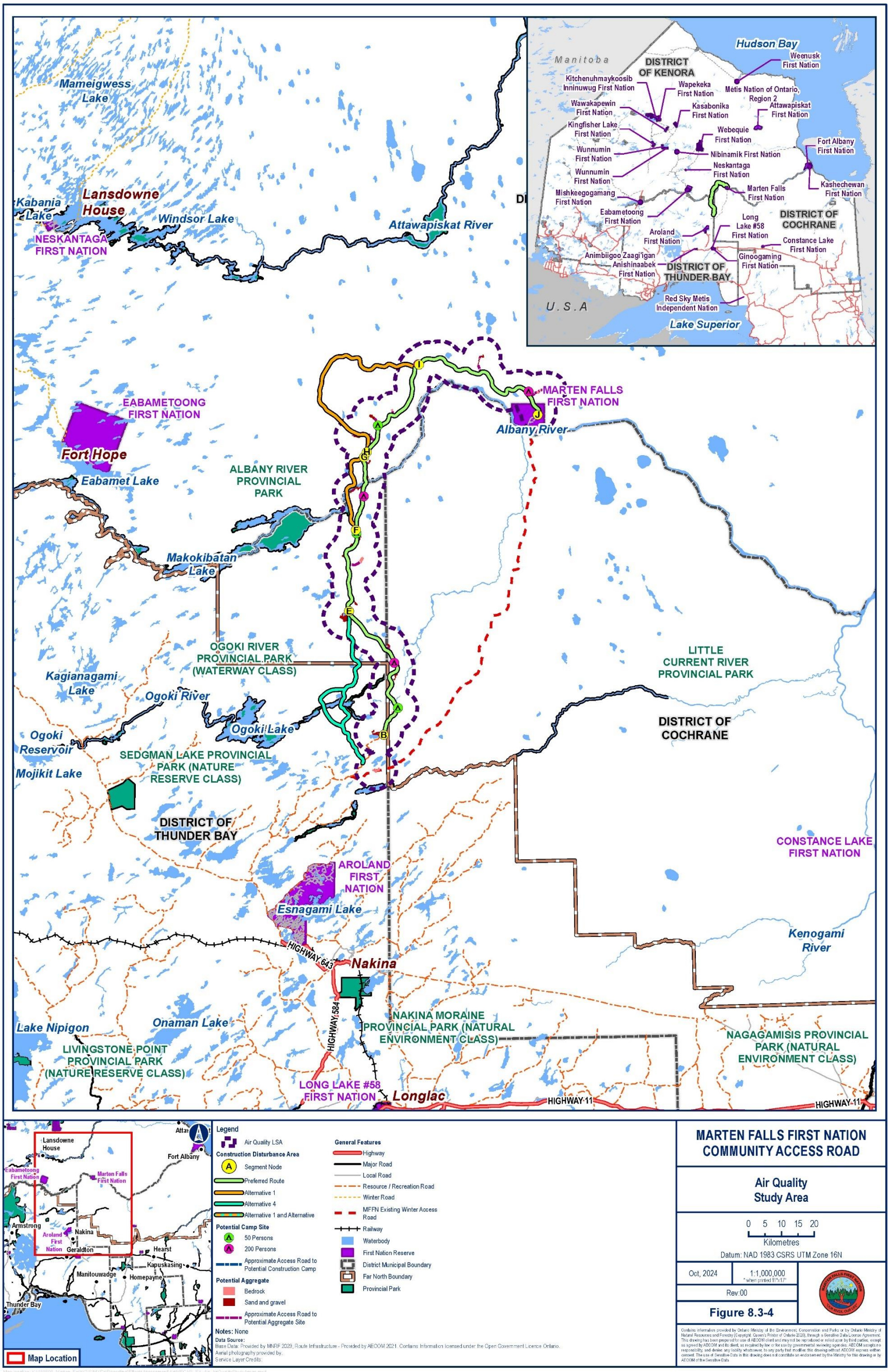


Figure 8.3-5: Community Well-Being Study Area

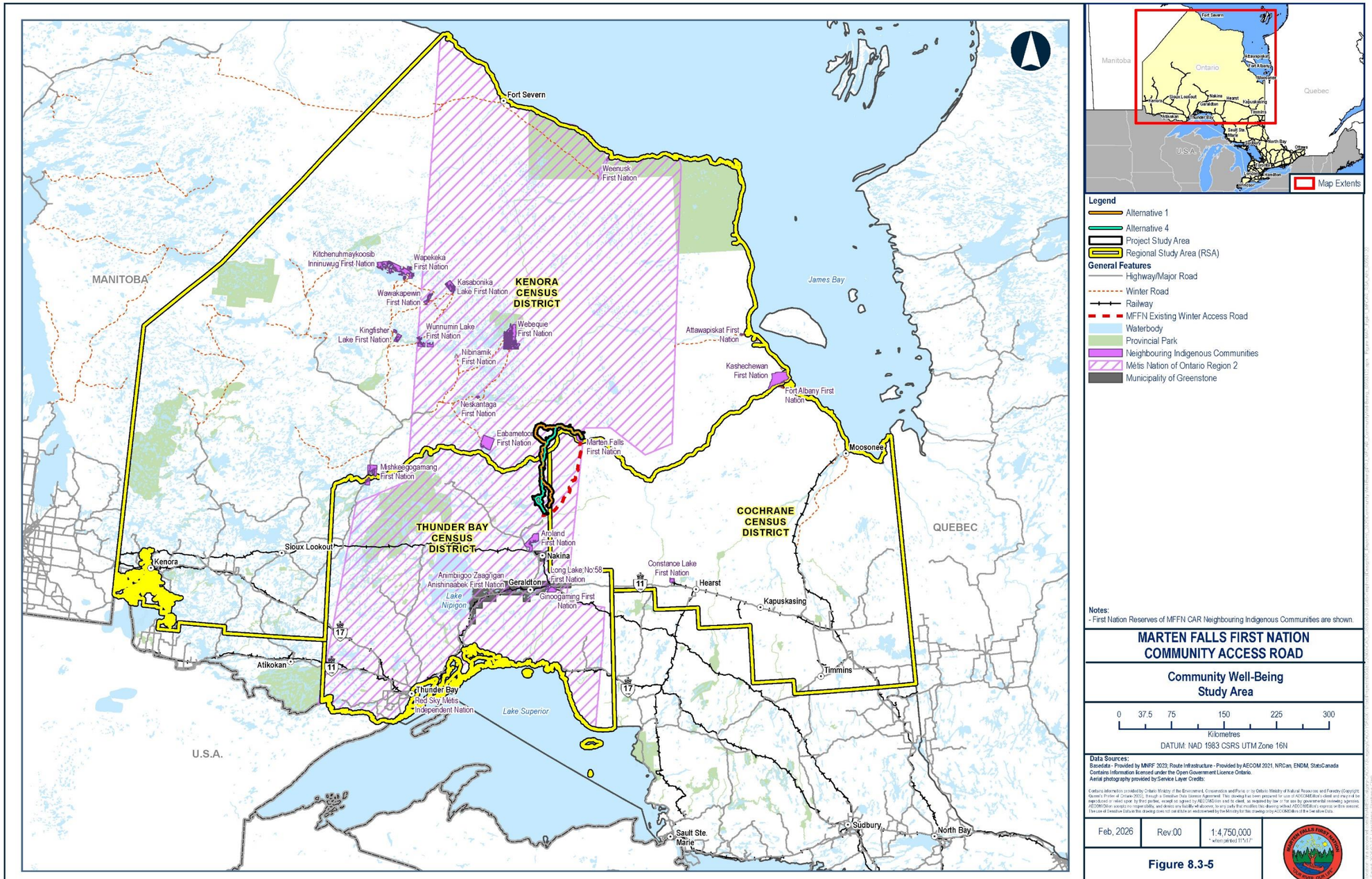


Figure 8.3-6: Land and Resource Use Study Area Map

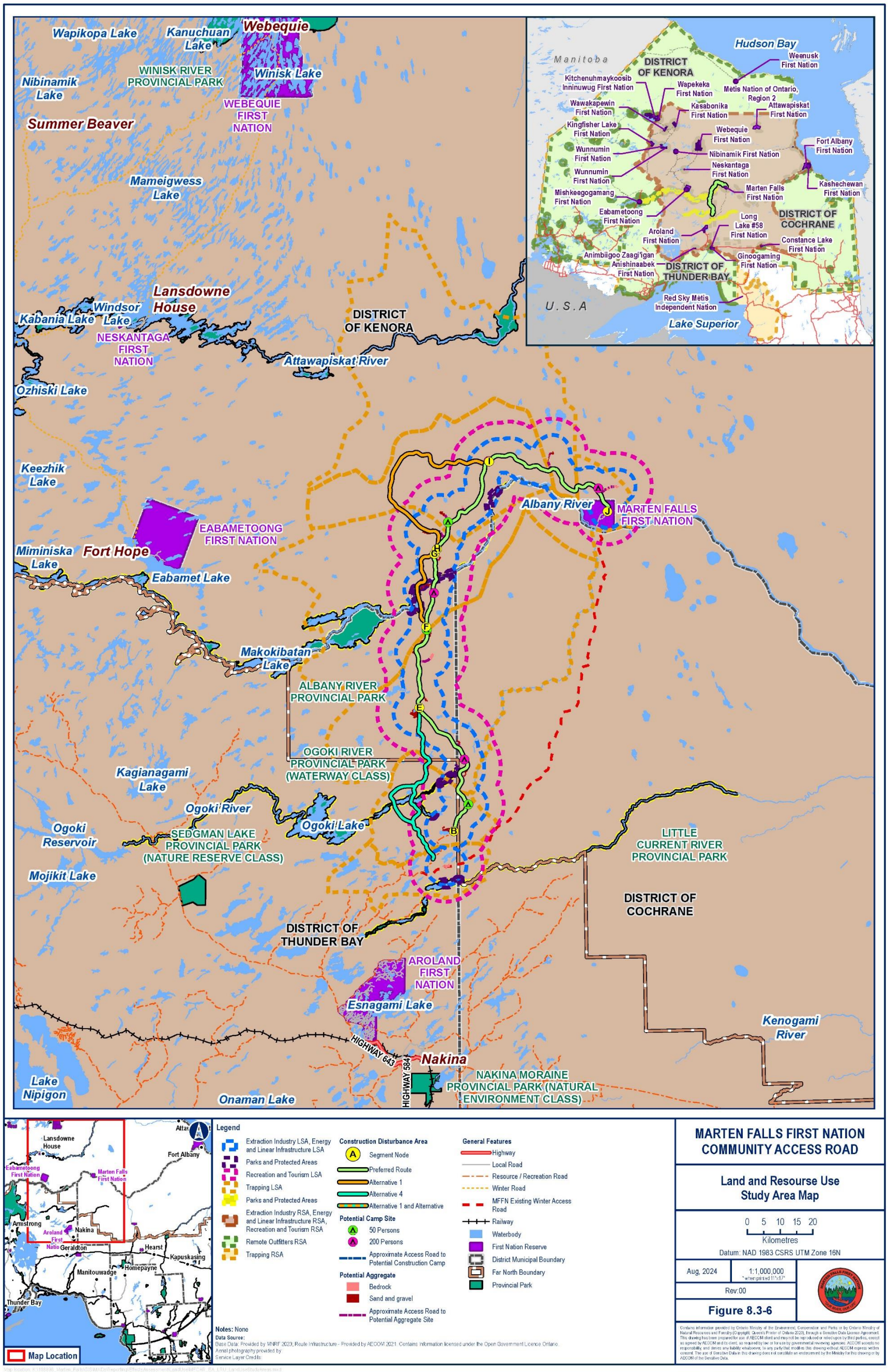
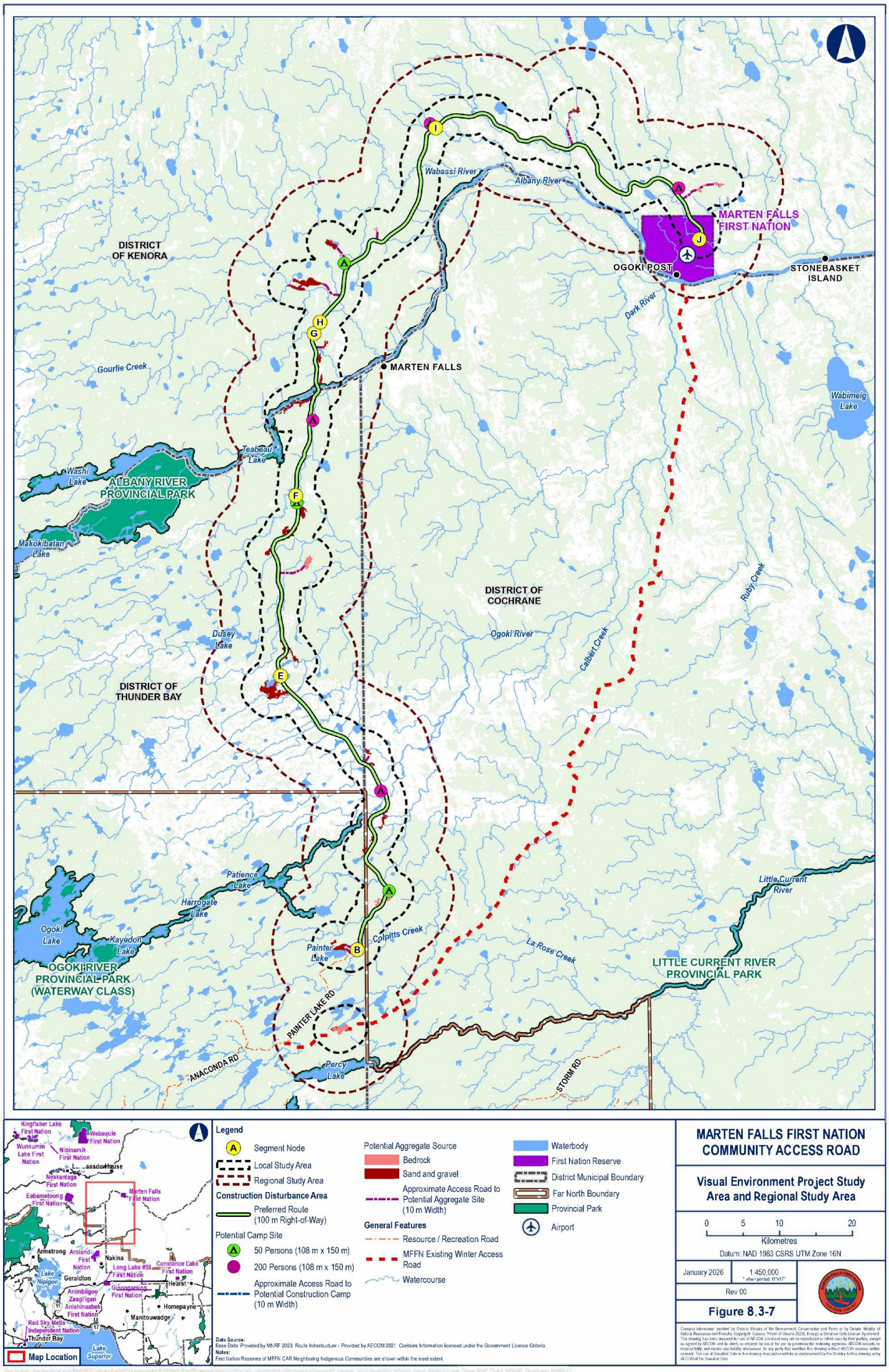


Figure 8.3-7: Visual Environment Project Study Area and Regional Study Area



8.3.4 Aboriginal and / or Treaty Rights and Interests

Marten Falls First Nation, is committed to developing a shared understanding of Aboriginal and / or Treaty Rights and Interests within the Community Access Road's assessment Study Area and is consulting with the following 23 Indigenous communities:

- Aroland First Nation;
- Attawapiskat First Nation;
- Animbiigoo Zaagi igan Anishinaabek First Nation;
- Constance Lake First Nation;
- Eabametoong First Nation;
- Fort Albany First Nation;
- Ginoogaming First Nation;
- Kasabonika Lake First Nation;
- Kashechewan First Nation;
- Kingfisher Lake First Nation;
- Kitchenuhmaykoosib Inninuwug First Nation;
- Long Lake #58 First Nation;
- Métis Nation of Ontario;
- Marten Falls First Nation;
- Mishkeegogamang First Nation;
- Neskantaga First Nation;
- Nibinamik First Nation;
- Red Sky Métis Independent Nation;
- Wapekeka First Nation;
- Wawakapewin First Nation;
- Webequie First Nation;
- Weenusk First Nation; and
- Wunnumin Lake First Nation.

As a First Nation Proponent, constitutionally protected rights are of utmost importance to Marten Falls First Nation. These steps are outlined in the Aboriginal and Treaty Rights and Interests Study Plan (AECOM, 2021) found in **Appendix O** and involve validating, building on, and revising the Project's understanding of Aboriginal and / or Treaty Rights and Interests relevant to the proposed Community Access Road, the context of existing impacts, guiding values and topics associated with community well-

being and cultural expression, pathways of potential impacts, anticipated levels of impact, measures to address potential impacts, and engaging with communities to validate the outcomes of the assessment.

The Project Team prepared a community-specific Aboriginal and / or Treaty Rights and Interests: Impact Assessment Report for each Indigenous community. Each community received a copy of their Draft Impact Assessment Report to review and provide feedback prior to finalizing their Aboriginal and / or Treaty Rights and Interests: Impact Assessment Report. To honour, respect, and protect confidential and / or sensitive information (in other words, Indigenous Knowledge), **these community-specific Impact Assessment Reports will not be publicly distributed.** Existing conditions were based on information, inputs, and materials provided directly by individual communities through the Project's Indigenous Knowledge and Consultation and Engagement programs and supplemented by publicly available sources where appropriate. Each community received a tailored, context-specific Aboriginal and / or Treaty Rights and Interests: Impact Assessment Report addressing key areas including pre- and post-contact history, language, governance, hunting and trapping, fishing, berry and plant harvesting, cultural, spiritual and historical sites and areas, travel, habitation, experience being on the land, and rights and interests related to the project. A description of an "Area of Interest" was also included in each report. An Area of Interest identifies where each Indigenous community may exercise / hold rights and interests.

8.3.4.1 Historical and Regional Context

The culture, knowledge, and history of Indigenous peoples is passed down through oral stories and accounts from generation to generation. The information presented below was collected from written academic articles, journals, and other publicly available documents, many of which were informed by oral history. Indigenous authors and publishers were sought where possible to capture a more authentic understanding of the history, culture, rights, and interests of Indigenous peoples, both pre- and post-contact, and how Indigenous peoples and their rights and interests have been cumulatively impacted to date. Note, the term "Indian," which is the historical term used by the Crown for First Nations peoples in Canada, is only used throughout when referencing historical documents and associated content.

8.3.4.2 Pre-Contact Context

Sections 5.1.1.1 to 5.1.1.6 of the Aboriginal and / or Treaty Rights and Interests Technical Support Document (**Appendix O)** describe aspects of the societies of Indigenous peoples of the region prior to more consistent contact with Europeans (pre-contact), which

occurred in the mid- to late-17th century. The Indigenous peoples of what is now known as Northern Ontario primarily consisted of the Anishinaabeg (which translates to “Original People”) and the Cree peoples (Hele, 2020). The Anishinaabeg in this region of Ontario have been referred to as the Northern Ojibwa. The Cree people of this region are known as the Omushkegowuk (“People of the Muskeg”). Throughout Sections 5.1.1.1 to 5.1.1.6 of the Aboriginal and / or Treaty Rights and Interests Technical Support Document (**Appendix O)**, “Indigenous peoples” refers to the Anishinaabeg and the Omushkegowuk peoples of the region specifically, unless otherwise stated. Note that while the information in the following sections may be described in past tense, and many circumstances have changed due to cumulative effects on Indigenous peoples including colonization, it is recognized that the cultural traditions, worldview, teachings, knowledge, and laws described are still valued by, practiced, and deeply important to many community members today. Additional information on communities as they exist today was provided in the confidential community-specific Aboriginal and / or Treaty Rights and Interests: Impact Assessment Reports.

8.3.4.2.1 Seasonal Lifeways

Indigenous lifeways were deeply rooted in culture, language, stories, and ceremony, and grounded in a sacred relationship with the Earth, sky, water, plants, and animals (Roberson, 2023). Prior to contact, the Anishinaabeg and Omushkegowuk organized their lives according to seasonal cycles. The Anishinaabeg recognized six seasons: Ziigwan (spring), Miinokamin (early summer), Niibin (summer), Tagwaagin (fall), Oshkibiboon (young winter), and Biboon (winter), each marked by changes in the landscape such as leaf fall or ice breakup (Davidson-Hunt and Berkes, 2003). The Omushkegowuk also described six seasons, closely tied to the freezing and thawing of waterways, including Sîkwan (breakup), Miloskamin (spring), Nîpin (summer), Takwâkin (fall), Mikiskâw (freeze-up), and Pipon (winter), reflecting their reliance on rivers and lakes for their livelihoods (Honigmann, 1961; Six Seasons of the Asiniskaw Īthiniwak, no date). Both the Anishinaabeg and Omushkegowuk used moon cycles to mark time and guide seasonal activities (Davidson-Hunt and Berkes, 2003).

The Anishinaabeg and Omushkegowuk were hunters and gatherers who travelled seasonally to follow resources. They used birch bark canoes, rafts, snowshoes, and toboggans for travel depending on the season (Long, 2010). A wide variety of foods were harvested, including birds, big game such as moose and caribou, furbearers, and fish (Dawson, 1987; Long, 2011; Long et al., 2017). Early accounts indicate that the Omushkegowuk spent much of the year pursuing game over large areas in the north, while areas to the south provided food the Anishinaabeg were able to harvest in large quantities, including fish, deer, moose, and caribou, requiring less travel (Bishop and

Smith, 1975). Both the Anishinaabeg and Omushkegowuk also gathered berries, plants, medicines, and fuels, with manoomin (wild rice) being an important staple among the Anishinaabeg in the Great Lakes region (Desmarais, 2019; Kuhnlein and Turner, 1991).

Social organization was family-based, with small habitation sites and hunting camps occupied seasonally. Omushkegowuk families often travelled in microbands of 2 to 5 families and connected as macrobands of up to 15 families during seasonal rounds (Cummins, 1992). Summer gatherings were significant for both groups, drawing hundreds of people for visiting, trade, marriage negotiations, and ceremonies (Bohaker, 2020; Leacock, 1981). Gender roles were complementary: men primarily hunted and crafted tools, while women gathered plants, prepared food, and produced goods for family and trade (McMillan and Yellowhorn, 2004; Lytwyn, 2002). Seasonal activities included summer fish harvesting and berry drying, fall preparations for winter, and spring goose hunts, reflecting lifeways intimately tied to the land and its cycles (Marten Falls First Nation and Ontario Ministry of Natural Resources and Forestry, 2020; Omushkego Education and Ojibway and Cree Cultural Centre, 2006).

8.3.4.2.2 Culture and Worldview

Indigenous peoples of the region practiced a cultural way of life grounded in relationships with the environment, shared through oral stories and practices (Marten Falls First Nation and Ontario Ministry of Natural Resources and Forestry, 2020). Their worldview contrasted with European notions of land as property; for Indigenous peoples, land was something to be cared for and honoured (Tsuji and Tsuji, 2021). Identity and law were rooted in kinship, respect, reciprocity, and responsibility (Bell, 2013). These perspectives recognized the interconnection of all creation, where plants and animals preceded humankind and assisted humans upon arrival (Johnston, 2006; Luby et al., 2021). The Anishinaabe origin story reflects this understanding, placing humans last in the order of creation and emphasizing their duty to care for Mother Earth (Luby et al., 2021).

Oral histories reinforce values of respect and reciprocity, including offering gifts after hunts and using one's gifts for the good of the community and creation (Bell, 2013; Tapestry Institute, no date). These beliefs were embedded in language, place names, and memory, which conveyed the spatial and temporal dynamics of the land (Davidson-Hunt and Berkes, 2003). Lands and waters provided not only sustenance but spiritual connection, as both animate and inanimate elements were believed to have spirit life (Simpson, 2000a). Many Anishinaabeg understood the world to be inhabited by spiritual beings associated with places and seasons, and these beliefs remain significant today (Johnston, 2006; Honor the Earth, 2017).

8.3.4.2.3 Language

Indigenous culture is deeply rooted in language, which shapes identity and worldview (Wastesicoot, 2015). The Anishinaabeg spoke Anishinaabemowin (Ojibwe) and the Omushkegowuk spoke Inilîmowin (Swampy Cree), both part of the Algonquian language family and characterized as polysynthetic, forming long compound words to convey complex meanings (Oxford, 2019). For example, Boozhoo in Anishinaabemowin acknowledges the spirit of Nanaboozhoo and conveys the breath and feeling of life (Horton, 2017), while niwanahikân in Inilîmowin means “I am setting my traps” (Omushkego Education, 2016). These languages classify nouns by animacy, with spiritually significant objects like drums treated as animate (Oxford, 2019). Neither language had a written form prior to contact, though missionaries later introduced writing systems (Ojibway-Cree Cultural Centre, 1986). By the early 1800s, a mixed Cree-Ojibwe dialect emerged in shared territories, evolving into Anishininiimowin (Oji-Cree) (Lytwyn, 2002).

8.3.4.2.4 Learning and Knowledge Building

Indigenous educational traditions are holistic, addressing intellectual, spiritual, emotional, and physical dimensions of the learner (Royal Commission on Aboriginal Peoples, 1996a). Learning is understood as a lifelong process rooted in personal experience, ceremony, reflection, and sharing, and grounded in relationships with the natural world (Simpson, 2000a; McGregor, 2013). Knowledge is transmitted through rituals, storytelling, and land-based practices, which convey worldviews and instructions for maintaining balance in natural and spiritual realms (Honor the Earth, 2017). These practices are relational and place-based, with oral sources such as conversations and traditional teachings forming the foundation of Indigenous Knowledge systems (Johnston et al., 2018). Anishinaabe learning modalities include dreaming, ceremonies, experiential learning, and storytelling (Simpson, 2000b). Being on the land is critical for learning by doing, and observation is central, with plants, animals, and spiritual entities regarded as teachers offering lessons of care and reciprocity (Simpson, 2000b). Storytelling conveys laws, responsibilities, morals, and life lessons, and its meaning varies by context, time, and teller (Fontaine, 2020; Peltier, 2021). Oral tradition is non-linear and cyclical, linking past and present, and children learn through listening, observing, and role modelling within extended families and communities (Anderson, 2002; Bell, 2013). These approaches foster deep relationships with the land and spiritual world, safeguarding cultural continuity across generations.

8.3.4.2.5 Governance and Legal Principles

Both the Anishinaabeg and Omushkegowuk had their own forms of governance in place prior to contact with Europeans, rooted in spiritual, social, and political conventions that guide relationships with people and the natural world (Borrows, 2002). The Anishinaabeg are traditionally organized through the hereditary clan system known as the Doodemaag, where clans carry responsibilities for leadership and social roles (Bohaker, 2020; Corbiere, 2019). Clans are most often represented by animals, but they could also be a tree or a Manitou (for example, thunderbirds, mermen, underwater manidoos), and they tied people to specific places those doodems inhabited (Corbiere, 2019).l Each doodem has its own leadership structure, including Chiefs, Elders, and Councils, and governance practices emphasize consensus and stewardship rather than hierarchy (Miller, 2010; Bohaker, 2020). Women's councils and warrior councils hold significant influence, and leadership is expected to be generous and community-oriented (Miller, 2010; Bohaker, 2020). These principles are reflected in oral histories and sacred stories, which explain the origins of the doodem tradition and reinforce kinship as a foundation of law and identity (Bohaker, 2020). Broader alliances were formalized through the Niswi-mishkodewinan (Three Fires Confederacy), which continues to hold cultural significance today (Anishinabek Nation, 2023a; 2023b).lThe Omushkegowuk governance system is based on kinship, with families as primary self-governing units supported by extended family networks (Royal Commission on Aboriginal Peoples, 1996b; Wastesicoot, 2015). Leadership is consultative and consensus-based, with okimâw recognized for wisdom, generosity, and knowledge of the land and animals (Lytwyn, 2002; Preston, 1990). Women historically played vital roles as keepers of stories and laws, and their knowledge complemented men's expertise in resource management (Hookimaw-Witt, 2006; Walker, 2021). lBoth the Anishinaabeg and Omushkegowuk uphold natural law, emphasizing interconnectedness and responsibilities to maintain harmony among all beings (McGregor, 2013). Among the Anishinaabeg, this is expressed through Mino-Bimaadiziwin, the way of living a good life, guided by the Seven Teachings of truth, humility, respect, love, honesty, courage, and wisdom (Bell, 2013; Seven Generations Education Institute, 2021). Similarly, Omushkegowuk teachings centre on Wahkotowin and Mino-Pimatisiwin, which affirm relationships and balance within the community and the natural world (Cardinal, 2007; Gaudet and Chilton, 2018).

8.3.4.2.6 Resource Management and Stewardship

Communal resource management is a defining feature of Indigenous land-use systems, where resources are shared and managed collectively through consensus-based decision-making (Berkes, 1989; as cited in Berkes et.al., 1991). Prior to European

settlement, hunting groups moved widely across regions, later shifting to family-based territories as resource scarcity and trade pressures increased (Leacock, 1954, as cited in Bishop, 1970). Among the Omushkegowuk, winter hunting groups centred around river basins, with core areas used intensively and ranges passed down through families, though boundaries remained fluid before the fur trade era (Lytwyn, 2002). Early traders noted freedom of movement and peaceful coexistence among groups, contrasting with rigid territorial ownership introduced later (Honigmann, 1956, as cited in Tsuji et al. 2011).

These practices reflect a worldview grounded in interconnection, reciprocity, and responsibility to maintain balance within creation (Davidson-Hunt and Berkes, 2003; Tsuji and Tsuji, 2021). Stewardship is considered a sacred duty, expressed through teachings such as gimiinigoowizimin gaaganawendang, meaning “keeper of the gifts,” and reinforced through seasonal feasts honouring beings that sustain life (Davidson-Hunt et al., 2005). Among the Omushkegowuk, land stewardship remains central to cultural ethics (Berkes et al., 1991). Stories continue to teach these responsibilities, such as “The Year the Roses Died,” which emphasizes balance and relational accountability (Geniusz, 2015; Campeau, 2019).

8.3.4.3 Post-Contact Context

Indigenous peoples interacted with Europeans as early as 1000 A.D., but sustained contact began with permanent settlements in the 17th and 18th centuries (Crown-Indigenous Relations and Northern Affairs Canada, 2013). The fur trade drove alliances between Indigenous peoples and French and British newcomers, creating extensive trade networks along existing routes and spurring exploration into the Great Lakes and Hudson Bay regions. The Hudson’s Bay Company was established in 1670 (Finch, 2013), and competition for furs led to conflict and displacement of Indigenous groups until the Great Peace Treaty of 1701. British control followed the fall of Montreal in 1760 and the Treaty of Paris in 1763, alongside the Royal Proclamation, which specified how the British colonies were to be administered and established a framework for the British Crown to acquire Indigenous interests in land through treaties (Crown-Indigenous Relations and Northern Affairs Canada, 2017). Over the next 120 years, the relationship between First Nations and the British Crown transformed from one of allyship to wardship, as settler expansion, resource demands, and legislative developments increased Crown authority over First Nations and their lands (Crown-Indigenous Relations and Northern Affairs Canada, 2017; Pettit, 2016).

8.3.4.3.1 Fur Trade and the Hudson's Bay Company

In 1670, the British Crown issued a royal charter creating the Hudson's Bay Company and granting it exclusive rights to trade, mineral claims, and governance over the Hudson Bay drainage area, referred to as Rupert's Land, which covered a large portion of what is now Canada (Ojibway-Cree Cultural Centre, 1986). The charter did not create political or legal rights over Indigenous peoples (Archives of Ontario, no date).

The Company established its first permanent trading post in the region at Fort Albany in 1679 and later expanded inland, including posts at Henley House and Marten Falls, with settlements forming around these sites (Crown-Indigenous Relations and Northern Affairs Canada, 2017). By 1870, there were 97 trading posts in Rupert's Land, including Fort Hope and Lansdowne House (Archives of Ontario, no date).

Trading posts became centres for commerce and social gatherings, relying on Indigenous Knowledge and labour for survival and the supply of furs (Ojibway-Cree Cultural Centre, 1986). Over time, Indigenous peoples became increasingly dependent on European products, and traditional economies shifted as men took seasonal employment with the Company (Long, 2011; Marten Falls First Nation and Ontario Ministry of Natural Resources and Forestry, 2020).

The fur trade's profitability led to competition and conflict until the Hudson's Bay Company merged with the Northwest Company in 1821, creating a monopoly that lasted until 1869 (Ojibway-Cree Cultural Centre, 1986; Archives of Ontario, no date). This monopoly reduced trading options for Indigenous peoples and contributed to profound changes in lifeways. Starvation became common in the 19th century as key species such as beaver, moose, and caribou declined due to overharvesting, forcing reliance on purchased goods and settlement near trading posts (Ojibway-Cree Cultural Centre, 1986; Bishop, 1970). The influx of traders and settlers also introduced diseases and alcohol, causing widespread harm (Crown-Indigenous Relations and Northern Affairs Canada, 2017). Missionaries followed, introducing Anglican and Catholic faiths and suppressing Indigenous ceremonies and practices, replacing them with Christian rituals and names (Ojibway-Cree Cultural Centre, 1986).

8.3.4.3.2 Métis Peoples

Métis communities in Ontario emerged through intermarriage between French and English traders and First Nation women during the fur trade era, forming distinct settlements along waterways and trade routes (Métis Nation of Ontario, 2023a). The origins of the Métis are closely tied to marriage alliances that supported trade and military relationships in the 17th and 18th centuries (Carrière and Dumont, 2017). Over

time, Métis communities developed unique identities, with settlements expanding along fur trade routes and forming interconnected networks based on mobility, kinship, and shared history (Métis Nation of Ontario, 2023b; Peterson, 1985).

By the early 19th century, Métis communities were well established in the Great Lakes region, with Fort Williams recognized as one of the first Métis settlements in Canada (Peterson, 1978; Tronrud and Epps, 1995, as cited in Gale, 1998). Métis identity solidified through reliance on the fur trade, adaptation of Indigenous and European cultural traditions, and strong kinship ties (Peterson, 1978). Many Métis families maintained close connections with First Nations, sharing territories and lifeways, and speaking Ojibway and Cree languages (Foster, 1985; Teillet, 2013). As settlement pressures grew, Métis communities faced increasing marginalization, culminating in the Red River Rebellion of 1885 led by Louis Riel, which sought recognition of Métis rights and title but ended in defeat and Riel's execution (Ouellet and Hanson, 2009; Métis Nation of Ontario, 2023a).

By the mid-19th century, British authorities had developed a policy of Métis collective non-recognition, reflecting colonial objectives to assimilate Indigenous peoples (Proceedings of the Standing Senate Committee on Aboriginal Peoples, 2017). Following these events, many Métis in Ontario concealed their identity while continuing cultural practices (Métis Nation of Ontario, 2023a). Today, the Métis Nation of Ontario Registry Policy defines citizenship through self-identification, historic ancestry, and community acceptance (Métis Nation of Ontario, 2023c).

8.3.4.3.3 Early Legislation and Policy

As the British need for the military allyship of Indigenous peoples waned, an emerging perspective from the British reflected a belief that British society and culture were superior, and colonial authorities advanced a "civilization" policy aimed at assimilating Indigenous peoples. Legislation such as the *Crown Lands Protection Act* (1839) classified Indian lands as Crown lands, and the 1850 Act introduced early definitions of "Indian" based on blood, which included Métis (Crown-Indigenous Relations and Northern Affairs Canada, 2017; Parrott, 2022). The *Gradual Civilization Act* (1857) offered land and incentives to those adopting a "civilized" life, followed by *the Indian Land Act* (1860) and the *Gradual Enfranchisement Act* (1869), which entrenched assimilation as federal policy and regulated identity, including gender-based provisions that enfranchised women who married non-Indigenous men, a practice that persisted until 1985 (Royal Commission on Aboriginal Peoples, 1996c; Assembly of First Nations, 2020a).

8.3.4.3.4 The Indian Act

The *Indian Act* of 1876 consolidated previous regulations and granted the Department of Indian Affairs broad authority over First Nations governance, land, resources, and identity, including defining “Status Indian” and mandating assimilation measures such as residential schooling (Crown-Indigenous Relations and Northern Affairs Canada, 2017). The Act excluded most Métis individuals from its provisions, narrowing definitions of “Indian” and introducing gender-based rules that removed status from women who married non-Indigenous men. These exclusions reduced land entitlements and facilitated settler expansion (Hayter, 2017; Teillet, 2013). Over time, amendments further entrenched control, with bans on cultural practices and restrictions on political and legal advocacy.

Although reforms began in 1951, allowing cultural practices and limited political rights, gender-based discrimination persisted until 1985, when Bill C-31 aligned the Act with equality rights under the charter. These amendments restored status to many women and their children but introduced new limitations, such as the second-generation cut-off, later addressed by Bill C-3 in 2011 (Assembly of First Nations, 2020a, 2020b). Enfranchisement (the loss of status through education, marriage, or other criteria) remained in effect until 1985, reflecting the Act’s long-standing role as a paternalistic and restrictive instrument of assimilation (Hanson, 2009a).

8.3.4.3.5 Treaties

Treaties were signed to enable settlement and resource development in western and northern Canada and to reduce conflicts between First Nations and settlers, gradually expanding Ontario’s land base after Confederation in 1867 (Archives of Ontario, no date; Crown-Indigenous Relations and Northern Affairs Canada, 2017). Although the Project is wholly contained within James Bay Treaty No. 9 boundaries, the Anishinaabeg and Omushkegowuk of the region are signatories to both the Robinson-Superior Treaty (1850) and Treaty No. 9 (1905), which form the basis for the Project’s consultation context (Crown-Indigenous Relations and Northern Affairs Canada, 2021, as cited in Tsuji and Tsuji, 2021).

The Robinson-Superior Treaty was signed in 1850 after Anishinaabeg requests for a treaty in the 1840s, prompted by mining activity and land pressures along Lake Superior (Hele, 2020). The treaty granted Canada access to lands for settlement and resource extraction in exchange for recognition of hunting and fishing rights, reserve lands, a one-time payment, and annuities with an escalator clause, which is currently the subject of an Ontario Superior Court case. While the Métis sought inclusion, they were excluded from treaty benefits, setting a precedent for their exclusion from Aboriginal rights in

Ontario (Teillet, 2013; Peressini, 2000). Covering the north shore of Lake Superior and lands to the Hudson Bay watershed, the Robinson treaties were the first to establish arrangements granting the Crown access to vast regions, contrasting with earlier treaties focused on smaller areas, and became a model for later agreements including Treaty No. 9 (Crown-Indigenous Relations and Northern Affairs Canada, 2013).

By the late 1800s, the Anishinaabeg and Omushkegowuk faced severe challenges including declining animal resources, starvation, disease, and pressures from poachers and prospectors, prompting calls for a treaty to secure protection and economic security (Archives of Ontario, no date). Negotiated in 1905 to 1906, Treaty 9 granted reserve lands, annuities, and hunting and fishing rights on unoccupied Crown lands, along with schools and symbolic items, while encouraging settlement and agriculture (Crown-Indigenous Relations and Northern Affairs Canada, 2017). The treaty process was shaped by Ontario's involvement and pre-set terms, with commissioners unable to alter conditions and failing to provide full translations or copies to signatories; oral promises emphasized cultural protection and continuity, but key clauses such as "Taken Up" were not explained (Archives of Ontario, no date; Tsuji and Tsuji, 2021). Considered one of the least generous numbered treaties, Treaty 9 covered most of Northern Ontario and later included adhesions in 1929 to 1930, yet historical records and oral histories reveal significant gaps between written terms and Indigenous understandings (Ojibway-Cree Cultural Centre, 1986; Long, 2010).

8.3.4.3.6 Damming and Diversion

Water that would normally flow to Hudson's Bay has been diverted over time through major damming projects to support shipping and hydropower in the Great Lakes region. Three key diversions, the Long Lake (1937), Ogoki (1940s), and Lake St. Joseph (1950s) projects, redirected water from the Albany River Watershed to Lake Superior and Lac Seul (Garrick, 2020; Creger, 2018). These diversions significantly altered natural water flows and impacted ecosystems and communities in the north. Concerns over further diversion in the 1960s led Nishnawbe Aski Nation leaders to organize opposition under the slogan "Damn the Dams" (Garrick, 2020).

8.3.4.3.7 The Reserve System

The reserve system, formalized under the *Indian Act,* drastically reduced the land base of First Nations, leaving the Anishinaabeg with only about 1 percent of their traditional territory and limiting Indigenous residents to occupancy rights while ownership and title remained with the Crown (Pitawanakwat, 2009; Smith, 2016). Although Treaty 9 initially allowed First Nations to choose reserve locations, this was overridden by Ontario, and

reserve sizes were often determined by inaccurate population data and settler demand. Reserves fragmented long-standing social networks and kinship systems, disrupting traditional hunting, fishing, and gathering practices, while amendments to the Indian Act imposed further restrictions, such as permits for selling goods (Hanson, 2009b; Smith, 2016). These changes contributed to poverty, loss of cultural continuity, and forced choices between remaining on reserves under restrictive conditions or leaving and facing discrimination and loss of status (Hanson, 2009b).

8.3.4.3.8 Residential School System

The residential school system, created under amendments to the Indian Act and operated by churches with government support, was designed to assimilate Indigenous children by erasing their languages, cultures, and identities (Hanson et al., 2020). From 1857 to 1996, more than 150,000 children, including those from Treaty 9 communities, were forcibly removed from their families and placed in schools far from home. These institutions imposed strict regimentation, banned Indigenous languages and practices, and punished children severely for cultural expression. Students were isolated from siblings, stripped of personal identity, and subjected to messages of inferiority, while education focused on manual labour and religious indoctrination rather than academics (Truth and Reconciliation Commission, 2015; Auger, 2005).

Conditions were overcrowded and unsanitary, leading to rampant disease and high mortality rates, while emotional, physical, and sexual abuse was widespread (Roman, 2013; Hanson et al., 2020). Survivors recall inadequate nutrition, poor medical care, and systemic neglect, with reports estimating that nearly one-quarter of previously healthy children died in these schools (Hanson et al., 2020). The legacy of residential schools includes profound intergenerational trauma, loss of language and culture, and long-term social and economic impacts, making the system one of the most destructive tools of colonial assimilation in Canada.

8.3.4.3.9 The Sixties Scoop

The Sixties Scoop refers to the widespread removal of Indigenous children, including Métis, from their families into the child welfare system, often without consent, beginning in the 1960s and continuing into the 1990s (Truth and Reconciliation Commission, 2015). Provincial social workers, applying mainstream standards and overlooking trauma from residential schools, placed thousands of children in foster care or institutions where abuse and neglect were common (Hanson, 2009c). Like residential schools, this practice caused cultural suppression and severe psychological and

emotional harm, with Indigenous children making up about one-third of those in care by the 1970s (Johnston, 1983, as cited in Hanson, 2009c).

8.3.4.3.10 The Constitution Act, 1982 and Aboriginal Rights

Between 1977 and 1981, constitutional reform excluded Aboriginal and Treaty Rights, but lobbying by Indigenous organizations led to Section 35 of the *Constitution Act*, 1982, which recognizes “existing Aboriginal and Treaty Rights” and defines Aboriginal peoples as First Nations, Inuit, and Métis (Crown-Indigenous Relations and Northern Affairs Canada, 2017). The scope of these rights remains largely defined by courts, with landmark cases such as R. v. Sparrow (1990) affirming that rights cannot be infringed without justification, and R. v. Van der Peet (1996) establishing criteria for identifying practices integral to Indigenous culture (Salomons and Hanson, 2009). Critics argue that the Van der Peet test is problematic because it frames Indigenous cultures as static and rooted only in the past.

8.3.4.3.10.1 Métis Rights

Métis rights were historically ignored, leaving communities vulnerable and often criminalized for subsistence activities like hunting and fishing (Teillet, 2013; Miner, 2022). Formal recognition came with Section 35 of the *Constitution Act*, 1982, and landmark cases such as R. v. Powley (2003) affirmed Métis harvesting rights and introduced the Powley Test to define who qualifies for these rights (Teillet, 2013). The 2016 Daniels versus Canada decision was pivotal because it confirmed that Métis and Non-Status Indians fall under federal jurisdiction as “Indians” under Section 91(24) of the *Constitution Act*, 1867, ending decades of jurisdictional uncertainty and enabling negotiations on land claims, self-governance, and access to federal programs (Roy, 2021). Despite these advances, ongoing debates about identity and exclusionary criteria continue to create tensions among Métis communities (Ouellet and Hanson, 2009).

8.3.4.3.11 Legislative Developments

8.3.4.3.11.1 Fish and Game Regulations

Initially, the Robinson treaties guaranteed Indigenous peoples unrestricted fishing rights, but by the late 19th century, federal and provincial legislation increasingly regulated these activities. The *Fisheries Act* (1857) and subsequent amendments restricted Indigenous fishing to domestic use only, introducing licenses, seasons, and conservation rules, while Ontario’s *Game and Fisheries Act* (1892) imposed hunting bans, quotas, and licensing requirements. Although early exemptions for treaty rights

existed, they were removed by 1927, leaving Indigenous hunters subject to all regulations, which severely limited their ability to harvest and maintain cultural practices. These restrictions, combined with enforcement and jurisdictional disputes, led to decades of conflict and hardship for Indigenous communities, prompting petitions and advocacy. While an interim enforcement policy in 1991 acknowledged treaty harvesting rights, the 1997 *Fish and Wildlife Conservation Act* failed to reference them, continuing a legacy of regulatory control over Indigenous subsistence and cultural lifeways (Hansen, 1991; Calverley, 1999).

8.3.4.3.11.2 The Registered Trapline System

The Registered Trapline System, introduced under Ontario's *Game and Fisheries Act* in 1946 and extended to the north by 1948, reorganized trapping territories into watershed-based units and imposed licensing, registration, and quotas unfamiliar to Indigenous trappers (Finch, 2020; AMEC, 2004b, as cited in Tsuji et al., 2011). While intended to address declining furbearing species and disputes over territory, the system disregarded Indigenous input on seasonal regulations suited to northern climates and coincided with broader changes such as new wildlife laws, wage labour opportunities, and disease outbreaks affecting key species (Sutherland, 2020). These measures disrupted traditional trapping practices and imposed regulatory frameworks that conflicted with Indigenous lifeways.

8.3.4.4 Cumulative Effects to Aboriginal and / or Treaty Rights and Interests

For roughly seven generations, colonial policies such as residential schools forcibly removed Indigenous children from their families, erasing languages, traditions, and cultural identities. These institutions caused intergenerational trauma, loss of parenting skills, and poor educational outcomes, while systemic messages of inferiority contributed to widespread despair. Combined with displacement from traditional lands and imposed governance systems, these actions fractured kinship networks and undermined cultural continuity, leaving lasting scars on Indigenous communities (Truth and Reconciliation Commission, 2015; Anishinabek Nation Legal Department, 2018).

The cumulative effects of these policies persist today, reflected in disproportionate rates of poverty, food insecurity, lack of potable water, and poor housing conditions on many reserves. Indigenous peoples experience higher rates of suicide, infant mortality, chronic disease, and incarceration compared to the general Canadian population (Smylie and Firestone, 2016; RCAP, 1996, as cited in Government of Canada, 2023a). Many survivors of residential schools were unprepared for participation in the market economy or traditional practices, and family connections were often permanently

broken. Despite these devastating outcomes, Indigenous peoples continue to reclaim their rights, restore cultural practices, and strengthen resilience within their communities.

8.3.4.5 Community Profiles

Community-specific profiles were provided for each Indigenous community in their Aboriginal and / or Treaty Rights and Interests: Impacts Assessment Report. To support a comprehensive regulatory review, these community-specific reports will be shared with the Regulator. They form part of the evidence base for determining the assessment outcome.

Due to confidentiality and / or the sensitive nature of the information, detailed community reports are not being shared publicly.

8.3.5 Acoustic and Vibration Environment

The acoustic, also known as noise, and vibration existing conditions are described in the following sections based on a combination of information obtained through desktop assessment and field investigations which took place in November 2019 using guidelines such as NPC-300 (Ontario Ministry of the Environment, 2013) and standards recognized worldwide by the International Organization for Standardization.

The complete description of acoustic and vibration existing conditions is documented in the Acoustic and Vibration Environment Technical Support Document (**Appendix P**).

8.3.5.1 Existing Potential Points of Reception

The study identified potential points where people might be affected by noise and vibration in the area. This was done using the NPC-300 guidelines (Ontario Ministry of the Environment, 2013), as well as engagement with the Community. Both existing and vacant lands were considered based on potential human use. Aerial photos and mapping data from Land Information Ontario (Ministry of Natural Resources and Forestry, 2026) and CanVec (Government of Canada, no date) were also looked at. These are called potential points of reception. There are 341 potential points of reception within Alternative 1 and 379 points of reception within Alternative 4. Indigenous Knowledge helped guide points of reception.

8.3.5.2 Noise

Two long-term monitoring sites were set up in the Community: Marten Falls 1 located in the central area of Marten Falls near the band office and the school and Marten Falls 2, located in a forested area near Marten Falls where human noise and their sources were considered low. These long-term sites were set up during a 48-hour period and had two timeframes for testing; daytime measured from 7 a.m. to 10 p.m. and nighttime from 10 p.m. to 7 a.m. To supplement the long-term monitoring program, seven short-term measurement locations were selected throughout the area of Marten Falls. Two locations were consistent with the locations of the long-term monitoring sites and the remaining five were selected throughout the community (e.g., near a school [Location ID SC5], an airport [Location ID SC7] and a healthcare centre [Location ID SC6]).

Table 8.3-4 summarizes the locations where the long-term monitoring and short-term measurements were carried out, which are shown on **Figure 8.3-8**.

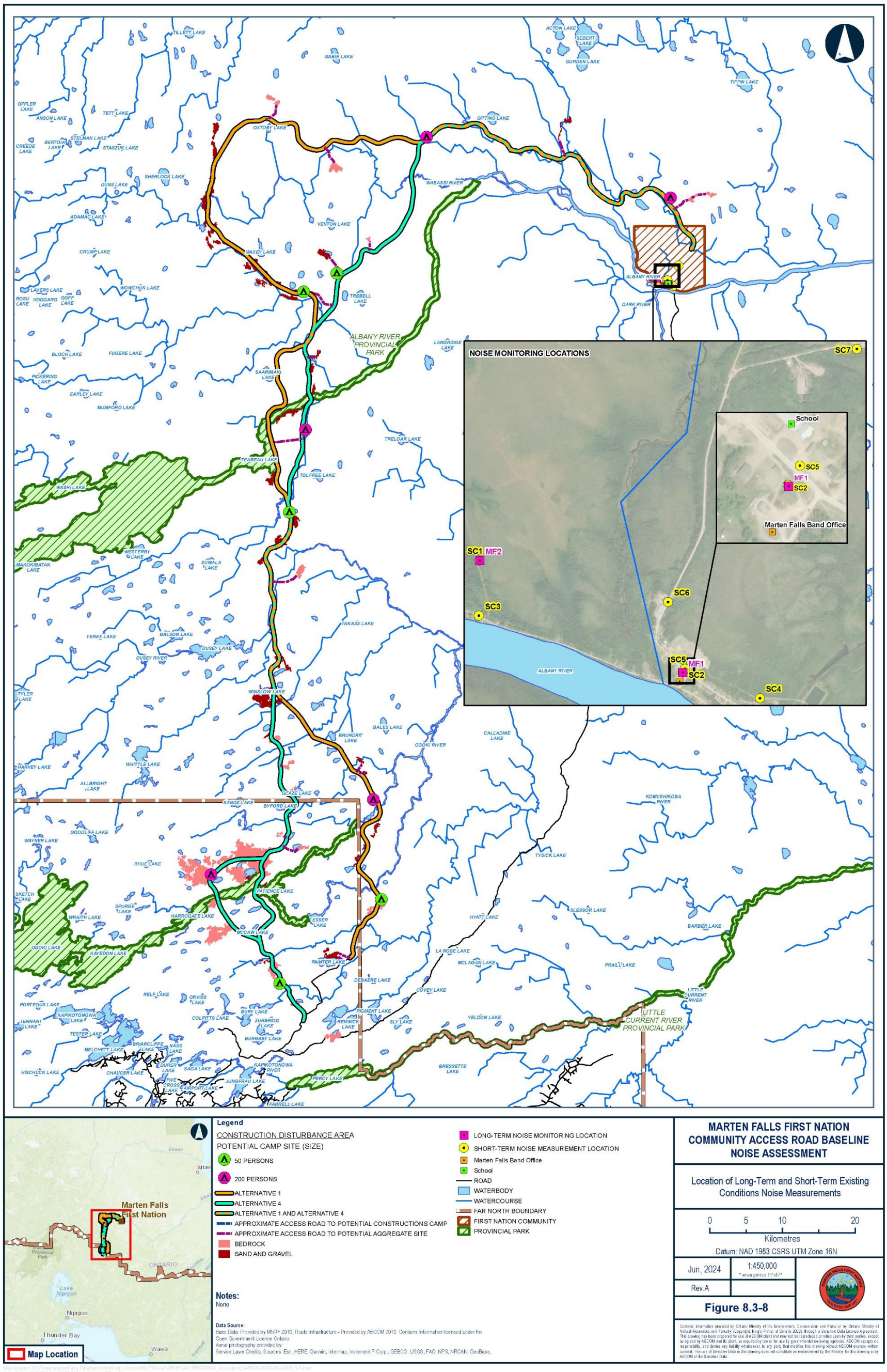
Table 8.3-4: Noise Monitoring and Measurement Locations

Monitoring / Measurement Location Identification	Duration	Coordinates UTM Zone 16U Easting (metre) (Footnote a)	Coordinates UTM Zone 16U Northing (metre)
MF1	Long-term (approximately 48 hours)	574261	5720776
MF2	Long-term (approximately 48 hours)	572613	5721684
SC1	Short-term (approximately up to 20 minutes)	572612	5721686
SC2	Short-term (approximately up to 20 minutes)	574260	5720778
SC3	Short-term (approximately up to 20 minutes)	572608	5721237
SC4	Short-term (approximately up to 20 minutes)	574886	5720568
SC5	Short-term (approximately up to 20 minutes)	574278	5720807
SC6	Short-term (approximately up to 20 minutes)	574140	5721348
SC7	Short-term (approximately up to 20 minutes)	575672	5723400

Footnotes: (a) UTM = Universal Transverse Mercator.

Monitoring Location MF1 was selected to characterize noise levels in a more populated area where it was expected ambient levels were influenced by human activities. The noise monitoring equipment was located in the central area of Marten Falls (in other words, near the band office and the school). The noise sources influencing the monitored noise levels at this location included: community activities, road traffic, animals (for example, dogs) and wind.

Figure 8.3-8: Location of Long-Term and Short-Term Existing Conditions Noise Measurements



Monitoring Location MF2 was selected to characterize noise levels in a more remote area, away from human activities, which is consistent with the majority of the acoustic and vibration environment existing conditions Local Study Area. The noise monitoring equipment was located in a forested area near Marten Falls with minimal influence of noise sources associated with human activities. The noise sources influencing the monitored noise levels included sounds of nature (in other words, wind in vegetation and wildlife).

The measured daytime and nighttime equivalent noise level and sound level exceeded 90 percent of the time are summarized in **Table 8.3-5** and **Table 8.3-6**. Results indicate a generally quiet environment where sources of noise include human activity, road traffic and animals.

Table 8.3-5: Monitoring Location MF1 Results – Community Noise Levels

Period	Average Leq (dBA) (Footnote a)	Average L90 (dBA) (Footnote b)
Daytime (7 a.m. to 10 p.m.)	43	38
Nighttime (10 p.m. to 7 a.m.)	42	35

Footnotes: (a) Leq = equivalent noise level; dBA = A-weighted decibel.
(b) L90 = noise level exceeded 90 percent of the time; dBA = A-weighted decibel.

Table 8.3-6: Monitoring Location MF2 Results – Remote Noise Levels

Period	Average Leq (dBA) (Footnote a)	Average L90 (dBA) (Footnote b)
Daytime (7 a.m. to 10 p.m.)	37	28
Nighttime (10 p.m. to 7 a.m.)	33	29

Footnotes: (a) Leq = equivalent noise level; dBA = A-weighted decibel.
(b) L90 = noise level exceeded 90 percent of the time; dBA = A-weighted decibel.

Table 8.3-7 summarizes the noise levels measured during the short-term measurements. The noise levels in the Community are usually between 22 to 38 a-weighted decibels, which means it is generally quiet with some noise from human activities. At one spot (SC2), the noise reached 50 a-weighted decibels during wind gusts. Another spot (SC7) near diesel generators had a noise level of 55 a-weighted decibels. In more remote areas, away from people, the noise levels are low and not affected by human activities.

8.3.5.3 Vibration

The current vibration levels are mostly caused by natural sources, with little to no human-made vibrations. So, in most of the Construction Disturbance Area, the vibration levels are very low (less than 0.1 millimetres per second), which is to be expected for rural and remote areas.

Table 8.3-7: Short-Term Measurements Results

Measurement Location ID (Footnote a)	Observations	Measurement Time	Measured Noise Level (dBA) Leq (Footnote b)	Measured Noise Level (dBA) L90 (Footnote c)
SC1	At MF2 in the morning, in general low noise levels with intermittent anthropogenic activity. Sources of noise included dog barking, snowmobile on road at a distance, birds, and some occasional wind gusts.	November 4, 2019 (morning period)	22	18
		November 5, 2019 (morning period)	23	17
		November 6, 2019 (morning period)	22	17
SC2	Near a school and community road. Noise sources included occasional wind gusts and trucks driving by (poor road surface conditions contributed to increases in noise levels due to road traffic).	November 5, 2019 (morning period)	50	32
SC3	Near the Community Access Road and river, south of MF2. Overall, a quiet noise environment. Low community background noise.	November 4, 2019 (morning period)	30	23
SC4	Northeast end of community. Low noise levels with few truck pass-bys. Minimal human activity with some background environmental noise (for example, dogs, birds, wind).	November 4, 2019 (afternoon period)	38	22
SC5	Near the school at MF1. Includes construction (renovation) noise from a roof of a nearby house and some human activity (for example, kids playing by the school yard).	November 4, 2019 (afternoon period)	38	32
SC6	Near a nursery. Noise sources include a low noise generator hum and some human activity. However, site is very quiet aside from human activity.	November 4, 2019 (afternoon period)	31	31
SC7	Near the airport and generator station. Noise sources include generator exhaust (dominant), truck pass-bys and some wind gusts.	November 5, 2019 (afternoon period)	55	53

Footnotes: (a) Refer to **Figure 8.3-15** for measurement locations.
(b) Leq = equivalent noise level; dBA = A-weighted decibel.
(c) L90 = noise level exceeded 90 percent of the time; dBA = A-weighted decibel.

8.3.6 Cultural Heritage and Archaeology

This section provides information on heritage features (both human-made and naturally occurring) that are important to Marten Fall First Nation and neighbouring Indigenous communities. These heritage features reflect the Indigenous and / or European history in the area.

Desktop research and field surveys were used to understand the history and cultural heritage of the Local Study Area. This included Indigenous Knowledge and input from community members. Primary sources like maps, drawings, and written accounts were used, along with scientific publications and previous reports. In July 2023, a field visit to Marten Falls was completed to discuss cultural heritage significance with community members and to take photos and notes of the area.

The complete description of cultural heritage existing conditions is documented in the Cultural Heritage Technical Support Document (**Appendix Q**).

Archaeology is also an important feature of cultural heritage. Stage 1 archaeological assessments explore and record the history and current conditions of an area. This information helps make recommendations about cultural heritage value, assessment and mitigation measures, and suggests strategies for protecting identified archaeological sites.

Documentary sources, Indigenous Knowledge, detailed mapping and satellite imagery were reviewed to evaluate the archaeological potential found within the study area. A helicopter flyover was completed on September 26 and October 4, 2019, to confirm existing conditions and areas of disturbance not visible in the mapping or satellite imagery within the Community Access Road study area. In 2023, additional lands were added to the archaeology study area to incorporate areas of temporary impacts including the extraction of aggregate resources to help build the Community Access Road that had not been looked at in the original Stage 1 Archaeological Assessment. A separate Stage 1 Archaeological Assessment, referred to as the aggregate resource study area, was completed.

The complete Stage 1 Archaeological Assessment is documented in the Archaeological Assessments Technical Support Document (**Appendix R**), which includes maps of the study area.

Stage 2 archaeological assessments help us understand if any resources are artifacts or archaeological sites with cultural significance.

The Stage 2 Archaeological Assessment was conducted between September 24 and October 4, 2019, and focused on the alternatives for the major river crossings and any specific locations that Marten Falls First Nation suggested. In discussion with Marten Falls First Nation, it was agreed upon that archaeologists would survey the areas within a 1-kilometre buffer from each of the proposed river crossing locations under consideration. A total of nine river crossings were identified to be completed during 2019; however, because of weather delays and timing, only two river crossings were assessed in 2019: Albany River crossing (WA-15) and Ogoki River crossing (WA-01).

The complete Stage 2 Archaeological Assessment is documented in the Archaeological Assessments Technical Support Document (**Appendix R**), which includes maps of the study area.

The Stage 1 and 2 archaeological assessment reports for the Community Access Road have been shared with neighbouring Indigenous communities, and feedback has been received from some communities.

8.3.6.1 Historical Context

8.3.6.1.1 Pre-Contact Overview of Northern Ontario

Archaeological research in Northern Ontario is less extensive than in southern Ontario, leading to a weaker understanding of the area's early settlement history. Poor soil conditions and fewer archaeological sites make it hard to pinpoint exact dates. Due to the tough landscape and limited known sites, the timelines for different archaeological periods in the north are approximate and often overlap. The following sections summarize the various cultures that have lived in Northern Ontario over the past 11,000 years, with **Table 8.3-8** offering a general timeline.

Table 8.3-8: Indigenous Cultural Chronology for Northern Ontario

Archaeological Period	Culture	Time Period	Characteristics
Paleo	Plano	Approximately 8,000 to 4,500 B.C.	• Lanceolate bifacial tools associated with large-game focused hunting; and • Sites often associated with relic lake shores north of the Upper Great Lakes.
Archaic	Shield	Approximately 5,400 to 250 B.C.	• Broad spectrum seasonal resource exploitation; • Development of environmental conditions similar to the present; • Slight reduction in group territory size; • Introduction of copper tools; • Highly mobile; • Introduction of bow and arrow technology; and • Domestication of dog.
Middle Woodland	Laurel	Approximately 700 B.C. to A.D. 1,000	• Introduction of pottery; • Introduction of horticultural production, primarily through trade; • Development of distinctive Algonquian ceramic styles; and • Large earthen mounds in some regions (for example, western end of Lake Superior).
Late Woodland	Blackduck Selkirk	Approximately A.D. 750 to 1,650	• Diverse ceramics – out-flaring vessel rims, textile impressions, and punctates; • Increasing variation in regional stylistic characteristics in various lithics and ceramics; • Evidence of extensive long-range Indigenous trade activities; • Communal burials; and • Direct ancestors of modern Indigenous communities.
Contact First Nations	Northern Ojibway	A.D. 1,600 to 1,875	• Early written records and treaties; and • Participation in fur trade.
Euro-Canadian	Not applicable	A.D. 1,749 to present	• European settlement (French and English).

8.3.6.1.2 Known Archaeological Sites

A search of the Ontario Archaeological Sites Database was completed in 2020 to see if there were any registered archaeological sites in or near the Local Study Area. Because the area is so large, the expanded search included sites within 50 kilometres of the boundaries. Four registered archaeological sites were found. **Table 8.3-9** gives more details about these sites.

Table 8.3-9: Registered Archaeological Sites within 50 kilometres of the Study Area

Borden #	Site Name	Cultural Affiliation	Site Type
EjIp-1	Marten (Martin's) Falls House	Indigenous, Euro-Canadian	Hudson's Bay Company fur trade post
EiIr-1	Baxter	Unknown	Unknown
EiIr-2	Twin Point	Unknown	Unknown
EgIk-1	Feldbruegge	Indigenous	Campsite

The Marten Falls House (EjIp-1) is on the southern bank of the Albany River at Marten Falls. Barry Newton found the remains of a Hudson's Bay Company fur trade post in 1975 as they were eroding from the riverbank. During the survey, the site was thoroughly examined, and two test pits were dug. Items found included ceramics, glass, metal hardware, household and personal items, animal bones, and Indigenous artifacts. This is the only known archaeological assessment of the site. It is believed that if the site were fully surveyed, it would be extensive due to its long period of occupation.

There are no other nearby sites because of limited development and natural water processes that have likely washed away other potential sites over time. Further archaeological details can be found in **Section 8.3.6.6**.

8.3.6.2 Post-Contact Overview of Indigenous History

Historical records by early European explorers and settlers only capture a brief moment in time regarding the movement of Indigenous people. These records do not reflect the full history of where Indigenous groups lived before or after European contact. Sometimes, what appears to be a movement of people was just a change in the name used for a group as they met different settlers.

This limited history can lead to misunderstandings. For example, it might seem like Indigenous groups only moved into an area during European exploration, but Indigenous oral histories and archaeological evidence show that pre-contact populations were very mobile and not tied to one place. Indigenous groups, languages,

and cultures were fluid across the landscape long before Europeans arrived. Even during the fur trade, the basic socio-cultural system of kinship-based land use remained intact.

At the time of European contact, Indigenous communities in Northern Ontario spoke variations of the Algonquian language group, such as Ojibway and Cree. The harsh environmental conditions in Northern Ontario, like forest fires and winter icing, affected how many people the region could support and how often they had to move. As a result, groups in Northern Ontario were small, mobile, and loosely connected (Dawson, 2004).

Additionally, the arrival of Europeans brought the influx of new diseases. Reporting and recordkeeping of the spread of disease was inconsistent at best but it is estimated that across North America as many as 20 million people, or 95 percent of the population, were killed (Ehrenpreis and Ehrenpreis, 2022).

8.3.6.3 Watercourse History

Waterways like the Albany and Ogoki rivers were crucial for local Indigenous people. They provided drinking water, fish, plants, and other essential resources. Rivers also served as transportation routes and attracted animals to their shores.

8.3.6.3.1 Albany River

The Albany River, at 982 kilometres long, is one of Ontario's longest rivers. It starts at Cat Lake, flows into Lake Saint Joseph, and eventually reaches James Bay (Kudelik, 2015). The river's watershed covers 135,000 square kilometres and includes major tributaries like the Ogoki, Kenogami, Cheepay, and Stooping Rivers (Mika and Mika, 1977). The Albany River forms the northern boundary of the District of Thunder Bay and flows through land shaped by ancient bedrock and glaciers, creating various landforms (Ontario Parks, 2025a).

The central part of the river is protected by Albany River Waterway Park, also known as Albany River Provincial Park. This park starts at Osnaburgh Lake and extends downstream to the Wabassi and Albany Rivers junction near Marten Falls (Kudelik, 2015; Ontario Parks, 2025a). The Local Study Area crosses the park just downstream from Teabeau Lake.

First Nations communities like Mishkeegogamang, Eabametoong, Kashechewan, and Marten Falls have a strong connection to the Albany River, using it for transportation, recreation, and subsistence fishing and hunting (Ministry of the Environment, Conservation and Parks, 1985). In the early 20th century, the river was a key

transportation route, especially during spring high tides (Long, 1985). Surveyor William McInnes noted that local Indigenous people caught plenty of Brook Trout and Sturgeon in the river's rapids (Bell, 1904). Today, recreational activities include camping, boating, swimming, and snowmobiling, with a winter snowmobile trail crossing the park between Marten Falls and Fort Hope (Ministry of the Environment, Conservation and Parks, 1985).

8.3.6.3.2 Ogoki River

The name "Ogoki" is Ojibway and likely comes from "ogaki," meaning "to reach a place before another" or "swift current" (Rayburn, 1997). The Ogoki River is part of the Albany River Watershed, starting between Lake St. Joseph and Lake Nipigon and flowing through various lakes and tributaries to meet the Albany River at Marten Falls. The river flows through land shaped by ancient bedrock, glaciers, wetlands, and uplands (Ontario Parks, 2025b).

The Ogoki River is an anastomosing river, meaning it has many connected wetlands, waterbodies, and channels. Parts of the river are protected by Wabakimi Wilderness Park and Ogoki River Waterway Park. Wabakimi Wilderness Park covers about 2,000 square kilometres of lake and river routes, including Wabakimi Lake, Whitewater Lake, and Whiteclay Lake (Ontario Parks, 2025c). Ogoki River Waterway Park covers the central part of the river, from just downstream of the Waboose Dam to the boundary between the District of Thunder Bay and the District of Cochrane. Portions of the Ogoki River Watershed are also protected by the Mojikit Lake Conservation Reserve, which straddles the watershed boundary of the Ogoki River and the Little Jackfish River.

The Local Study Area crosses the Ogoki Waterway Park at Patience Lake and the Ogoki River just downstream of the park's eastern boundary.

8.3.6.3.3 River Diversions

The Albany River Watershed has been heavily impacted by three historic dam projects, which continue to have social and environmental consequences. These projects were driven by federal and provincial authorities and private businesses, especially after Treaty No. 9 was signed in 1906 to promote industrial development in Northern Ontario (MacFarlane and Kitay, 2016; Tsuji and Tsuji, 2021).

Cedars Channel and Rat Rapids Dams: Built between 1934 and 1935 to power gold mines at Pickle Lake, these dams raised Lake St. Joseph's levels, flooding the Mishkeegogamang community and causing erosion and reduced water flow downstream (Mishkeegogamang, 2010; Ontario Power Generation, 2013).

Long Lake Diversion Dam: Constructed between 1937 and 1940, this dam diverted water from the Kenogami River to the Aguasabon River for a proposed pulp mill. It caused flooding and erosion at Long Lake No. 58 First Nation, and the rock used to control erosion was contaminated with arsenic (Annin, 2018; Peet and Day, 1980).

Ogoki River Diversion: Built between 1940 and 1943, this project diverted water from the Ogoki River to Lake Nipigon to boost hydroelectric power during WWII. It created the Ogoki Reservoir and caused significant ecological and social impacts (Rayburn, 1997; Annin, 2018).

These projects were done without consulting Indigenous communities, leading to severe impacts on fisheries, travel, and local ecosystems. Seasonal water level changes became more extreme, causing ecological instability and contamination, including mercury in fish (Annin, 2018; Indigenous Services Canada, 2025).

The dams also disrupted fish migration and spawning, reducing populations of key species like Sturgeon and Walleye. The long-term environmental effects are still not fully understood, and the dams have caused significant socio-economic costs for Indigenous communities, including loss of land and disruption of traditional activities (Day et al., 1982; Wilson and Haxton, 2021).

8.3.6.4 Post-Contact Historical Context

8.3.6.4.1 Early European Exploration

Europeans first arrived in Northern Ontario and Lake Superior in the early 1600s (Stuart, 2003).

The Albany River was one of the first rivers west of James Bay explored by Europeans. The French explored it between 1657 and 1751, and the British started trading there in 1668, building several forts (Newton and Mountain, 1980). The Hudson’s Bay Company, formed in 1670, had a monopoly on trade in the Hudson Bay area. They built many trading posts along the Albany River, competing with the Northwest Company until they merged in 1821, giving the Hudson’s Bay Company full control of the fur trade.

In the early 1900s, the Revillon Frères, a French fur trading company, set up a post on the Pagwa River to compete with the Hudson’s Bay Company. They operated in Canada from 1899 until the Hudson’s Bay Company bought them out in 1936 (Innis, 1930; Brill, 2012).

8.3.6.4.2 Henley House

The Hudson's Bay Company set up a sub-post on the north shore of the Albany River in 1720 to compete with French fur traders (Innis, 1930). Henley House, their first interior post, was fortified in 1741 to keep out French traders. It was attacked in 1755, rebuilt in 1759, and then rebuilt again in 1784 as a storage depot for Gloucester House (Long, 2010). Originally built on a gravelly island, Henley House was moved further south in 1796 to 1797 due to erosion.

By 1818, Henley House was less important than the Marten Falls Post but stayed operational until 1857 (Long, 2010). Archaeological surveys in the 1970s and 1980s found the fort, known as Henley House site (EhIb-3; Julig 1982). It is located on the north shore of the Albany River at the mouth of the Henley River and was the first interior fort built by the Hudson's Bay Company (Julig, 1988; Voorhis, 1930). This place is called Mamamattawa, meaning "meeting of waters" in Cree and Ojibway (Hudson's Bay Company Archives, B86/a/51, folio 25, August 19 to 22, 1796; Hudson's Bay Company Archives, B86/a/52, folio 6, October 2, 1796).

8.3.6.4.3 Gloucester House

Gloucester House was the furthest inland post of the Hudson's Bay Company on the Albany River. It was located on the northern shore of Washi Lake, just west of the Local Study Area in the District of Kenora. John Kipling and seven men established it in 1777 (Hudson's Bay Company Archives B78/a/2:4). They first built a temporary log tent, then a building with squared logs and a birch rind roof (Hudson's Bay Company Archives, B78/a/3:8). Between 1777 and 1818, they constructed 27 structures, 5 palisades, bake ovens, and charcoal kilns on the site (Newton and Mountain, 1980). Gloucester House also had a large boat-building program and operated shuttles between Gloucester House and Marten Falls (Newton and Mountain, 1980).

By 1795, Gloucester House's importance declined, and it was ordered to be abandoned and relocated to Ernest House (Marten Falls) (Hudson's Bay Company Archives, B78/a/22:16d). It was mostly abandoned until 1812, when it supplied an outpost at Attawapiskat Lake (Newton and Mountain, 1980). The Hudson's Bay Company permanently abandoned Gloucester House after 1818. In 1976, the Ontario Ministry of Culture and Recreation relocated the remains of Gloucester House, including two sets of structural remains and over 200 artifacts, to an unknown location (Golder, 2015).

A series of events, including changes in the trade market, environmental conditions, and competition between the Northwest Trading Company and the Hudson's Bay Company, influenced the establishment and operation of forts along the Albany River (Vyvyan,

1980). By 1821, after the two companies merged, the Hudson's Bay Company had exclusive control.

8.3.6.4.4 Marten (Martin's) Falls House

Marten Falls was likely named after Humphrey Marten, the manager of York Factory, a major Hudson's Bay Company post (Handfield and Handfield, 2020; Long, 2010). Some sources say it was established in 1782 as a temporary depot (Innis, 1930; Newton and Mountain, 1980), while others claim it was established in 1784 (Long, 2010) or even 1794 (Voorhis, 1930).

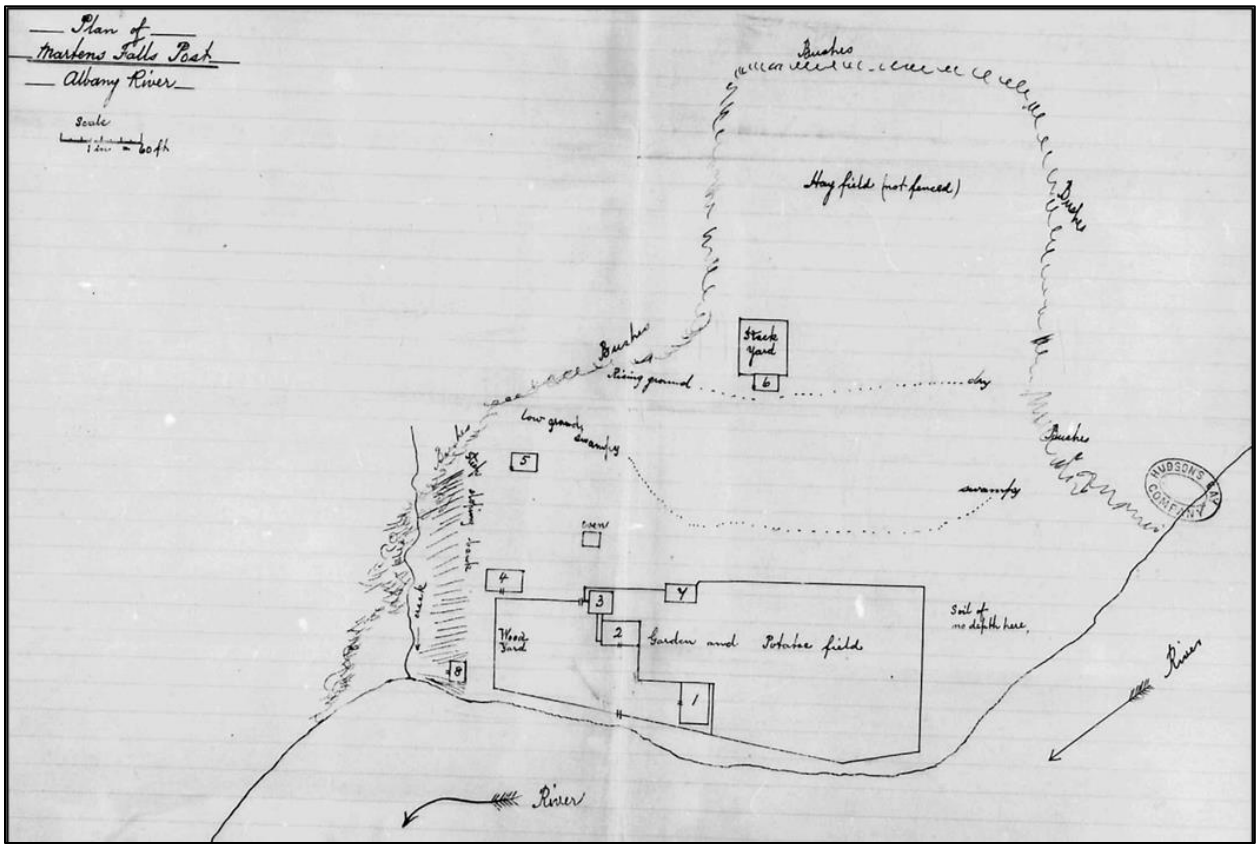
The post was renamed Ernest House around 1795, then closed in either 1799 or 1809, before reopening as Martin's Falls in 1818 due to increased fur trading (Long, 2010; Handfield and Handfield, 2020). It was closed again in 1924 and relocated to Ogoki Post, but the name Martin's Falls was still used for the post (Long, 2010).

The varied dates of opening, closing, and reopening reflect the changing conditions of the Hudson's Bay Company operations. The post was temporary at first, then maintained, closed, reopened, relocated, and renamed over time due to changes in the fur trade and local management.

Marten Falls Post had several notable managers. Jacob Corrigal, manager in the early 1820s, respected Indigenous hunters who prioritized fishing for their families. William MacKay, manager around 1869 to 1871, initially had contempt for Indigenous hunters but his views changed over time (Arthur, 1985). George Barnston, stationed at Marten Falls from 1834 to 1840, studied the environment and wrote about seasonal impacts on flora and fauna (Handfield and Handfield, 2020).

Turnips, hay, and potatoes were grown at Marten Falls Post, and cattle thrived there (Handfield and Handfield, 2020). An 1895 plan shows the post had several buildings, including a store, dwelling house, kitchen, cow shed, hen houses, shed, and potato vault, shown on **Figure 8.3-9**. About 5 acres were cleared around the post for a garden, potato field, wood yard, stack yard, and hay field (Hudson's Bay Company Archives B123/e/16 folio 1d, 2d).

Figure 8.3-9: Plan of Marten Falls Post, Albany River (1895)



Source: Hudson's Bay Company Archives, B123/e/16 folio 1d, 2d

The remains of the Marten Falls Post (EjIp-1) were located and subject to a limited Archaeological Assessment in 1975 by the Historical Planning and Research Branch of the Ontario Ministry of Culture and Recreation (Golder, 2015). The location of the former Marten Falls Post was east of the Local Study Area, in the District of Kenora.

8.3.6.4.5 Pagwa Post

In 1915, after the National Transcontinental Railway was completed from Quebec City to Winnipeg, the Revillon Trading Company sent a surveyor to check if the Pagwachuan River could be navigated from Pagwa to Fort Albany. The distance from Pagwa Post to English River Post (Mammamattawa) was about 137 kilometres (85 miles) to the south. Jean Romeo "Bob" Gauthier, the fur trade manager, built a combined house and store north of the railway and on the east side of the river, creating the Pagwa Post. His job included overseeing the construction of scows (flat-bottomed boats) and river transport (Brill, 2012).

Supplies from Fort Albany were delivered to Marten Falls on flat-bottomed river boats (Long, 2010). A map from the Hudson's Bay Company Archives dated March 1917

shows the Scow Route from Pagwa to Albany. The hand-written caption notes that supplies for Marten Falls Post were landed by Revillon Frères at “The Forks.”

8.3.6.4.6 District Organization and History

The Cultural Heritage Local Study Area includes parts of the Districts of Kenora, Cochrane, and Thunder Bay in Ontario.

District of Kenora: Kenora, once part of the Hudson’s Bay Company lands, is the largest district in Ontario by land mass. It includes the most northerly boundary of Ontario on Hudson Bay. The district is rich in resources, with numerous lakes and forests, and was historically travelled by fur traders. The construction of the Canadian Pacific Railway in the late 19th century led to European settlement and industrial growth, including sawmilling and gold mining. The population grew significantly, reaching nearly 22,000 by 1931. Today, Kenora District covers 395,432 square kilometres and has about 66,000 residents (Statistics Canada, 2023b).

District of Thunder Bay: Thunder Bay covers a large area in Northern Ontario, bordered by Lake Superior, Minnesota, Rainy River, Kenora, Algoma, and Cochrane. The district’s history includes early French exploration and fur trading, with Fort William established in 1679. The Canadian Pacific Railway brought settlers and industrial growth, including the paper industry and iron ore mining. The City of Thunder Bay was formed in 1970 from the amalgamation of several municipalities. The district is known for its scenic beauty and numerous lakes. It spans approximately 102,895 square kilometres and has a population of 146,862 (Statistics Canada, 2023b).

District of Cochrane: Created in 1921, Cochrane is named after Frank Cochrane, an early Ontario minister. It is bordered by James Bay, Quebec, Timiskaming, Sudbury, Algoma, and Thunder Bay. The district’s early history involves fur trading and the establishment of the Ontario Northland Railway, which facilitated mining and timber industries. Highway 11 is a major transportation route, connecting southern population centres like Timmins, Cochrane, and Kapuskasing. Cochrane District covers about 139,784 square kilometres and has a population of 77,963 (Statistics Canada, 2023b).

8.3.6.5 Treaty No. 9 (1905 to 1906 and 1929 to 1930)

The Local Study Area is within the region covered by Treaty No. 9 (James Bay Treaty) and the Treaty 9 Adhesions made in 1929 to 1930. Treaty No. 9 encompasses land in Northern Ontario, north of the Robinson-Superior and Robinson-Huron Treaties of 1850, extending to the Quebec border in the east, Treaty 3 territory in the west, and Hudson Bay and James Bay in the north. The treaty was created without Indigenous input, and many signatories could not read or write in English, leading to misunderstandings

(Morrison, 1986). The treaty commissioners presented an incomplete draft to Indigenous signatories, which was later backdated by government officials (Tsuji and Tsuji, 2021). Misleading oral promises were made to Indigenous leaders, who believed signing the treaty would help preserve their traditional ways of life (Archives of Ontario, no date).

Treaty No. 9 was first signed in 1905 between various Northern Anishinaabe (Ojibway), Cree (including the Omushkegowuk), other Indigenous communities (Algonquin), and the Crown. Commissioners Duncan Campbell Scott, Samuel Stewart, and Daniel George MacMartin travelled to Northern Ontario, visiting Hudson's Bay Company posts at Osnaburgh, Fort Hope, Marten Falls, English River, Fort Albany, and Moose Factory, ending their trip at New Post (Long, 2010).

By 1902, Revillon Frères was competing with the Hudson's Bay Company at many trading posts in Northern Ontario. The Hudson's Bay Company controlled the geographical scope of the treaty, giving them an economic advantage (Long, 2010). They played a crucial role in negotiating Treaty No. 9, and almost every original reserve location was near a Hudson's Bay Company post, benefiting the company economically and politically. Indigenous groups near these posts had close economic and social ties due to the fur trade (Calverley, 2006).

Treaty No. 9 allowed Indigenous signatories to hunt, trap, and fish throughout the tract, subject to government regulations, except for areas needed for settlement, mining, lumbering, trading, or other purposes (Long, 1978). However, Indigenous interests were often subordinated to business and state interests. For example, no reserve lands were located on potential water-power generation sites, allowing for dam development on the Albany and Moose River watersheds without consulting local Indigenous communities (Tsuji and Tsuji, 2021).

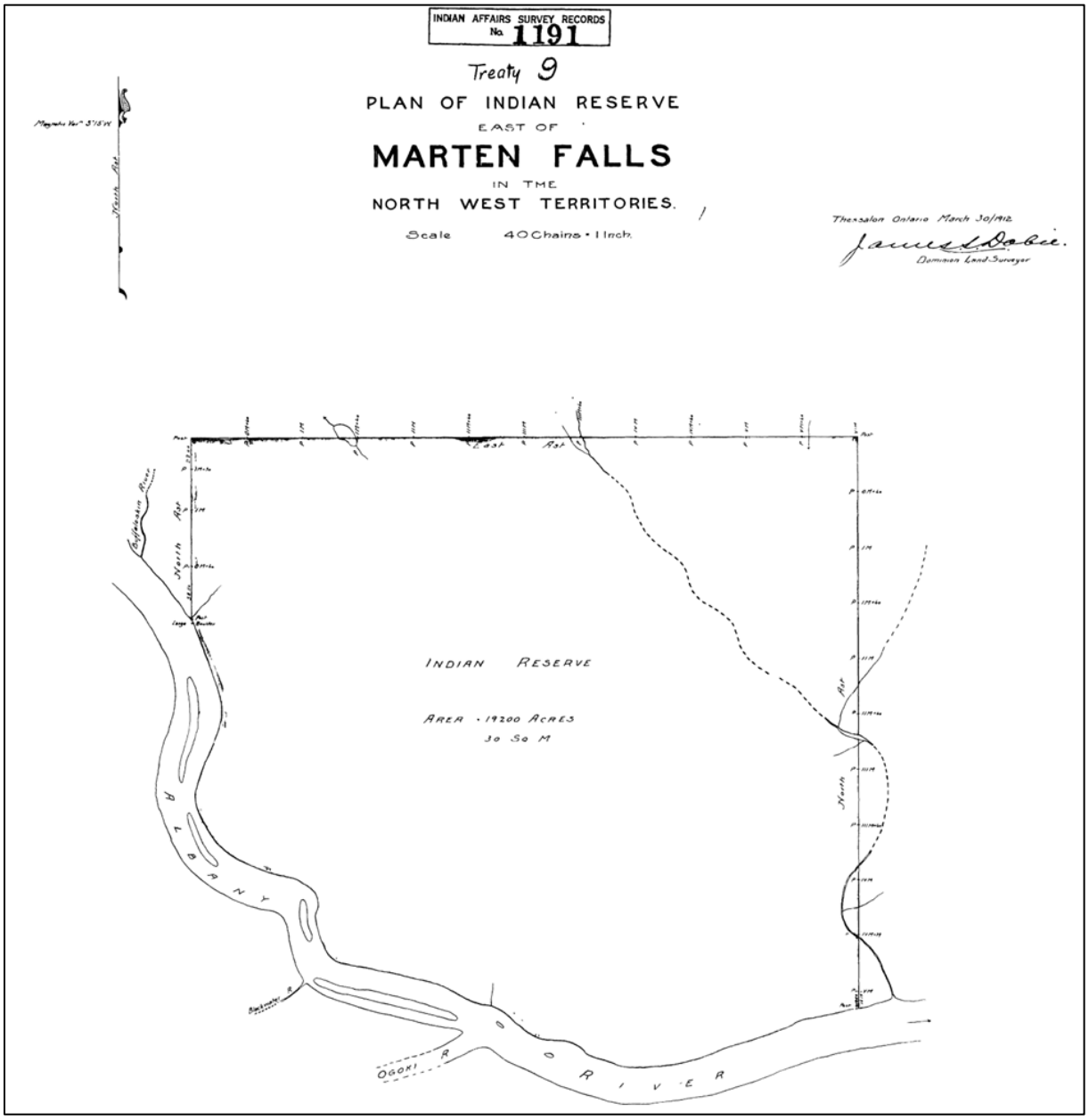
8.3.6.5.1 Treaty No. 9 – The Formation of Marten Falls Reserve

In 1905, the Marten Falls Post hosted one of the Treaty No. 9 signing events (Long, 2010; Vyvyan, 1980). The treaty commissioners considered Marten Falls less important compared to other Hudson's Bay Company posts like Osnaburgh or Fort Hope (Long, 2010). At the time, MacMartin described the post as being on a high clay bank with fertile soil and a well-cultivated garden (Long, 2010).

The Marten Falls band, now known as Marten Falls First Nation, was recognized by the treaty commissioners in 1905 (Long, 2010). They elected William Whitehead as Chief and two councillors, William Coaster and Long Tom Oatsames (Long, 2010). Reserve sites were chosen during negotiations and later confirmed by a government surveyor and the local Hudson's Bay Company post manager (Calverley, 2006).

In 1911, surveyor James S. Dobie travelled to Marten Falls and met with the Chief and councillors. They wanted the reserve on the Albany River, opposite the Ogoki River, due to the wet and timberless land described in the treaty. Dobie confirmed their claims and surveyed the reserve further down the Albany River (Dobie, 1911). The survey was completed on August 5, 1911, and Dobie noted the land's potential for cultivation with proper drainage (Dobie, 1911) (**Figure 8.3-10**).

Figure 8.3-10: Treaty 9 Plan of Marten Falls Reserve (Dobie, 1911)



Source: Crown-Indigenous Relations and Northern Affairs Canada

The Ontario *Boundaries Extension Act* of 1912 added the Patricia Portion (land north of the Albany River) to Ontario. Indigenous peoples petitioned for a treaty to protect their lands from development. Initially, there were no plans to build a railway or extend Treaty 9, but by the 1920s, the federal government focused on resource development. Mining activities north of the Albany River led to the Treaty 9 Adhesions in 1929 to 1930, adding more communities as signatories (Long, 1978).

The Marten Falls community existed for over 250 years before the post closed in 1924. The Community relocated to their current reserve location, as shown in Dobie's 1911 survey. The Hudson's Bay Company moved the post downriver to Ogoki in 1924 to compete with Revillon Frères at Pagwa Post (Long, 2010).

8.3.6.5.2 Government Policy and Indigenous Communities After Treaty No. 9

In 1922, Dr. Peter H. Bryce exposed unhealthy conditions in residential schools and advocated for Indigenous self-reliance through agriculture. His report was downplayed by the Department of Indian Affairs (Long, 2010). The government enforced a sedentary lifestyle and dependence on government support, ending traditional Indigenous mobility by 1930 (Wightman and Wightman, 1997).

In the 1960s, protests led to the construction of schools near Hudson's Bay Company posts, resulting in permanent settlements (Driben and Trudeau, 1983). The 1969 "White Paper" aimed to assimilate Indigenous peoples but faced strong opposition and was withdrawn, though some policies were implemented (Driben and Trudeau, 1983).

Skills development programs in the 1960s and 1970s aimed to prepare Indigenous people for urban jobs (Driben and Trudeau, 1983). Government-controlled job creation programs led to mismanagement and dependency (Driben and Trudeau, 1983). Welfare programs promoted government dependency rather than economic independence (Driben and Trudeau, 1983). The Report of the Royal Commission on Aboriginal Peoples (Royal Commission on Aboriginal Peoples, 1996d) and the United Nations Declaration on the Rights of Indigenous Peoples (Office of the United Nations High Commissioner for Human Rights, 2013) emphasize Indigenous self-determination and autonomy.

8.3.6.5.3 Trapping and Traplines

Early Indigenous societies relied on seasonal campsites for hunting and trapping, moving with the availability of fish and game (Driben and Trudeau, 1983). The Indigenous groups partnered with French fur traders in the 18th century, moving north to trade and trap (Driben and Trudeau, 1983). The 1821 merger of the Northwest

Company and Hudson's Bay Company reduced competition and autonomy for Indigenous trappers (Finch, 2020).

Ontario annexed lands north of the Albany River in 1912, introducing game laws that affected Indigenous trappers). The Registered Trapline System, introduced in 1948, aimed to control wildlife populations but faced resistance from Indigenous communities. By the 1960s, new wildlife laws and wage labour opportunities reduced Indigenous harvesting (Finch, 2020).

The 1999 Agreement on International Humane Trapping Standards added restrictions to the fur trade, impacting Indigenous trappers (Environment and Climate Change Canada, 2022a).

8.3.6.5.4 Mining and Lumber

The fur trade in Northern Ontario declined in the late 19th and early 20th centuries, this decline corresponded with an increase in other extractive activities. Due to the introduction of railways, prospectors and surveyors eager to extract resources from the previously isolated region had increasing access to Northern Ontario (Calverley, 2006). Provincial explorer E.B. Borron conducted mineral reconnaissance until Ontario created its Bureau of Mines in 1892 (Wightman and Wightman, 1997). In 1899, Ontario evaluated resources north of the Canadian Pacific Railway, highlighting potential in lumber and mining (Wightman and Wightman, 1997).

Federally, Robert Bell of the Geological Survey of Canada explored Northern Ontario for minerals, noting Indigenous trails during his 1886 exploration of the Attawapiskat and Albany Rivers (Wightman and Wightman, 1997). Bell's observations were included in the Report of the Bureau of Mines, 1912, Volume 21, detailing trails leading to Marten Falls trading post (Miller, 1918).

8.3.6.5.5 The Métis in Northern Ontario

In the late 1650s, French fur traders began marrying Indigenous women in the Upper Great Lakes Region, creating family ties that helped maintain trade relationships and gave rise to a Métis population (Gale, 2005). By the 19th century, Métis people were crucial to the Hudson's Bay Company, making up nearly 70 percent of its labour force in the Lake Superior area (Gale, 2005). They held important roles, such as George McPherson, who managed posts at Marten Falls and Osnaburgh (Arthur, 1985).

The Hudson's Bay Company viewed "Indian" identity based on cultural traits rather than race, distinguishing those raised in the forest from those brought up at company posts (Arthur, 1985). The term "Métis" was not always used in Northern Ontario, where mixed Indigenous-European ancestry was common (Long, 2010).

In the 1800s, these Métis communities in Northern Ontario asserted their collective identity, rights, and interests through political action and advocacy, including the 1849 Mica Bay Incident, Métis petitions from Moose Factory in 1893 and 1905, and the negotiation of a collective Métis adhesion to Treaty 3. These historic Métis events in Ontario have long been recognized, including by the Royal Commission on Aboriginal Peoples (Royal Commission on Aboriginal Peoples, 1996a, 1996b, 1996c).

Métis people tried to be included in the initial signing of Treaty No. 9, but the commissioners had no instructions for handling their claims (Calverley, 2006; Long, 1985). In 2003, the Supreme Court of Canada ruled in R. v. Powley that "Métis" refers to distinctive peoples with their own customs and identity, establishing criteria for Métis rights (Powley decision). This decision raised awareness of Métis communities in Ontario and laid the groundwork for discussions on Métis self-determination.

8.3.6.6 Archaeology Existing Conditions

The Archaeology Local Study Area is mainly within the traditional territory of Marten Falls First Nation and other Matawa First Nation Communities. These lands stretch from the Current River and Ogoki Lake in the south to Makokibaton Lake in the west, Jasper Lake and Muketei Rivers in the north, and Albany Forks in the east. Marten Falls Indian Reserve 65, also known as Ogoki Post, is a remote community accessible year-round by air or by ice road in winter (Marten Falls First Nation, 2014).

Aroland First Nation Reserve is about 50 kilometres south of the Local Study Area. Discussions are ongoing between Marten Falls First Nation and Aroland First Nation about their traditional territories, which overlap in the Local Study Area. Aroland First Nation is an Ojibway and Oji-Cree community on the Kowkash River, with members from various First Nations, including Marten Falls First Nation (Baldwin, 1957).

Eabametoong First Nation, also known as Fort Hope, is an Anishinaabe community about 70 kilometres west of the study area on the north shore of Eabamet Lake. The Eabametoong reserve was set aside during the signing of Treaty No. 9 in 1905, although it was mistakenly combined with three other groups (Jacasum, 2006).

8.3.6.6.1 Stage 1 Archaeological Assessment

Additional archaeological investigations have been undertaken in the broader region, including extensive surveys along portions of the Albany River System. Patrick J. Julig completed surveys of the lower Albany River, identifying 20 pre-contact Indigenous sites and several historic encampments (Julig, 1982). These surveys have demonstrated the rich archaeological record of the region, including several thousand years of

Anishinaabe occupation. Golder Associates Ltd. (Golder) has completed several archaeological assessments in the Regional Study Area, notably for the Cliffs Natural Resources Integrated Transportation System between the mine site and the proposed Cavell Transload Facility, as well as for the Cliffs Natural Resources proposed pits and quarries (Golder, 2015). Both archaeological assessments determined that archaeological potential exists for pre-contact Indigenous and historical sites within their respective study areas, particularly along waterways bordered by reasonably drained soil or bedrock and by historical transportation routes, and these areas were recommended for Stage 2 Archaeological Assessment prior to any additional development in those areas (Golder, 2015). **Table 8.3-9** outlines the known archaeological sites within the area.

The Stage 1 Archaeological Assessment determined that the potential for the recovery of archaeological resources is high, given the proximity of the Community Access Road study area to suitable water and food resources, areas of interest provided by Marten Falls First Nation, and previous archaeological assessments and archaeological research that have identified archaeological potential.

8.3.6.6.2 Stage 1 Archaeological Assessment – Aggregate Resources

Background research was completed for the natural environment surrounding the area where aggregate resources will be used. The Stage 1 Archaeological Assessment of the aggregate resource study area determined that the potential for the recovery of archaeological resources is high, since it is close to suitable water and food resources, areas of interest provided by Marten Falls First Nation, and previous archaeological assessments and archaeological research that have identified archaeological potential.

8.3.6.6.3 Stage 2 Archaeological Assessment

A Stage 2 Archaeological Assessment was completed in 2019 for areas identified as retaining archaeological potential within both Albany and Ogoki river crossings (WA-15 and WA-01). The Stage 2 Archaeological Assessment was completed in accordance with Section 2.1.5 of the Standards and Guidelines for Consultant Archaeologists (Government of Ontario, 2011), for special survey conditions in Northern Ontario and on Canadian Shield terrain. A physical inspection was completed by walking within the areas identified as retaining potential. Beach surveys and subsequent test pits were completed in these areas, given that they were not too wet or steeply sloped. All areas within 50 metres of the shoreline were surveyed at a minimum of 5 metre intervals, while all areas beyond 50 metres from the shore were test pitted at 10 metre intervals,

with the archaeologist's judgement (Government of Ontario, 2011). Areas beyond 150 metres of the shoreline or archaeological features were not surveyed.

Each test pit was at least 30 centimetres in diameter and all soil was screened though hardware mesh, 6 mm in size, to facilitate the recovery of cultural material. All test pits were examined for stratigraphy, cultural features or evidence of fill. Intact test pits consisted of a humic layer approximately 10 to 20 centimetres thick, followed by a thin lens of grey silty loam (leach layer), a thin black organic layer, and a brown / orange silty loam over a white silty loam subsoil. The steeply sloped areas, including the wooded area and areas of low and wet conditions, were photo-documented and were not subject to Stage 2 test pit survey. Photograph locations and directions are provided in the Stage 2 Archaeological Assessment in **Appendix R.**

A total of nine river crossings over the Ogoki and Albany Rivers were subjected to a Stage 2 Archaeological Assessment. Due to unfavourable weather conditions and the evolving COVID pandemic, much of the field work was suspended for the remainder of 2019. Therefore, only two of the nine river crossings were assessed in the fall of 2019, these being alternatives under consideration for the major river crossings: the Albany River crossing (WA-15) and the Ogoki River crossing (WA-01). These areas were specifically targeted to help inform bridge design, as discussed with the Project Team and in consultation with the Marten Falls Community-Based Land Use Project Team. At each of the river crossings, a 1-kilometre buffer was applied to the proposed bridge location and all areas identified as retaining archaeological potential were subject to Stage 2 Archaeological Assessment.

A total of five areas of interest were identified during the Stage 2 survey of the two assessed river crossings, referred to as Locations 1 to 5. After laboratory analysis, it was determined that Location 4 and Location 5 did not consist of culturally modified material, leaving just Locations 1 to 3 to be physically inspected, details in **Table 8.3-10** include the artifacts that were found.

Table 8.3-10: Artifact Catalogue

Location	Artifact	Quantity	Morphology	Chert	Comments
1	Chipping Detritus	1	Primary	Hudson's Bay Lowland	Cortex present
2	Biface	1	Not applicable	Hudson's Bay Lowland	Cortex present; late-stage biface
3	Chipping Detritus	1	Secondary	Hudson's Bay Lowland	Possible edge retouch, though difficult to tell because of bashing

Location 1, found at the Albany River crossing (WA-15), contained a single piece of chipping detritus made from Hudson's Bay Lowland chert. This artifact, created by pre-contact First Nation people, does not provide enough information to determine a specific time period or cultural group. Due to its isolated nature and lack of additional information, Location 1 was deemed to have no further cultural heritage value or interest according to the Standards and Guidelines for Consultant Archaeologists (Government of Ontario, 2011). Therefore, no further work is recommended for this site.

Location 2 is a campsite on the east boundary of the 1-kilometre buffer around Albany River crossing (WA-15). The site includes a can and bottle dump, an outhouse, cooking areas, utensils, and remnants of tent structures and boat tie-ups. GPS coordinates and photos were recorded for all features, but nothing was collected.

A circular biface made from Hudson's Bay Lowland chert was found at this location. It has visible cortex on some lateral edges and is in the late stage of manufacture, indicating it was being shaped into a tool pre-form (Fisher, 1997). A member of Marten Falls First Nation confirmed that this area was once used as an ice fishing camp.

The occupation timeline in Northern Ontario is later than other parts of the province due to its remote nature. It remained largely untouched by modern development until the 20th century, with the fur trade being one of the few sources of settlement. Campsites from the mid-20th century in this region are archaeologically significant because they represent major periods of change, with many communities remaining mobile until then.

Location 2 is a culturally significant all-season fishing / outpost campsite used throughout the 20th century and possibly earlier. Although the deposit mainly consists of 20th-century material, the site's remote nature and its location on a major northern thoroughfare indicate it retains cultural heritage value. Location 2 has been registered with the Ministry of Citizenship and Multiculturalism as the Caviar (EiIp-1) site.

Location 3, found at the west end of the 1-kilometre Community Access Road study area around the Ogoki River crossing (WA-01), contained an isolated secondary flake of Hudson's Bay Lowland chert on exposed bedrock near the rapids. This suggests the area might have been used for stone tool creation due to the abundance of cobble chert along the shoreline. However, the flake likely was not in its original context, as it was found among other river pebbles, probably due to low water levels in the fall. It is more likely that stone tool manufacturing occurred upriver, and the pieces were discarded into the river and later exposed.

Given the isolated nature of the find and the lack of temporal or cultural information, Location 3 was deemed to have no further cultural heritage value or interest according

to the Standards and Guidelines for Consultant Archaeologists (Government of Ontario, 2011). Therefore, no further work is recommended for this site.

8.3.6.7 Cultural Heritage Existing Conditions

Traditional Knowledge was gathered through community engagement and the Indigenous Knowledge data collection program with Marten Falls First Nation and identified where heritage features are likely to exist. The possible locations of both human-made and naturally occurring heritage features were complimented by background research. These background documents include map information, and a Land Use and Occupancy Study for North Access Roads provided by Marten Falls First Nation.

These cultural features were used to create a heat map, which shows areas where the greatest density of heritage sites is known to exist. The heat map was an important tool in the selection of a preferred route, where an ideal route will maximize benefits to the Community and reduce impacts to culturally important sites. Although it is recognized that while counting culturally important areas is an important first step, this approach cannot fully-account for Indigenous Land Use and Knowledge in the Local Study Area. The Proponent team will continue to work with members of Marten Falls First Nation to determine culturally important areas rather than relying on the standard procedures to document existing conditions as prescribed by the province. **Table 8.3-11** and **Figure 8.3-11** to **Figure 8.3-15** provide a summary of Indigenous Knowledge data points relevant to built heritage resources and cultural heritage landscapes within and adjacent to the Local Study Area.

Table 8.3-11:Inventory of Built Heritage Resources and / or Cultural Heritage Landscapes within and adjacent to the Local Study Area

Resource Type	Number of Data Points	Description / Comments
Harvest Areas	149	• Animal Harvest Areas including: – Hunting areas for large mammals such as Black Bear, Moose, Caribou, and Deer; – Trapping areas for small furbearing animals including Beaver, Moose, Caribou, Muskrat, and Rabbit; – Hunting areas for birds such as Geese, Partridge, and Ptarmigan; and – Hunting camp sites. • Fish Harvest Areas including: – Fishing areas for: Mackerel, Pickerel, Pike, Brook Trout, Speckled Trout, and Sturgeon; and – A stone weir (fishing basket). • Plant Harvest Areas including: – Fruit-producing plant species including Wild Blueberries, Strawberries and Gooseberries; and – Tree species including Cedar, Aspen, Poplar, Jack Pine, and Tamarack.
Cultural, Spiritual, and Sacred Areas	49	• Cultural, Spiritual, and Sacred Areas including: – Traditional gathering areas; – Sacred and Spiritual sites; – Birth, death, and burial sites and cemeteries; – Euro-Canadian historical sites including the location of the Marten Falls Hudson's Bay Company Post, trading posts, and a former Anglican Church; and – The site of the signing of Treaty No. 9 in 1905.
Habitation Areas	90	• Habitation Areas including: – Cabin and campsite locations, including mining camps and trading posts associated with European-Canadian uses; – Tourist camps; – Location of the original Marten Falls settlement and the Marten Falls Fort; – Historical Villages; and – Areas associated with early European trade and settlement identified on historic maps (such as Hudson Bay Company posts).
Travel Routes	23	• Travel and Transportation Routes including: – Portage sites / routes; – Skidoo / Snowmobile Trails and Winter Roads; and – Albany and Ogoki rivers and waterways.

Figure 8.3-11: Heat Map – All Cultural Heritage Categories

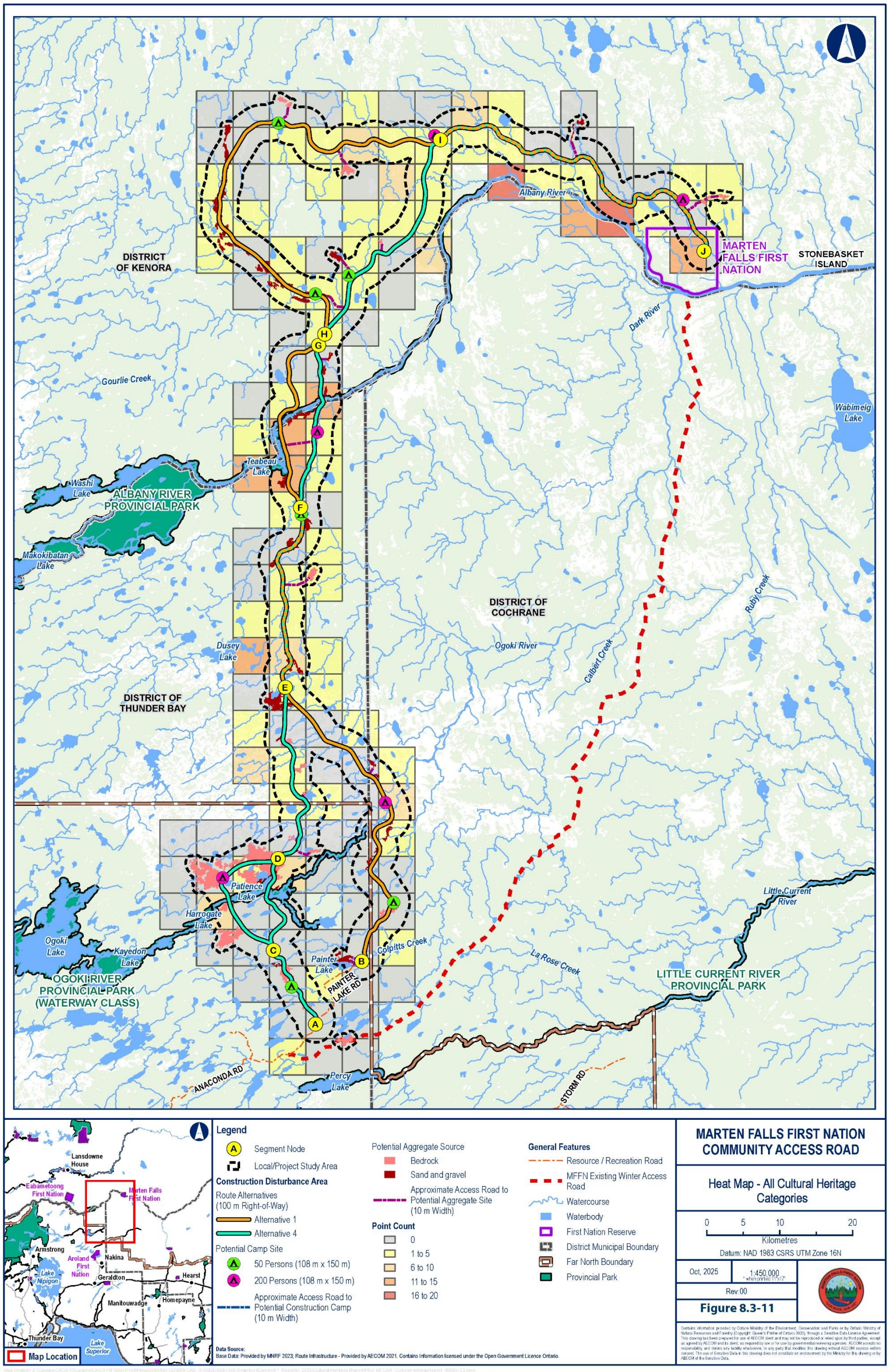


Figure 8.3-12: Heat Map – Harvest Areas

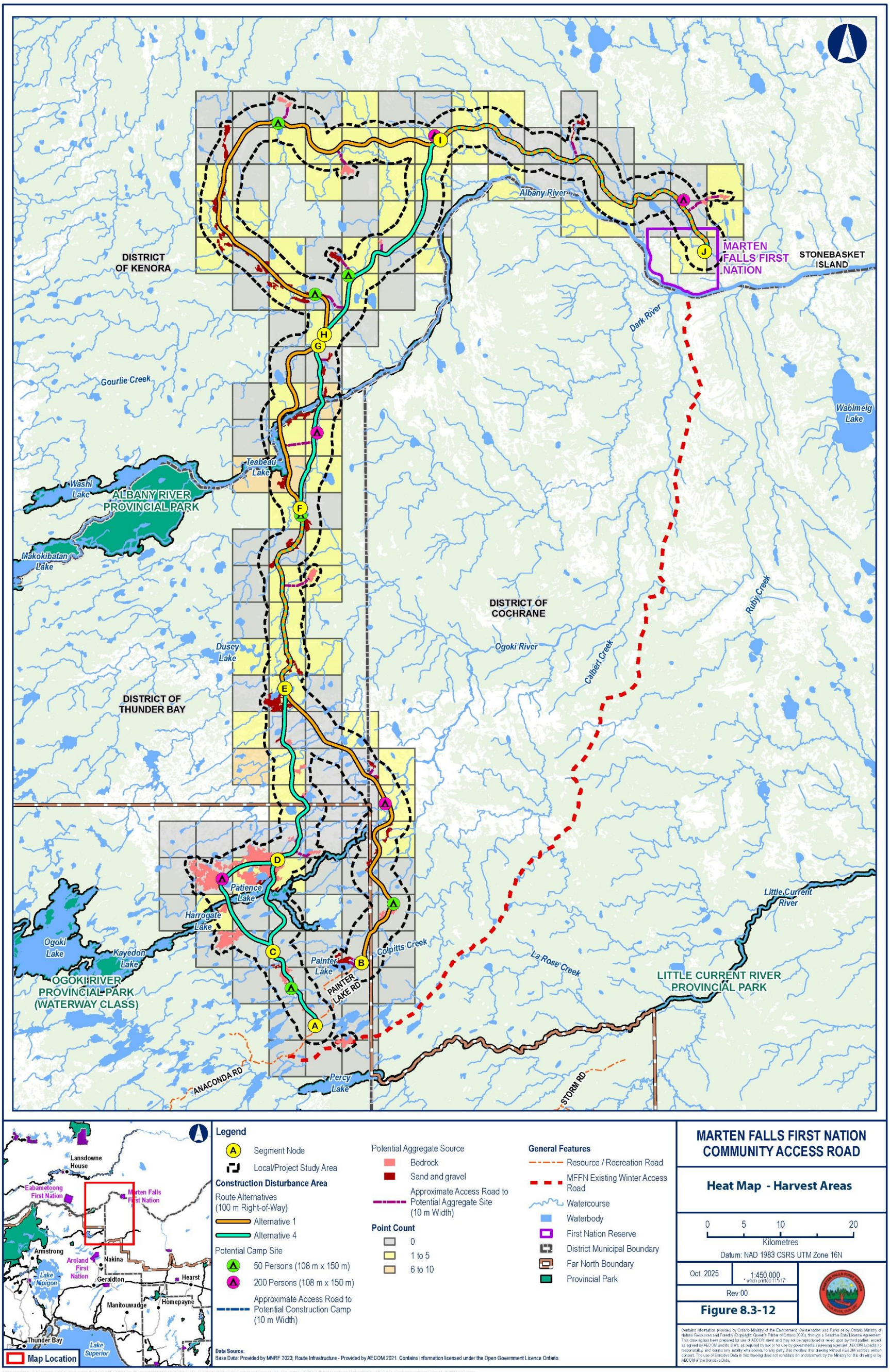


Figure 8.3-13: Heat Map – Cultural, Spiritual, and Sacred Areas

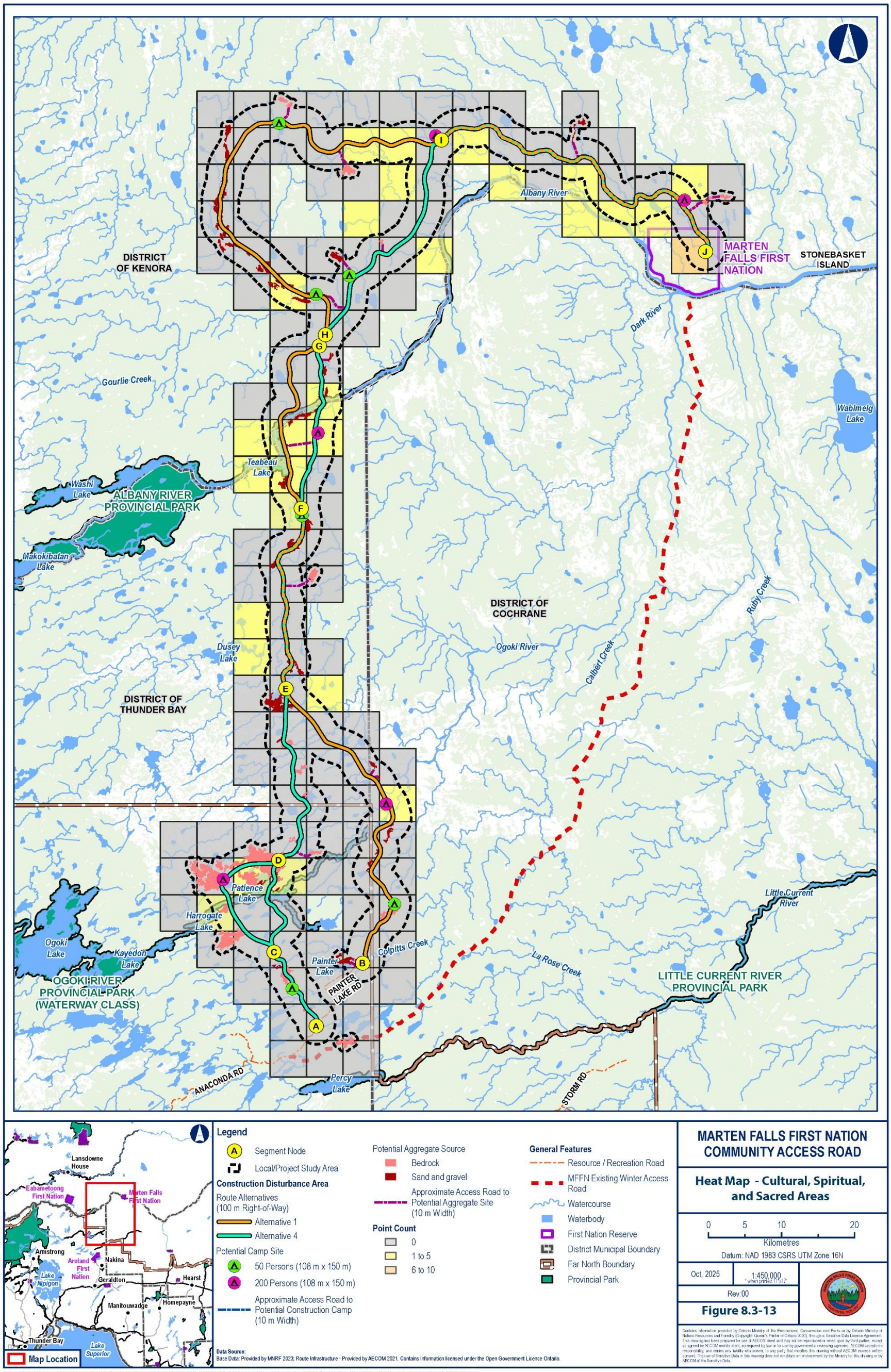


Figure 8.3-14: Heat Map – Habitation Areas

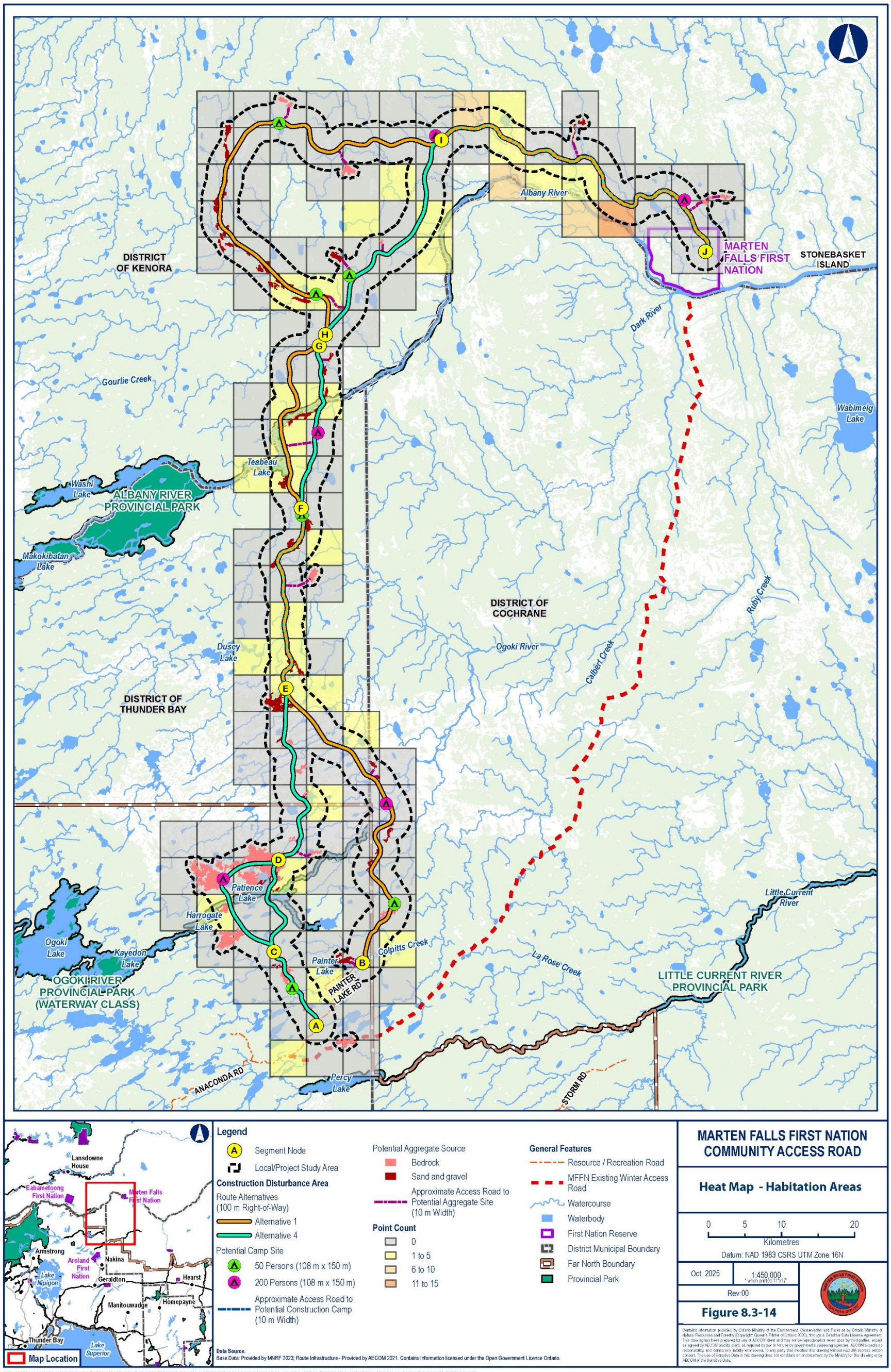
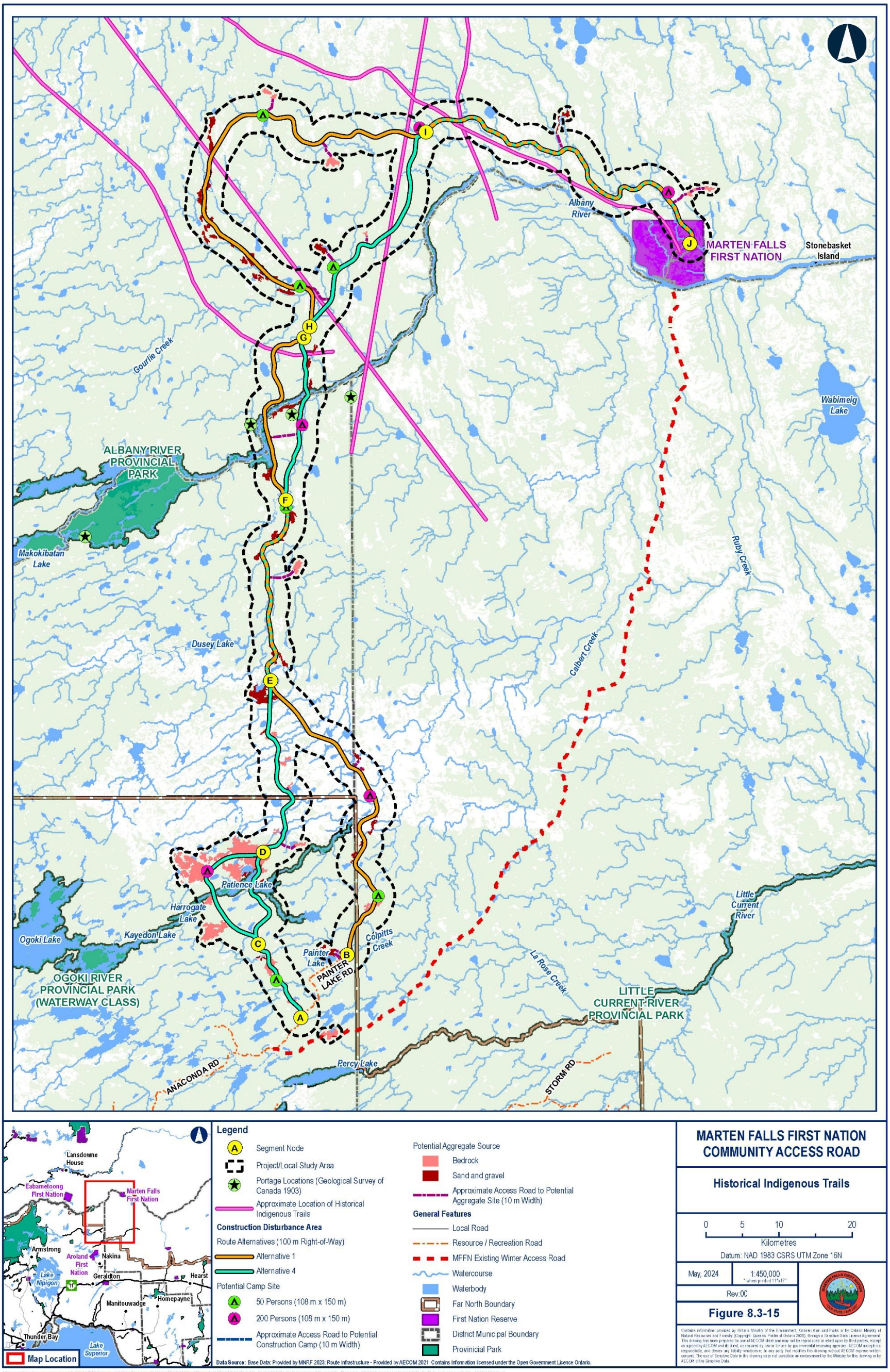


Figure 8.3-15: Historical Indigenous Trails



8.3.7 Atmospheric Environment

8.3.7.1 Air Quality

This section provides a description of existing environmental conditions for air quality and greenhouse gases. The existing air and greenhouse gas conditions are described within the Construction Disturbance Area, Local Study Area, and Regional Study Area.

Data for the air quality and greenhouse gas existing conditions assessment was collected between May 2021 to May 2022. Various sources and Indigenous Knowledge were reviewed as part of this assessment. Air quality monitoring equipment was set up in Marten Falls to measure various pollutants like particulate matter ($PM_{2.5}$), ozone, nitrogen oxides, sulphur dioxide, and some chemicals (benzene, toluene, ethylbenzene, and xylene). It also measured weather conditions like wind speed, wind direction, temperature, humidity, air pressure, and rainfall.

The complete description of the air quality and greenhouse gas existing conditions is documented in the Atmospheric Environment Technical Support Document (**Appendix S**).

8.3.7.1.1 Existing Meteorology

Meteorological parameters (wind speed, wind direction, temperature, relative humidity, barometric pressure, and rain precipitation) were measured through the ambient air quality monitoring program (May 2021 to May 2022). **Table 8.3-12** provides a summary of hourly meteorological parameters collected for an annual average.

Table 8.3-12: Meteorological Parameter Summary

Hourly Data Parameter	Max	Min	Annual Average	Annual Total
Wind Speed (metres per second)	6.3	0.03	1.72	-
Temperature (degrees Celsius)	36	-39	0.3	-
Relative Humidity (percent)	100	13	71	-
Barometric Pressure (millimetres of mercury)	765	718	746	-
Rain Precipitation (millimetres)	17	0	0.06	565

The annual average wind speed at Marten Falls is low, at 1.72 metres per second. Most winds come from the west and are generally low in speed. The area has short warm summers and long cold winters, with temperatures ranging from 36 degrees Celsius in summer to minus 39 degrees Celsius in winter. The average humidity is high at 71 percent, staying above 70 percent in winter. Rainfall is higher in summer than in winter.

8.3.7.1.2 Existing Air Quality

The existing air quality conditions were assessed using data from air monitoring and desktop studies. The results, shown in **Table 8.3-13**, were calculated using methods from the Ambient Air Quality Criteria (Ministry of the Environment, Conservation and Parks, 2020) and the Canadian Ambient Air Quality Standards (Canadian Council of Ministers of the Environment, no date). The data came from 1 year of monitoring, either continuously or at intervals, depending on the pollutant.

For pollutants with 1-hour and 24-hour criteria, the maximum and 90th percentile of background concentrations will be compared against the applicable standards and criteria. The 90th percentile helps show typical background levels, excluding unusual events like forest fires. For pollutants with annual criteria, the average concentrations over the year were summarized. Ambient air quality results can be found in **Table 8.3-13**.

Both the Ontario Ambient Air Quality Criteria and the Canadian Ambient Air Quality Standards set guidelines for air quality. The Canadian standards are more stringent and aim for regional air quality goals, not specific project targets.

Most contaminants were below both of these standards and criteria when comparing their maximum and 90th percentile concentrations, except for particulates and benzo(a)pyrene.

8.3.7.1.2.1 Particulates

The highest 1-hour and 24-hour levels of particulates (Total Suspended Particulate, particulate matter smaller than 10 micrometres in diameter, and particulate matter smaller than 2.5 micrometres in diameter) were above the standards, but the 90th percentile values were below. This means the high levels were occasional. These spikes could be due to events like forest fires or community wood burning. The yearly average levels of particulates were below the standards. The particulates measured could partly come from a nearby unpaved road and the Marten Falls diesel generating station.

It should be noted that the ambient annual total suspended particulates was observed to be 94 percent of its relevant criteria. This is due to the potentially anomalous values that have not been removed from the calculation of annual averaged concentrations. For additional context, the 90th percentile Total Suspended Particulate concentration was shown to be 10 percent of the maximum observed 24-hour Total Suspended Particulate concentration. Therefore, the calculation of annual particulates is anticipated to be conservative.

Table 8.3-13: Ambient Air Quality Results

Contaminant	Chemical Abstracts Service Registry Number	Averaging Period	Criteria (microgram per cubic metre)	Maximum Monitored or Estimated (microgram per cubic metre)	90th Percentile Monitored or Estimated (microgram per cubic metre)	Percent of Guideline for the Maximum	Percent of Guideline for the 90th Percentile	Guideline
Nitrogen Dioxide	10102-44-0	1-hour	400	20.7	3.8	5.2	1.0	Ontario Ambient Air Quality Criteria
Nitrogen Oxide	10102-44-0	1-hour	**79**	16.2	3.8	20.5	4.8	Canadian Ambient Air Quality Standards
Nitrogen Oxide	10102-44-0	24-hour	200	8.1	3.1	4.1	1.6	Ontario Ambient Air Quality Criteria
Nitrogen Oxide	10102-44-0	Annual	**23**	1.3	-	5.8	-	Canadian Ambient Air Quality Standards
Particulate Matter Smaller than 2.5 Micrometres in Diameter	-	24-hour	27	32.0	8.0	118.4	29.7	Ontario Ambient Air Quality Criteria
Particulate Matter Smaller than 2.5 Micrometres in Diameter	-	Annual	9	5.1	-	58	-	Canadian Ambient Air Quality Standards
Particulate Matter Smaller than 2.5 Micrometres in Diameter	-	Annual	9	5.1	-	58	-	Ontario Ambient Air Quality Criteria
Particulate Matter Smaller than 10 Micrometres in Diameter	-	24-hour	50	130.3	31.2	260.6	62.4	Ontario Ambient Air Quality Criteria
Total Suspended Particulate	-	24-hour	120	840.3	89.1	700.3	74.3	Ontario Ambient Air Quality Criteria
Total Suspended Particulate	-	Annual	60	56.6	-	94.4	-	Ontario Ambient Air Quality Criteria
Sulphur Dioxide	7446-09-5	10-minute	**178**	21.6	4.29	12.1	2.4	Ontario Ambient Air Quality Criteria
Sulphur Dioxide	7446-09-5	1-hour	100	13.1	2.6	13.1	2.6	Ontario Ambient Air Quality Criteria
Sulphur Dioxide	7446-09-5	1-hour	**170**	7.9	2.6	4.6	1.5	Canadian Ambient Air Quality Standards
Sulphur Dioxide	7446-09-5	Annual	10	1.3	-	13	-	Ontario Ambient Air Quality Criteria
Sulphur Dioxide	7446-09-5	Annual	**10**	1.3	-	13	-	Canadian Ambient Air Quality Standards
Carbon Monoxide	630-08-0	1-hour	36,200	4,812	470	13.3	1.3	Ontario Ambient Air Quality Criteria
Carbon Monoxide	630-08-0	8-hour	15,700	2,255	454	14.4	2.9	Ontario Ambient Air Quality Criteria
Acrolein	107-02-8	1-hour	4.5	9.1	0.1	202.8	2.2	Ontario Ambient Air Quality Criteria
Acrolein	107-02-8	24-hour	0.4	3.7	0.04	912.5	10	Ontario Ambient Air Quality Criteria
Acetaldehyde	75-07-0	0.5-hour	500	49.3	13.04	9.9	2.6	Ontario Ambient Air Quality Criteria
Acetaldehyde	75-07-0	24-hour	500	10.3	3.4	2.1	0.7	Ontario Ambient Air Quality Criteria
Benzene	71-43-2	24-hour	2.3	1.1	0.5	47.8	21.7	Ontario Ambient Air Quality Criteria
Benzene	71-43-2	Annual	0.45	0.3	-	66.7	-	Ontario Ambient Air Quality Criteria
Formaldehyde	50-00-0	24-hour	65	31.9	10.7	49.1	16.4	Ontario Ambient Air Quality Criteria
1,3 Butadiene	106-99-0	24-hour	10	2.5	0.8	25	8.0	Ontario Ambient Air Quality Criteria
1,3 Butadiene	106-99-0	Annual	2	0.9	-	45	-	Ontario Ambient Air Quality Criteria
Toluene	108-88-3	24-hour	2,000	1.3	0.5	0.1	0.03	Ontario Ambient Air Quality Criteria
Ethylbenzene	100-41-4	10-minute	1900	2.5	0.32	0.1	0.02	Ontario Ambient Air Quality Criteria
Ethylbenzene	100-41-4	24-hour	1,000	0.7	0.2	0.1	0.02	Ontario Ambient Air Quality Criteria
Xylene	1330-20-7	24-hour	730	2.5	0.7	0.3	0.1	Ontario Ambient Air Quality Criteria
Benzo(a)pyrene	50-32-8	24-hour	0.0001	0.0001	0.0000333	230	66.6	Ontario Ambient Air Quality Criteria
Benzo(a)pyrene	50-32-8	Annual	0.00001	0.00002	-	177.1	-	Ontario Ambient Air Quality Criteria

Footnotes:
- NO_2 Canadian Ambient Air Quality Standards 1-hour averaging based on a 3-year average of the annual 98th percentile of the daily maximum 1-hour average concentrations.
- Particulate matter smaller than 2.5 micrometres in diameter Canadian Ambient Air Quality Standards 24-hour averaging based on the 24-hour 98th percentile ambient measurement annually, averaged over 3 consecutive years.
- Particulate matter smaller than 2.5 micrometres in diameter Canadian Ambient Air Quality Standards annual averaging based on a 3-year average of the annual 98th percentile of the daily 24-hour average concentrations.
- SO_2 Canadian Ambient Air Quality Standards 1-hour averaging based on a 3-year average of the annual 99th percentile of the SO_2 daily maximum 1-hour average concentrations.
- CO values based on the maximum 90th percentile of data obtained from the following Environment Canada National Air Pollution Surveillance stations (Hope Airport, Fort Smith, Inuvik).
- Acrolein, Acetaldehyde, Formaldehyde and 1,3 Butadiene values are based on an Ethylbenzene ratio of United States Environmental Protection Agency Speciate Emission Profiles.
- BAP is estimated based on an averaged ratio of measured B(a)P to particulate matter smaller than 10 micrometres in diameter at representative National Air Pollution Surveillance stations.
- 1,3 Butadiene annual value is based on a ratio of Benzene from the United States Environmental Protection Agency Speciate Emission Profile.
- Bold values indicate that guideline values were reported in parts per billion / parts per million values were converted to micrograms per cubic metre for comparison purposes.

8.3.7.1.2.2 Benzo(a)Pyrene

Benzo(a)pyrene concentrations were estimated from the Environment and Climate Change Canada Simcoe Ontario National Air Pollution Surveillance Program monitoring station, based on measurements from 2017 to 2019. Although this station is located within a rural location, the population within 50 kilometres of Simcoe is over 150,000. The main industries in that region are agriculture and manufacturing and combustion processes in these industries emit benzo(a)pyrene. The use of Simcoe data to reflect benzo(a)pyrene in Community Access Road area substantially over-estimates background air quality.

Benzo(a)Pyrene is a by-product of incomplete combustion of burning organic matter such as wood. The maximum 24-hour concentration of benzo(a)pyrene exceeded the criteria while the 90th percentile is well below the criteria. The annual benzo(a)pyrene is above the Ontario Ambient Air Quality Criteria.

8.3.7.1.2.3 Acrolein

The maximum ambient 1-hour and 24-hour concentrations of acrolein are shown to exceed criteria, while the 90th percentiles are below their respective criteria. It should be noted that acrolein was not a measured indicator compound within the sampling program. Acrolein baseline concentrations were estimated from measured ethylbenzene concentrations. The methodology considered conservative and may overestimate actual acrolein ambient levels as the ethylbenzene ratios resulted in the highest calculated existing concentrations of each volatile organic compound.

8.3.7.2 Greenhouse Gases

No field survey was required for the greenhouse gases study as other discipline field studies such as vegetation and peatlands inform greenhouse gas emissions and ambient air quality studies.

8.3.7.2.1 Existing Greenhouse Gas from Winter Road Travel

8.3.7.2.1.1 Traffic Volume

Traffic on the winter road is generally low, with about eight vehicles (passenger cars and commercial trucks) travelling daily. Around 30 commercial truck trips occur each winter. Road maintenance traffic is minimal, so an extra 1 percent was added to account for it. This results in an estimated average daily traffic of 9.5 vehicles, including all types of vehicles.

8.3.7.2.1.2 Vehicle Type Distribution

Greenhouse Gas emissions from vehicles depend on factors like vehicle type, fuel type, and travel speed. For instance, diesel trucks emit more greenhouse gases than gasoline cars. To estimate emissions for winter roads, a mix of vehicle types (passenger cars and commercial trucks) is needed. Winter roads are mainly used by commercial trucks for delivering goods.

Since there is no traffic survey data for the current winter road, data from a 2017 Greenhouse Gas Assessment Study for Manitoba Infrastructure was used. This study looked at emissions from an all-season road project on the east side of Lake Winnipeg.

8.3.7.2.1.3 Vehicle Emission Factors

The Motor Vehicle Emissions Simulator model predicts vehicle emissions by considering factors like local weather, fuel type, vehicle technology, speed, and road type (United States Environmental Protection Agency, 2020). For this study, January weather data from Ogoki Post Airport was used to mimic existing winter road conditions.

Typical vehicles on winter roads include passenger cars, light-duty trucks, and heavy-duty trucks. These vehicles travel slower on winter roads for safety, affecting their emissions compared to highway speeds. Recommended speeds are 35 kilometres per hour on land roads and 15 kilometres per hour on ice crossings. For estimating greenhouse gases, all vehicles are assumed to travel at an average speed of 35 kilometres per hour.

Major inputs for the Motor Vehicle Emissions Simulator model are provided in **Table 8.3-14** and the output emission factors are summarized in **Table 8.3-15**.

Table 8.3-14: Motor Vehicle Emissions Simulator Model Inputs

Key Motor Vehicle Emissions Simulator Parameters	Motor Vehicle Emissions Simulator Emission Rate Run for Winter Road Traffic
Time Span	• 2023 existing year
Selected representative County	• Niagara County, New York
Vehicle Miles Travelled Fraction	• County default
Age Distribution of Vehicles	• County default
Meteorology	• Marten Falls First Nation Ogoki Post Airport station (ID 6075786) • 2021 Meteorology - January: Average Temperature 9.3 degrees Fahrenheit, humidity 96 percent
Vehicle Types	• Passenger Vehicles • Light-Duty Commercial Trucks • Heavy-Duty Long-Haul Trucks
Road Types	• Rural Unrestricted Access (Road type 3)
Pollutants	• Greenhouse Gases (carbon dioxide equivalent) including carbon dioxide, methane, and nitrous oxide.
Average Speed	• 35 kilometres per hour (Bin 5)
Fuel	• County default fuel formulation • Passenger car uses gasoline • All trucks use diesel

Table 8.3-15: Motor Vehicle Emissions Simulator Emission Factors

Vehicle Types	Emission Factors (grams per vehicle kilometre travelled) Methane (Footnote a)	Emission Factors (grams per vehicle kilometre travelled) Nitrous Oxide (Footnote a)	Emission Factors (grams per vehicle kilometre travelled) Carbon Dioxide (Footnote a)	Emission Factors (grams per vehicle kilometre travelled) Carbon Dioxide Equivalent (Footnote a)
Passenger Vehicles	0.0082	0.0016	222.8	223.5
Light-Duty Commercial Trucks	0.0128	0.0030	308.0	309.1
Heavy-Duty Transport Trucks	0.0272	0.0062	757.1	759.5

Footnotes: (a) Vehicle running exhaust emission factors from the United States Environmental Protection Agency Motor Vehicle Emissions Simulator model.

8.3.7.2.1.4 Winter Road Emission Summary

Table 8.3-16 summarizes the annual greenhouse gas emissions from the existing winter road traffic. The existing traffic on the winter road is estimated to generate approximately 21.1 tonnes of carbon dioxide equivalent, as a part of the total existing greenhouse gases for the Community Access Road.

Table 8.3-16: Greenhouse Gases from Winter Road Traffic

Parameter	Passenger Car	Light-Duty Commercial Truck	Heavy-Duty Transport and Maintenance Truck	Total
Vehicle type distribution	0.7%	83.3%	16.0%	100%
Distance driven (vehicle kilometre travelled per year)	366	46,271	8,878	55,514
Carbon dioxide equivalent emissions factor (grams per vehicle kilometre travelled)	223.5	309.1	759.5	-
Annual carbon dioxide equivalent (tonne)	0.1	14.3	6.7	21.1

8.3.7.2.2 Existing Greenhouse Gas Sequestration from Land Use

The methods for assessing carbon stocks and greenhouse gas emissions followed specific guidelines. The Community Access Road will impact carbon stocks in living biomass, deadwood, and organic soils due to activities like land clearing and soil excavation.

Initial carbon storage in different land uses (for example, forests, wetlands) was estimated to determine changes and emissions. Forests in the area are old-growth and have low carbon sequestration rates, so their total carbon flux is assumed to be zero.

Wetlands in the area are mostly peatlands, which were analyzed for their carbon sink capacities. Peatlands are carbon sources, emitting carbon during non-growing seasons. The area includes bogs, fens, and swamps, emitting 14 tonnes, 551 tonnes, and 1,080 tonnes of carbon annually, respectively.

Overall, the existing land uses in the area emit about 1,646 tonnes of carbon annually.

8.3.8 Community Well-Being

Community well-being encompasses various interconnected aspects that contribute to the overall quality of life in the Local Study Area. These aspects, including economy, socio-community, culture, and human health and community safety, are interconnected and affect each other and community well-being. The existing conditions for community well-being are described based on a combination of information obtained through desktop assessment, engagement, and consultation.

The economy includes economic activities and opportunities within the community, such as employment, income levels, and local businesses. A strong economy supports the financial stability and growth of the community, providing residents with the means to meet their needs and improve their standard of living.

Socio-community and culture focus on the social and cultural dynamics within the community. This includes access to social services, social and cultural connectivity and preservation, traditional economy, and language.

Socio-community and cultural well-being support a strong sense of identity, pride, and cultural continuity among residents. Human health and community safety involve the social, safety, and environmental health of the community. Access to healthcare, safe living conditions, and emergency services are critical components.

8.3.8.1 Local Study Area

8.3.8.1.1 Sustainable Population Growth

The age and gender distribution as well as on-reserve versus off-reserve populations of Marten Falls First Nation and Aroland First Nation are described below to establish the existing conditions related to the Sustainable Population Growth valued component. This section relies on information collected by Statistics Canada, which may be subject to rounding due to small population sizes, resulting in slight discrepancies. Statistics Canada rounds data to a multiple of 5 or 10. Community feedback also indicates that individuals aged 85 plus in the community may not be accurately represented in the Census.

8.3.8.1.1.1 Marten Falls First Nation

Between 2011 and 2021, the on-reserve population of Marten Falls First Nation increased from 190 to 243 residents, with a slight decline observed between 2016 (252 residents) and 2021. This decline may reflect actual population movement or reduced census participation during the 2021 Census, which occurred during the COVID-19

pandemic and had lower response rates in Indigenous communities. Over the same period, population growth in the District of Kenora (14.6 percent) and Ontario (10.7 percent) exceeded that of Marten Falls First Nation. The community has a relatively young age profile. Children and youth aged 0 to 14 make up approximately 35 percent of the population, adults aged 15 to 64 account for about 56 percent, and older adults aged 65 and over represent roughly 8 percent. Given the small population size, age-specific percentages are sensitive to small numerical changes and should be interpreted with caution (**Table 8.3-17**; Statistics Canada, 2011a, 2016a, 2021a).

Gender distribution is relatively balanced. In 2021, the population included approximately 130 men and 115 women. Available data from 2016 indicates a similar pattern. Minor differences appear in certain age cohorts, but these are influenced by small population size and Statistics Canada rounding practices and do not indicate broader demographic trends.

As of December 2025, Marten Falls First Nation has a total registered population of 908 members. Of these, 354 members (39 percent) live on reserve and 554 members (61 percent) live off reserve. On-reserve residents include slightly more men than women, while off-reserve residents include a slightly higher proportion of women. These differences are minor and reflect common patterns among First Nations related to housing availability, education, employment, and other socio-economic factors. Community engagement indicates that some families relocate when children attend secondary school and that working-age adults may live off reserve to access employment opportunities, contributing to the current on- and off-reserve population distribution.

8.3.8.1.1.2 Aroland First Nation

Statistics Canada reports that Aroland First Nation's in-community population was 361 in 2011, 366 in 2016, and 178 in 2021. This apparent decline is likely influenced by census data limitations rather than actual population change. The 2021 Census occurred during the COVID-19 pandemic and had lower response rates in Indigenous communities (approximately 85 percent compared to 92 percent in 2016). In contrast, Aroland First Nation reported approximately 400 residents in 2022, and the engagement program identified approximately 740 total members, with about 400 living in the community. The census-reported decline is also inconsistent with regional trends, as the population of the District of Thunder Bay remained stable between 2011 and 2021, while Ontario's population increased by 10.7 percent (**Table 8.3-18**; Statistics Canada, 2021c, 2021d, 2021e).

Table 8.3-17: Percent of Population by Age Category and Gender in Marten Falls, District of Kenora and Province of Ontario

Population Group and Characteristic	2011 Total	2011 Men	2011 Women	2016 Total	2016 Men	2016 Women	2021 Total	2021 Men	2021 Women
Marten Falls First Nation Total Population	190	Not applicable	Not applicable	252	140	110	243	130	115
Ages 0 to 14 Percent of Total Population	Not applicable	Not applicable	Not applicable	35	36	36	35	39	35
Ages 15 to 64 Percent of Total Population	Not applicable	Not applicable	Not applicable	59	57	59	56	54	57
Ages 65 and over Percent of Total Population	Not applicable	Not applicable	Not applicable	6	7	5	8	8	9
Median Age of Population	Not applicable	Not applicable	Not applicable	21.2	20.3	21.6	23.4	22.6	24.6
Kenora District Total Population	57,607	28,930	28,680	65,533	32,895	32,640	66,000	33,400	32,600
Ages 0 to 14 Percent of Total Population	21	22	21	22	22	22	21	22	21
Ages 15 to 64 Percent of Total Population	62	63	62	64	64	64	62	63	62
Ages 65 and over Percent of Total Population	16	16	17	14	14	15	16	16	17
Median Age of Population	38.6	38.2	38.9	36.5	35.8	37.1	37.6	36.8	38.4
Ontario Total Population	12,851,821	6,263,140	6,588,685	13,448,494	65,59,390	6,889,105	14,223,942	6,970,855	7,253,085
Ages 0 to 14 Percent of Total Population	17	18	16	16	17	16	16	17	15
Ages 15 to 64 Percent of Total Population	68	69	68	67	67	66	66	66	65
Ages 65 and over Percent of Total Population	15	13	16	17	16	18	19	17	20
Median Age of Population	40.4	39.4	41.3	41.3	40.2	42.4	41.6	40.0	42.8

Source: Statistics Canada, 2011a, 2011b, 2011c, 2016c, 2016b, 2016c, 2021a, 2021b, 2021c.

Table 8.3-18: Percent of Population by Age and Gender in Aroland, Thunder Bay District, and Ontario

Population Group and Characteristic	2011 Total	2011 Men	2011 Women	2016 Total	2016 Men	2016 Women	2021 Total	2021 Men	2021 Women
Aroland First Nation Total Population	115	50	55	366	195	170	178	80	95
Ages 0 to 14 Percent of Total Population	29	26	32	36	31	38	33	31	32
Ages 15 to 64 Percent of Total Population	64	69	65	62	67	56	56	56	58
Ages 65 and over Percent of Total Population	4	5	6	4	5	3	11	13	11
Median Age of Population	28.1	32	70.8	24.3	27.2	21.3	29.8	35.6	25.6
Thunder Bay District Total Population	146,055	71,840	74,220	146,050	72,325	73,725	146,860	73,090	73,775
Ages 0 to 14 Percent of Total Population	15	16	15	15	16	14	15	15	14
Ages 15 to 64 Percent of Total Population	68	69	67	66	66	65	63	64	63
Ages 65 and over Percent of Total Population	17	15	18	19	18	21	22	21	23
Median Age of Population	38.6	38.2	38.9	36.5	35.8	37.1	37.6	36.8	38.4
Ontario Total Population	12,851,821	6,263,140	6,588,685	13,448,494	65,59,390	6,889,105	14,223,942	6,970,855	7,253,085
Ages 0 to 14 Percent of Total Population	17	18	16	16	17	16	16	17	15
Ages 15 to 64 Percent of Total Population	68	69	68	67	67	66	66	66	65
Ages 65 and over Percent of Total Population	15	13	16	17	16	18	19	17	20
Median Age of Population	40.4	39.4	41.3	41.3	40.2	42.4	41.6	40.0	42.8

Source: Statistics Canada, 2011a, 2011b, 2011c, 2016a, 2016b, 2016c, 2021a, 2021b, 2021c.

Based on Statistics Canada data, Aroland First Nation has a relatively young population, with approximately 33 percent aged 0 to 14, 56 percent aged 15 to 64, and 11 percent aged 65 and over. This indicates a youthful community with a moderate working-age population and a smaller proportion of older adults. However, small population size and data challenges mean age-specific statistics should be interpreted cautiously (Statistics Canada, 2021c, 2021d, 2021e).

Gender distribution data from the 2021 Census indicates a relatively balanced population, with approximately 80 men and 95 women among 178 individuals. In 2016, approximately 195 men and 170 women were reported within a total population of 366, noting rounding limitations (Statistics Canada, 2021c, 2021d, 2021e). Minor gender differences in specific age cohorts are not considered indicative of broader trends. Given low response rates, the community's non-reserve settlement status, and inconsistencies with community-reported population figures, census-based age and gender distributions should be interpreted with caution. According to Indigenous Services Canada First Nation Community Profiles, as of December 2025 Aroland First Nation has a total registered population of 770 members, with 42 individuals reported as living on reserve and 728 living off reserve. Although Aroland First Nation gained reserve status in 1985, the community settlement itself is not a reserve, limiting the applicability of standard "on-reserve" classifications. Discrepancies between Statistics Canada and Indigenous Services Canada data further highlight the need for careful interpretation of demographic information. A summary of registered population of Aroland First Nation living on and off reserve is included in **Table 8.3-19**.

Table 8.3-19: Registered Population of Aroland First Nation Living On and Off Reserve by Gender

Aroland First Nation	Men	Women	Total
Registered on Reserve	23	19	42
Registered off Reserve	372	356	728
Total Community Members	395	375	770

Source: (Government of Canada, 2026)

8.3.8.1.2 Labour Market Dynamics

8.3.8.1.2.1 Marten Falls First Nation

Table 8.3-20 shows key labour market indicators, disaggregated by gender. Given the data availability, the figures are approximations and may not sum due to rounding. Also, in some cases Statistics Canada rounds down low values and reports them as zeros, even though the actual values may be above zero.

The working-age population (15 years and older) in 2024 was estimated to be approximately 170 individuals, with slightly over half being men. Approximately 41 percent of this population participated in the labour force, actively seeking employment. This percentage has declined slightly over time. In 2024, an estimated 29 percent of the working-age population was employed, with 16 percent working full time. The unemployment rate, which represents the proportion of the labour force unable to find work, was estimated at 30 percent overall, with a higher rate of 46 percent among women.

Table 8.3-21 highlights the latest (2024) labour market profiles for Marten Falls First Nation, Kenora, and Ontario. Marten Falls First Nation has a lower participation rate and lower employment rate comparted to the Kenora District and the province. The unemployment rate is higher among women.

Table 8.3-22 reveals that the Marten Falls First Nation labour force has declined over the years in sectors such as agriculture, forestry, fishing and hunting, utilities, construction, manufacturing, and administrative / support and waste / remediation services. The labour force has grown in the accommodation and food services sector. Educational services, along with healthcare and social assistance, have remained stable in recent years. The largest sector in 2024 for Marten Falls First Nation was public administration, which accounted for nearly half of the labour force.

Table 8.3-20: Labour Market Indicators for Marten Falls First Nation

Marten Falls First Nation Labour Market Indicators	2011 Total	2011 Men	2011 Women	2016 Total	2016 Men	2016 Women	2021 Total	2021 Men	2021 Women	2024 Total (Footnote a)	2024 Men (Footnote a)	2024 Women (Footnote a)
Population (15 plus)	110	55	55	160	85	75	155	85	80	170	95	85
Labour Force	55	30	25	80	40	40	65	35	35	70	40	40
Participation Rate (percent)	50	55	46	50	47	53	42	41	44	41	42	47
Employment Rate (percent)	46	46	36	41	41	47	29	24	25	29	26	29
Employment Rate - Full Time (percent)	41	36	36	22	24	20	16	12	13	16	13	16
Unemployment Rate (percent)	0	0	0	19	25	0	31	29	43	30	29	46

Footnotes: (a) Estimate based on most recent labour force data.
Source: Statistics Canada, 2026a, 2026b, 2011d, 2016a, 2021a; AECOM Analysis.

Table 8.3-21: Labour Market Indicators for Marten Falls First Nation, Kenora District, and Ontario (2024)

Regional Labour Market Indicators	Marten Falls First Nation (Total) (Footnote a)	Marten Falls First Nation (Men) (Footnote a)	Marten Falls First Nation (Women) (Footnote a)	Kenora District (Total) (Footnote a)	Kenora District (Men)	Kenora District (Women) (Footnote a)	Ontario Total (million)	Ontario Men (million)	Ontario Women (million)
Population (15 plus)	170	95	85	55,345	28,020	27,335	13.4	6.6	6.8
Labour Force	70	40	40	31,765	16,680	15,090	8.8	4.6	4.1
Participation Rate (percent)	41	42	47	57	60	55	65	70	61
Employment Rate (percent)	29	26	29	52	54	51	61	65	57
Employment Rate - Full Time (percent)	16	13	16	35	37	32	50	56	44
Unemployment Rate (percent)	30	29	46	9	9	8	7	7	7

Footnotes: (a) Estimate based on most recent labour force data.
Source: Statistics Canada, 2026a, 2026b, 2011d, 2011e, 2011f, 2016a, 2016b, 2016c, 2021a, 2021b, 2021c; AECOM Analysis.

Table 8.3-22: Labour Force by Industry for Marten Falls First Nation

Marten Falls First Nation Labour Force by Industry	2011 Total	2011 Men	2011 Women	2016 Total	2016 Men	2016 Women	2021 Total	2021 Men	2021 Women	2024 Total (Footnote a)	2024 Men (Footnote a)	2024 Women (Footnote a)
Agriculture, forestry, fishing and hunting	0	0	0	10	0	0	0	0	0	0	0	0
Mining, quarrying, and oil and gas extraction	0	0	0	0	0	0	0	0	0	0	0	0
Utilities	0	0	0	10	0	0	0	0	0	0	0	0
Construction	0	0	0	10	0	0	0	0	0	0	0	0
Manufacturing	0	0	0	10	10	0	0	0	0	0	0	0
Wholesale trade	0	0	0	0	0	0	0	0	0	0	0	0
Retail trade	0	0	0	0	0	0	0	0	0	0	0	0
Transportation and warehousing	0	0	0	0	0	0	0	0	0	0	0	0
Information and cultural industries	0	0	0	0	0	0	0	0	0	0	0	0
Finance and insurance	0	0	0	0	0	0	0	0	0	0	0	0
Real estate and rental and leasing	0	0	0	0	0	0	0	0	0	0	0	0
Professional, scientific and technical services	0	0	0	0	0	0	0	0	0	0	0	0
Management of companies and enterprises	0	0	0	0	0	0	0	0	0	0	0	0
Administrative and support, waste and remediation services	0	0	0	10	0	10	0	0	0	0	0	0
Educational services	0	0	0	10	0	0	10	10	10	10	10	10
Health care and social assistance	0	0	0	10	10	10	10	0	10	10	0	10
Arts, entertainment and recreation	0	0	0	0	0	0	0	0	0	0	0	0
Accommodation and food services	0	0	0	0	0	0	10	0	10	10	0	10
Other services (except public administration)	0	0	0	0	0	0	0	0	0	0	0	0
Public administration	35	20	15	25	10	10	30	15	10	30	15	10
Unclassified / Adjustment	20	10	10	-15	10	10	5	10	-5	10	15	0

Footnotes: (a) Estimate based on most recent labour force data.
Source: Statistics Canada, 2026a, 2026b, 2011d, 2016d, 2021a; AECOM Analysis.

The addition of the Community Access Road is expected to boost the local economy by creating new labour force opportunities across various industries. The vacant positions in **Table 8.3-23** highlight the potential impact of investment in the region. Note that some figures are rounded, so individual numbers may appear as less than 5, but their sum may be greater than 5. There is availability in the regional labour force across industries to fill potential economic opportunities created by the project.

Using the available Census / National Household Survey earnings data, along with the most recent employment data, estimated figures for Marten Falls First Nation are presented in **Table 8.3-24**. To better understand income, it is useful to focus on after-tax income, which represents the amount remaining after taxes, available for spending or saving. Note that employment income is exempt from income tax under paragraph 81(1)(a) of the *Income Tax Act* and section 87 of the *Indian Act* only if the income is situated on a reserve.

The above earnings table for Marten Falls First Nation shows that the average after-tax income in 2024 was higher for women ($34,500) than for men ($26,000). After-tax income includes government transfers, which for Marten Falls First Nation have been roughly three times higher for women on average relative to men. The average after-tax income for men grew 40 percent since 2011, or 2.6 percent per year, while for women it grew 52 percent, or 3.3 percent annually. The total figure was around $29,900. This represents a 45 percent increase from its 2011 level of $20,600, which translates to a 2.9 percent annual average increase (same as Ontario) This is a low increase in purchasing power, given that Ontario’s average inflation rate was 2.4 percent during this period.

Educational attainment refers to the highest level of education that individuals have completed. It is a key indicator of socio-economic development, employment opportunities, and community well-being.

As seen in **Table 8.3-25**, in 2021, the percentage of individuals in Marten Falls First Nation without a certificate, diploma, or degree remained high compared to broader regions, with 50.0 percent of men and 68.8 percent of women in this category. This represents an improvement from 2016, where 88.2 percent of men and 56.3 percent of women lacked formal educational credentials. However, these figures remain significantly higher than those for Kenora Census District (32.5 percent of men, 29.3 percent of women) and Ontario (15.8 percent of men, 14.8 percent of women) (Statistics Canada, 2011, 2016, 2021).

Table 8.3-23: Labour Force by Industry for Marten Falls First Nation, Kenora District, and Ontario (2024)

Regional Labour Force by Industry	Marten Falls First Nation (Total) (Footnote a)	Marten Falls First Nation (Men) (Footnote a)	Marten Falls First Nation (Women) (Footnote a)	Kenora District (Total) (Footnote a)	Kenora District (Men) (Footnote a)	Kenora District (Women) (Footnote a)	Ontario Total (thousands)	Ontario Men (thousands)	Ontario Women (thousands)
Agriculture, forestry, fishing and hunting	0	0	0	785	590	200	125	80	45
Mining, quarrying, and oil and gas extraction	0	0	0	1,060	890	175	40	35	5
Utilities	0	0	0	440	415	25	65	50	15
Construction	0	0	0	2,555	2,290	270	635	565	85
Manufacturing	0	0	0	1,075	875	195	775	550	230
Wholesale trade	0	0	0	300	250	55	290	190	100
Retail trade	0	0	0	3,465	1,820	1,645	945	465	480
Transportation and warehousing	0	0	0	1,615	1,275	345	450	340	115
Information and cultural industries	0	0	0	230	145	80	200	120	80
Finance and insurance	0	0	0	460	120	350	470	225	250
Real estate and rental and leasing	0	0	0	375	240	135	180	95	85
Professional, scientific and technical services	0	0	0	830	400	440	805	465	345
Management of companies and enterprises	0	0	0	10	0	0	30	15	15
Administrative and support, waste and remediation services	0	0	0	865	510	350	385	220	165
Educational services	10	10	10	3,305	995	2,300	630	200	425
Health care and social assistance	10	0	10	6,625	1,640	4,965	1,015	195	805
Arts, entertainment and recreation	0	0	0	315	205	115	155	80	75
Accommodation and food services	10	0	10	1,630	745	885	460	205	255
Other services (except public administration)	0	0	0	1,060	565	490	335	160	175
Public administration	30	15	10	4,010	2,230	1,775	505	260	250
Unclassified / Adjustment	10	15	0	755	480	295	259.7	122.4	117.3

Footnotes: Estimate based on most recent labour force data.
Source: Statistics Canada, 2026a, 2026b, 2011b, 2011e, 2011f, 2016a, 2016b, 2016c, 2021a, 2021b, 2021c; AECOM Analysis.

Table 8.3-24: After-tax Income for Marten Falls First Nation

Earnings	2011 Total	2011 Men	2011 Women	2016 Total	2016 Men	2016 Women	2021 Total	2021 Men	2021 Women	2024 Total (Footnote a)	2024 Men (Footnote a)	2024 Women (Footnote a)
Average after-tax income (thousands of dollars)	20.6	18.6	22.7	22.9	20.6	25.5	27.0	23.6	31.2	29.9	26.0	34.5
Median after-tax income (thousands of dollars)	13.7	12.3	18	14.9	13.1	20	18.1	15.1	25.6	20.1	16.7	28.3
Average-to-median after-tax income ratio	1.5	1.5	1.3	1.5	1.6	1.3	1.5	1.6	1.2	1.5	1.6	1.2

Footnotes: (a) Estimate based on most recent labour force data.
Source: Statistics Canada, 2026c, 2011d, 2016a, 2021a; AECOM Analysis.

Table 8.3-25: Highest Attained Education for the Population Aged 15 and Older in Marten Falls First Nation, Kenora, and Ontario

Highest Attained Certificate, Diploma, or Degree for the Population Aged 15 Years and Over (percent)	Year	Marten Falls First Nation Men	Marten Falls First Nation Women	Kenora Census District Men	Kenora Census District Women	Ontario Men	Ontario Women
No certificate, diploma or degree	2011 (Footnote a)	100	81.8	33.3	29.2	18.9	18.4
No certificate, diploma or degree	2016	88.2	56.3	36.8	33.7	18.0	17.1
No certificate, diploma or degree	2021	50.0	68.8	32.5	29.3	15.8	14.8
High (secondary) school diploma or equivalency certificate	2011 (Footnote a)	0	0	23.7	26.1	26.4	27.1
High (secondary) school diploma or equivalency certificate	2016	11.8	18.8	24.0	24.6	27.8	27.1
High (secondary) school diploma or equivalency certificate	2021	27.8	18.8	29.6	28.4	28.0	26.4
Apprenticeship or trades certificate or diploma	2011 (Footnote a)	0	18.2	16.8	5.4	10.3	4.6
Apprenticeship or trades certificate or diploma	2016	0	0	13.9	3.7	8.8	3.4
Apprenticeship or trades certificate or diploma	2021	11.1	0	11.7	3.3	7.4	2.7
College, CEGEP (footnote b) or other non-university certificate or diploma	2011 (Footnote a)	0	0	14.7	22.7	17.7	21.8
College, CEGEP (footnote b) or other non-university certificate or diploma	2016	0	0	15.2	22.4	18.4	23.1
College, CEGEP (footnote b) or other non-university certificate or diploma	2021	11.1	12.5	15.3	21.9	18.3	22.2
University certificate or diploma below bachelor level	2011 (Footnote a)	0	0	2.4	3.4	3.8	4.3
University certificate or diploma below bachelor level	2016	0	12.5	1.5	2.5	2.0	2.4
University certificate or diploma below bachelor level	2021	0	0	1.2	1.9	2.1	2.5
Bachelor's degree or higher	2011 (Footnote a)	0	0	9.2	13.2	23.0	23.8
Bachelor's degree or higher	2016	0	12.5	8.6	13.2	25.0	27.0
Bachelor's degree or higher	2021	0	0	9.7	15.2	28.4	31.4

Footnotes: (a) The 2011 National Household Survey did not provide information on percentages. The information displayed here has been calculated based on the counts provided by the 2011 National Household Survey.
(b) Collège d'enseignement général et professionnel – an intermediate level of education in Quebec, between high school and university.
Source: Statistics Canada, 2026a, 2026b, 2011d, 2011e, 2011f, 2016a, 2016b, 2016c, 2021a, 2021b, 2021c.

In terms of secondary education, Marten Falls First Nation has shown steady increase but remains lower than provincial averages. In 2021, 27.8 percent of men and 18.8 percent of women in Marten Falls First Nation had a high school diploma. Postsecondary education attainment in Marten Falls First Nation is still notably lower than in larger regions, with only a small percentage of residents holding college or university credentials. For instance, in 2021, 11.1 percent of men and 12.5 percent of women in Marten Falls First Nation had a college diploma, compared to 15.3 percent of men and 21.9 percent of women in Kenora Census District and 18.3 percent of men and 22.2 percent of women in Ontario. Individuals in Marten Falls First Nation who pursued postsecondary education were engaged in a variety of fields, although the focus was primarily in business management, architecture, and engineering (**Table 8.3-26**). By 2021, business management had become the dominant field of study, with 120 individuals (55 men and 65 women) listing it as their area of focus (Statistics Canada 2016, 2021). This represents a growing interest in business, public administration, and management roles within the community.

Table 8.3-26: Major Field of Study in Marten Falls First Nation

Marten Falls First Nation Major Field of Study	2016 Total (Population)	2016 Men	2016 Women	2021 Total (Population)	2021 Men	2021 Women
No postsecondary certificate, diploma or degree	140	75	60	105	45	60
Architecture, engineering, and related trades	10	0	0	10	0	0
Education	0	0	10	0	0	0
Business, management and public administration	10	0	10	120	55	65
Architecture, engineering, and related technologies	10	0	0	0	0	00
Personal, protective and transportation services	10	10	0	0	0	0

Source: Statistics Canada, 2016a, 2016b, 2016c, 2021a, 2021b, 2021c.

8.3.8.1.2.2 Aroland First Nation

Table 8.3-27 shows key labour market indicators for Aroland First Nation. In 2024, the working-age population (15 years and older) of Aroland First Nation was estimated at approximately 130 individuals, with over half being women. This represents a decline from 240 individuals in 2016. Labour force participation in 2024 was 38 percent, down from 58 percent in 2011. About 35 percent of the working-age population was employed in 2024, with around 30 percent working full time. The unemployment rate in 2024 was near 0 percent, a significant decrease from 40 percent in 2011, which had been largely driven by a 55 percent unemployment rate among women. While the low participation rate indicates that a relatively small share of the population was seeking work, the low unemployment rate signifies that many seeking work were able to find employment, resulting in a near 0 percent unemployment rate.

Table 8.3-28 compares the latest (2024) labour market profiles for Aroland First Nation, Thunder Bay District, and Ontario. With the unemployment rate at near 0 percent, it should be noted that Aroland First Nation has a much lower participation rate and a much lower employment rate than its district and province.

Table 8.3-29 shows that Aroland First Nation's shrinking labour force has persisted in industries such as agriculture, forestry, fishing and hunting, educational services, health care and social assistance, and public administration. While public administration was the dominant sector in 2011, it has since driven the labour force decline alongside a reduction in economic activity.

Table 8.3-30 is a comparison of the latest (2024) labour force for Aroland First Nation, Thunder Bay District, and Ontario.

Table 8.3-27: Labour Market Indicators for Aroland First Nation

Aroland First Nation Labour Market Indicators	2011 Total	2011 Men	2011 Women	2016 Total	2016 Men	2016 Women	2021 Total	2021 Men	2021 Women	2024 Total (Footnote a)	2024 Men (Footnote a)	2024 Women (Footnote a)
Population (15 plus)	215	115	100	240	135	100	120	55	70	130	60	75
Labour Force	125	70	55	125	75	55	45	20	25	50	20	25
Participation Rate (percent)	58	61	55	52	56	55	38	36	36	38	33	33
Employment Rate (percent)	35	39	25	42	41	45	33	36	29	35	33	27
Employment Rate - Full Time (percent)	35	39	30	27	26	30	29	27	23	30	25	22
Unemployment Rate (percent)	40	29	55	20	20	18	0	0	0	0	0	0

Footnotes: (a) Estimate based on most recent labour force data.
Source: Statistics Canada, 2026a, 2026b, 2011g, 2016d, 2021d; AECOM Analysis.

Table 8.3-28: Labour Market Indicators for Aroland First Nation, Thunder Bay District, and Ontario (2024)

Regional Labour Market Indicators	Aroland First Nation (Total) (Footnote a)	Aroland First Nation (Men) (Footnote a)	Aroland First Nation (Women) (Footnote a)	Thunder Bay District (Total) (Footnote a)	Thunder Bay District (Men) (Footnote a)	Thunder Bay District (Women) (Footnote a)	Ontario Total	Ontario Men	Ontario Women
Population (15 plus)	130	60	75	133,225	66,360	66,865	13.4 million	6.6 million	6.8 million
Labour Force	50	20	25	77,045	39,960	37,075	8.8 million	4.6 million	4.1 million
Participation Rate (percent)	38	33	33	58	60	55	65	70	61
Employment Rate (percent)	35	33	27	52	54	49	61	65	57
Employment Rate - Full Time (percent)	30	25	22	30	33	27	50	56	44
Unemployment Rate (percent)	0	0	0	11	11	11	7	7	7

Footnotes: (a) Estimate based on most recent labour force data.
Source: Statistics Canada, 2026a, 2026b, 2011f, 2011g, 2011h, 2016c, 2016d, 2016h, 2021c, 2021d, 2021e; AECOM Analysis.

Table 8.3-29: Labour Force by Industry for Aroland First Nation

Aroland First Nation Labour Force by Industry	2011 Total	2011 Men	2011 Women	2016 Total	2016 Men	2016 Women	2021 Total	2021 Men	2021 Women	2024 Total (Footnote a)	2024 Men (Footnote a)	2024 Women (Footnote a)
Agriculture, forestry, fishing and hunting	10	10	0	15	15	0	10	10	0	10	10	0
Mining, quarrying, and oil and gas extraction	0	0	0	0	0	0	0	0	0	0	0	0
Utilities	0	0	0	0	10	0	0	0	0	0	0	0
Construction	0	0	0	0	10	0	10	0	10	10	0	10
Manufacturing	0	0	0	0	0	0	0	10	0	0	10	0
Wholesale trade	0	0	0	0	0	0	0	0	0	0	0	0
Retail trade	0	0	0	10	0	0	0	0	0	0	0	0
Transportation and warehousing	0	0	0	0	0	0	0	0	0	0	0	0
Information and cultural industries	0	0	0	0	0	0	0	0	0	0	0	0
Finance and insurance	0	0	0	0	0	0	0	0	0	0	0	0
Real estate and rental and leasing	0	0	0	0	0	0	0	0	0	0	0	0
Professional, scientific and technical services	0	0	0	0	0	0	0	0	0	0	0	0
Management of companies and enterprises	0	0	0	0	0	0	0	0	0	0	0	0
Administrative and support, waste and remediation services	10	0	0	10	0	0	0	0	0	0	0	0
Educational services	0	0	0	25	10	15	15	0	10	15	0	10
Health care and social assistance	15	0	15	25	0	20	10	0	0	10	0	0
Arts, entertainment and recreation	0	0	0	10	0	0	0	0	0	0	0	0
Accommodation and food services	0	0	0	10	0	0	0	0	0	0	0	0
Other services (except public administration)	0	0	0	0	0	0	0	0	0	0	0	0
Public administration	60	40	15	30	20	10	10	10	0	10	10	0
Unclassified / Adjustment	30	20	25	-10	10	10	-10	-10	5	-5	-10	5

Footnotes: (a) Estimate based on most recent labour force data.
Source: Statistics Canada, 2026a, 2026b, 2011g, 2016d, 2021d; AECOM Analysis.

Table 8.3-30: Labour Force by Industry for Aroland First Nation, Thunder Bay District, and Ontario (2024)

Regional Labour Force by Industry	Aroland First Nation (Total) (Footnote a)	Aroland First Nation (Men) (Footnote a)	Aroland First Nation (Women) (Footnote a)	Thunder Bay District (Total) (Footnote a)	Thunder Bay District (Men) (Footnote a)	Thunder Bay District (Women) (Footnote a)	OntarioTotal (thousands) (Footnote a)	Ontario Men (thousands) (Footnote a)	Ontario Women (thousands) (Footnote a)
Agriculture, forestry, fishing and hunting	10	10	0	1,820	1,280	535	125	80	45
Mining, quarrying, and oil and gas extraction	0	0	0	2,065	1,810	260	40	35	5
Utilities	0	0	0	1,055	850	205	65	50	15
Construction	10	0	10	5,630	5,020	625	635	565	85
Manufacturing	0	10	0	2,980	2,375	610	775	550	230
Wholesale trade	0	0	0	1,520	1,205	325	290	190	100
Retail trade	0	0	0	9,325	4,535	4,785	945	465	480
Transportation and warehousing	0	0	0	4,590	3,665	935	450	340	115
Information and cultural industries	0	0	0	1,115	675	440	200	120	80
Finance and insurance	0	0	0	1,470	540	925	470	225	250
Real estate and rental and leasing	0	0	0	800	500	290	180	95	85
Professional, scientific and technical services	0	0	0	4,040	2,265	1,770	805	465	345
Management of companies and enterprises	0	0	0	45	35	10	30	15	15
Administrative and support, waste and remediation services	0	0	0	2,565	1,700	865	385	220	165
Educational services	15	0	10	6,790	2,225	4,550	630	200	425
Health care and social assistance	10	0	0	14,580	2,885	11,660	1,015	195	805
Arts, entertainment and recreation	0	0	0	1,130	595	540	155.0	80	75
Accommodation and food services	0	0	0	4,890	2,165	2,720	460.0	205	255
Other services (except public administration)	0	0	0	3,230	1,750	1,475	335.0	160	175
Public administration	10	10	0	5,815	2,955	2,855	505.0	260	250
Unclassified / Adjustment	-5	-10	5	1,590	930	695	259.7	122.4	117.3

Footnotes: (a) Estimate based on most recent labour force data.
Source: Statistics Canada, 2026a, 2026b, 2011f, 2011g, 2011h, 2016c, 2016d, 2016h, 2021c, 2021d, 2021e; AECOM Analysis.

The earnings data in **Table 8.3-31** indicate that the average after-tax income in Aroland First Nation in 2024 was $26,600. Women in Aroland First Nation had a higher average after-tax income ($30,800) compared to men ($23,600). After-tax income includes government transfers, which for Aroland First Nation have been roughly two times higher for women on average relative to men. The average after-tax income for men grew 39 percent since 2011, or 2.6 percent per year, while for women it grew 73 percent, or 4.3 percent annually. The 2024 average after-tax income represents a 53 percent increase from the 2011 level of $17,300, equating to a 3.3 percent annual growth. This increase in purchasing power is relatively low compared to Ontario's average inflation rate of 2.4 percent during the same period.

The following comparison in **Table 8.3-32** of the latest (2024) earnings for Aroland First Nation, Thunder Bay District, and Ontario shows that women in Aroland First Nation earn more than men. This is in contrast to the census district and province, where men earn more than women. However, all income levels in Aroland First Nation are lower than those in the Thunder Bay District and Ontario. Income inequality in Aroland First Nation is more pronounced, particularly among men, compared to both the district and province.

In 2021, educational attainment in Aroland First Nation showed mixed trends (**Table 8.3-33**). While the percentage of men without a certificate, diploma, or degree decreased from 50.0 percent in 2016 to 40.0 percent in 2021, the percentage of women without formal credentials increased from 43.5 percent to 61.5 percent. Despite some progress for men, overall educational attainment in the community remains lower than in broader regions (Statistics Canada, 2011, 2016, 2021).

As noted in **Table 8.3-34**, in 2016, individuals in Aroland First Nation who pursued postsecondary education were engaged in a variety of fields, although the focus was primarily in business management, social sciences, and architecture. By 2021, the data no longer recorded a significant number of individuals in business or social sciences, while architecture remained a minor field (Statistics Canada 2016, 2021). This suggests a shift in academic interests or possible challenges in accessing postsecondary programs for certain fields.

Table 8.3-31: Earnings for Aroland First Nation

Aroland First Nation Earnings	2011 Total	2011 Men	2011 Women	2016 Total	2016 Men	2016 Women	2021 Total	2021 Men	2021 Women	2024 Total	2024 Men	2024 Women
Average after-tax income (thousands of dollars)	17.3	17.0	17.8	20.4	18.7	22.8	24.1	21.4	27.9	26.6	23.6	30.8
Median after-tax income (thousands of dollars)	15.9	13.6	16.3	13.9	11.5	20.7	16.9	13.3	26.4	18.7	14.7	29.2
Average-to-median after-tax income ratio	1.1	1.2	1.1	1.5	1.6	1.1	1.4	1.6	1.1	1.4	1.6	1.1

Source: Statistics Canada, 2026a, 2026b, 2011g, 2016d, 2021d; AECOM Analysis.

Table 8.3-32: Earnings for Aroland First Nation, Thunder Bay District, and Ontario (2024)

Regional Earnings	Aroland First Nation (Total) (Footnote a)	Aroland First Nation (Men) (Footnote a)	Aroland First Nation (Women) (Footnote a)	Thunder Bay District (Total) (Footnote a)	Thunder Bay District (Men) (Footnote a)	Thunder Bay District (Women) (Footnote a)	Ontario Total (Footnote a)	Ontario Men (Footnote a)	Ontario Women (Footnote a)
Average after-tax income (thousands of dollars)	26.6	23.6	30.8	48.8	53.9	43.7	51.2	57.4	45.3
Median after-tax income (thousands of dollars)	18.7	14.7	29.2	42.9	47.8	38.9	41.1	45.5	37.6
Average-to-median after-tax income ratio	1.4	1.6	1.1	1.1	1.1	1.1	1.2	1.3	1.2

Footnotes: (a) Estimate based on most recent labour force data.
Source: Statistics Canada, 2026a, 2026b, 2011f, 2011g, 2011h, 2016c, 2016d, 2016e, 2021c, 2021d, 2021e; AECOM Analysis.

Table 8.3-33: Highest Attained Education for the Population Aged 15 and Older in Aroland First Nation, Thunder Bay, and Ontario

Highest Attained Certificate, Diploma, or Degree for the Population Aged 15 Years and Over (percent)	Year	Aroland First Nation Men	Aroland First Nation Women	Thunder Bay District Men	Thunder Bay District Women	Ontario Men	Ontario Women
No certificate, diploma or degree	2011 (Footnote a)	71.4	70.0	22.5	22.9	18.9	18.4
No certificate, diploma or degree	2016	50.0	43.5	21.8	20.7	18.0	17.1
No certificate, diploma or degree	2021	40.0	61.5	18.7	17.2	15.8	14.8
High (secondary) school diploma or equivalency certificate	2011 (Footnote a)	14.3	20.0	24.4	25.7	26.4	27.1
High (secondary) school diploma or equivalency certificate	2016	28.6	21.7	25.2	26.5	27.8	27.1
High (secondary) school diploma or equivalency certificate	2021	33.3	23.1	28.1	27.6	28.0	26.4
Apprenticeship or trades certificate or diploma	2011 (Footnote a)	14.3	0	17.6	5.3	10.3	4.6
Apprenticeship or trades certificate or diploma	2016	10.7	0	14.5	3.4	8.8	3.4
Apprenticeship or trades certificate or diploma	2021	13.3	0	12.5	2.9	7.4	2.7
College, CEGEP (footnote b) or other non-university certificate or diploma	2011 (Footnote a)	0	10.0	18.7	25.9	17.7	21.8
College, CEGEP (footnote b) or other non-university certificate or diploma	2016	10.7	17.4	21.0	27.1	18.4	23.1
College, CEGEP (footnote b) or other non-university certificate or diploma	2021	13.3	15.4	21.1	27.1	18.3	22.2
University certificate or diploma below bachelor level	2011 (Footnote a)	0	0	2.4	2.6	3.8	4.3
University certificate or diploma below bachelor level	2016	0	8.7	1.8	2.1	2.0	2.4
University certificate or diploma below bachelor level	2021	0	0	1.7	2.0	2.1	2.5
Bachelor's degree or higher	2011 (Footnote a)	0	0	14.5	17.6	23.0	23.8
Bachelor's degree or higher	2016	0	8.7	15.7	20.3	25.0	27.0
Bachelor's degree or higher	2021	0	0	17.8	23.2	28.4	31.4

Footnotes: (a) The 2011 National Household Survey did not provide information on percentages. The information displayed here has been calculated based on the counts provided by the 2011 National Household Survey.
(b) Collège d'enseignement général et professionnel – an intermediate level of education in Quebec, between high school and university.
Source: Statistics Canada, 2026a, 2026b, 2011f, 2011g, 2011h, 2016c, 2016d, 2016e, 2021c, 2021d, 2021e.

Table 8.3-34: Major Field of Study in Aroland First Nation

Major Field of Study	2016 Total (Population)	2016 Men	2016 Women	2021 Total (Population)	2021 Men	2021 Women
No postsecondary certificate, diploma or degree	190	105	80	105	45	60
Social and behavioural sciences and law	0	10	10	0	0	0
Education	0	0	10	0	0	0
Business, management and public administration	15	10	10	0	0	0
Architecture, engineering, and related technologies	0	10	0	10	0	0
Personal, protective and transportation services	15	10	0	0	0	0

Source: Statistics Canada, 2016c, 2016d, 2016e, 2021c, 2021d, 2021e.

8.3.8.1.3 Economy

8.3.8.1.3.1 Marten Falls First Nation

Local Businesses and Commercial Activities

Marten Falls First Nation, Aroland First Nation, and Eabametoong First Nation signed a cooperation agreement in March 2015 to work together on forest management and business ventures. This led to the establishment of the Agoke Development Limited Partnership, which was incorporated in September 2015. It is equally owned by all three First Nations and is designed as a vehicle to focus on business and to pursue forest management (Agoke Development Corporation, no date).

Within the community there are a few small private businesses including a convenience store, community grocery store, fuel supply business, and a lodging business. The cost of living in the community is high due to the lack of access with high costs for electricity and goods due to the transportation costs of fuel and goods. The small population size of the community and lack of a road limits private businesses in Marten Falls First Nation. Resource-based tourism operations are also operated by community members.

Marten Falls First Nation has an Economic Development Department with the following responsibilities and initiatives (211 Ontario North, 2024a):

- Provides information, training, and educational workshops to enhance employability skills;
- Responsible for development of plans for the use of traditional lands for community members;
- Works to access funding for band-owned business ventures;
- Provides coaching in areas such as business plan development and assistance in obtaining financial support for people wanting to start their own business;
- Maintains local business directory;
- Provides advisory for local businesses including the grocery store and a fuel supply business;
- Assists in the study of connecting the community by road to the permanent highway system; and
- Develops a comprehensive community profile to determine community assets, labour force inventory and land inventory for new business development as these all relate to opportunities from the Ring of Fire mining venture.

Marten Falls First Nation is also supported by Matawa Economic Development.

> "Matawa Economic Development works with the Matawa First Nations to develop, promote and support a diverse private sector and entrepreneurial culture. It works to create 'opportunity-ready' communities and foster economic growth through economic and business development. It assists Matawa First Nations develop infrastructure, businesses and human capital to grow local economies. It also works with Matawa First Nation community development corporations to build capacity and develop projects and business opportunities to become more self-sufficient" — **Matawa First Nations**

Ministry of Labour, Immigration, Training and Skills Development is providing funding to enable the Marten Falls First Nation and Webequie First Nation to develop a comprehensive workforce development strategy that outlines the diversity of employment readiness and training pathways needed to help prepare community members for potential future employment opportunities. This is intended to develop priority recommendations and build community capacity related to workforce development by leveraging community-based workforce developer trainee positions for Marten Falls First Nation and Webequie First Nation.

8.3.8.1.3.2 Public Finances

The latest financial statement for Marten Falls First Nation was done for the 2018 / 2019 fiscal year. It showed revenues of $25.1 million, led by $9.9 million from the federal government's Indigenous and Northern Affairs Canada and $7.5 million from the provincial government's Ministry of Northern Economic Development and Growth. Expenditures totalled $22.8 million, mostly due to $11.5 million by Public Works and $2.6 million by Educational Programs. The annual balance was a surplus in the amount of $2.2 million. After accounting for $5.4 million of Inter-fund Transfers, the total annual balance was a surplus of $7.6 million. The transfers were from the Capital Funds to the Operating Funds, representing tangible capital assets purchased and capital asset projects that were developed by Marten Falls First Nation during the year from various capital projects. This total surplus added to the accumulated surplus of $20.9 million at the start of the 2018 / 2019 fiscal year to result in the accumulated surplus of $28.5 million at the end of the fiscal year.

8.3.8.1.3.3 Aroland First Nation

Local Businesses and Commercial Activities

Aroland First Nation is engaged in a variety of economic development activities. Currently, small businesses operate within Aroland First Nation including a gas bar,

convenience store, taxi company, and tourist outfitters (Marten Falls First Nation, 2023d). Aroland First Nation engages in a variety of small resource harvesting activities for commercial purposes including harvesting blueberries and small-scale agriculture.

Aroland First Nation also engages in industrial development managed through Aroland Industrial LP which pursues forestry and mining contracts regionally (211 Ontario North, 2024b). Aroland First Nation is part of two forest management partnerships: Agoke Lumber and Nedaakiimenaan Inc. Agoke Lumber is a partnership between Aroland First Nation, Marten Falls First Nation, and Eabametoong First Nation. In 2018, Agoke signed a joint venture with Nakina Lumber to restart a Nakina sawmill which will provide forestry opportunities for all parties involved including a goal of 75 percent Indigenous employment (Working Forest, 2018). Nedaakiimenaan Inc. is a partnership consisting of Aroland First Nation, Constance Lake, Ginoogaming, and Long Lake #58 First Nations with a goal of building capacity in the Forest Management of the Kenogami Forest. Aroland First Nation signed a memorandum of understanding with Noront Development which provided shares and “entails the establishment of an ongoing working and communication protocol and the initiation of a dialogue regarding economic development opportunities” (Mining.com, 2019).

Aroland First Nation does not have a publicly available economic development plan for the community. Aroland First Nation is a signatory with other Matawa First Nations and Ontario to a regional framework agreement outlining how communities will benefit from development of the proposed Ring of Fire.

Aroland First Nation has an Economic Development Department with the following responsibilities and initiatives:

- Provides information, training, and educational workshops to enhance employability skills;
- Responsible for development of plans for the use of traditional lands for community members;
- Works to access funding for band-owned business ventures;
- Provides coaching in areas such as business plan development and assistance in obtaining financial support for people wanting to start their own business;
- Provides advisory for local area businesses such as the gas bar, convenience store, tourist outfitters, and taxi company;
- Develops Aroland Industrial LP, an industry which pursues forestry and mining contracts in the area;

- Harvests blueberries and sells to markets in Thunder Bay, Hearst, Kapuskasing, and other southern communities; and
- Establishes community garden with the possibility of exporting produce to northern communities (211 Ontario North, 2024b).

There are small-scale commercial enterprises such as a gas bar, convenience store, taxi company, and tourism outfitters. O'Sullivan Lake Gas Bar is a self-service gas station, which includes a small convenience store and houses a Canada Post postal station. Shopping and services such as Northern Store, gas bar, restaurant, arena and church are available in Nakina, which is located 15 minutes from the community (NorthWesthealthline, 2024a).

8.3.8.1.3.4 Public Finances

The latest financial statement for Aroland First Nation was done for the 2023 / 2024 fiscal year. Revenues totalled $16.8 million, led by $9.3 million from the federal government's Indigenous Services Canada and $1.6 million from the provincial government's Ministry of Children, Community and Social Services. Expenditures were $13.6 million, mostly due to $4.1 for wages and benefits, and $2.9 million for Contract Services. The total annual balance was a surplus in the amount of $3.2 million. This total surplus added to the accumulated surplus of $19.7 million at the start of the 2023 / 2024 fiscal year to result in the accumulated surplus of $22.8 million at the end of the fiscal year (MNP LLP, 2024).

8.3.8.1.4 Community Access to Infrastructure and Services

8.3.8.1.4.1 Marten Falls First Nation

Methods of Transportation in and out of the Community

Marten Falls First Nation does not have permanent road access and currently relies on seasonal winter roads and air transportation. The community is connected to Nakina by a winter road approximately 135 kilometres in length, with a travel time of about 5 hours (NorthWinds Environmental Services, 2023). The road typically operates for six to 11 weeks between January and March, depending on weather conditions (NorthWinds Environmental Services, 2023; Indigenous Watchdog, 2023; Teach for Canada, 2024). Climate change has contributed to increasingly shorter winter road seasons, with the road open for only 6 weeks in 2023, complicating the delivery of goods and services (Achneepineskum, 2023; NorthWinds Environmental Services, 2023; CBC News, 2023).

Winter roads are essential for transporting bulk supplies that are cost-prohibitive to ship by air, including food, fuel, building materials, and annual diesel supplies (NorthWinds

Environmental Services, 2023). They also support personal travel for shopping, recreation, and visiting family. Community members prefer travelling at night when colder temperatures improve ice stability (Three Roads Forum, 2025, personal communication). Reduced winter road access significantly increases costs, as air transport can double supply expenses (CBC News, 2023). Funding for winter road construction and maintenance has not kept pace with inflation and rising fuel and equipment costs (NorthWinds Environmental Services, 2023).

Air access is provided through Marten Falls Airport, a gravel airstrip supporting scheduled passenger and cargo services. Regular flights operate between Marten Falls and Thunder Bay and Nakina, with additional charter flights providing essential year-round connectivity (Kiikenomaga Kikenjigewen Employment and Training, 2017; North Star Air, 2025; Teach for Canada, 2024).

Essential Infrastructure and Services

Water and Wastewater

Marten Falls First Nation has been under a long-term boil water advisory since 2005 (Government of Canada, 2025b). A new water treatment system was constructed and commissioned in 2019 and is capable of producing clean water. However, issues with the raw water intake remain, and a project to address these is underway, with completion anticipated in spring 2025 (Government of Canada, 2025b).

The wastewater treatment facility is aging and requires urgent upgrades. A study completed in 2023 identified critical infrastructure needs. In December 2024, the community declared a state of emergency after raw sewage discharged into a creek flowing into the Albany River, an incident attributed to prolonged underinvestment (Cision, 2021; Achneepineskum, 2024; McGee, 2023). This event raised concerns about potential contamination risks to the water treatment plant intake.

Waste Management Services

The Marten Falls First Nation solid waste disposal site is located approximately 3.5 kilometres north of the community. The community does not provide waste collection services (Marten Falls First Nation, 2023e).

Power

Marten Falls First Nation relies on diesel-generated power. Although the diesel system was recently upgraded to a capacity of one megawatt, it reached full capacity shortly after completion (Dunick, 2024). Power constraints limit new housing development and restrict expansion of essential services, including healthcare, education, and recreation

(Indigenous Watchdog, 2023). A provincial announcement has been made to connect the community to the power grid, reflecting a desire to transition away from diesel dependence (Dunick, 2024).

Educational Facilities

Educational infrastructure includes Henry Coaster Memorial School, serving students from kindergarten to Grade 8. The school includes cultural and recreational facilities (Teach for Canada, 2024). There are no formal daycare facilities, and childcare is largely provided through informal family arrangements.

Students must leave the community to attend high school in Thunder Bay or Geraldton, often living with host families. This has contributed to family relocation and long-term outmigration, as many students do not return permanently due to limited opportunities (Indigenous Watchdog, 2023).

Postsecondary education access is limited to Thunder Bay institutions. Employment and training services are provided through Kiikenomaga Kikenjigewen Employment and Training Services, offering adult education, apprenticeships, skills training, and driver training (Kiikenomaga Kikenjigewen Employment and Training Services, 2023).

8.3.8.1.4.2 Aroland First Nation

Methods of Transportation in and out of the Community

Aroland First Nation has permanent road access via Highway 643, connecting to Highway 584 and Highway 11. Recent funding agreements with the Ontario government support upgrades to Anaconda and Painter Lake Roads, improving access and regional economic development (Ontario Newsroom, 2025; Ross, 2025).

The community does not have an on-reserve airport but uses the Nakina Airport, located approximately 20 kilometres away. The airport has a 3,500-foot runway and modern facilities and serves as an important regional transportation hub (Municipality of Greenstone, 2021b). Aroland First Nation is also located along the Canadian National Railway line, approximately 750 metres south of Highway 643 (Railway Association of Canada, 2025).

Essential Infrastructure and Services

Water and Wastewater Infrastructure

The water treatment plant, constructed in 1993, draws from three groundwater wells. The community experienced several boil water advisories, including a long-term advisory from 2008 to 2021, which was lifted in June 2021 (CBC News, 2006; First

Nations Drinking Water Settlement, 2024). A short-term advisory also occurred between July and September 2024 (Water Today, 2024). The community currently has a reliable supply of safe drinking water (First Nations Drinking Water Settlement, 2024).

The wastewater system, constructed in 1995, is a Level I treatment system discharging into a wetland. It has a medium overall risk rating, driven primarily by high operational, reporting, and operator risks (Neegan Burnside, 2011). Funding for sewage lagoon remediation was approved in 2017 through the Clean Water and Wastewater Fund (Infrastructure Canada, 2017).

Waste Management Services

The Aroland First Nation solid waste disposal site is located approximately 1 kilometres northeast of the Band Office (Marten Falls First Nation, 2023e). The Municipality of Greenstone landfill in Nakina has significant remaining capacity and is undertaking an Environmental Assessment process to improve regional waste management, including engagement with Aroland First Nation (Municipality of Greenstone, 2024).

Power

Aroland First Nation relies on diesel generation but is set to connect to the Ontario power grid under a recent provincial agreement, reducing reliance on diesel (Ross, 2025). The community also operates a pilot battery energy storage system introduced in 2019, designed to supply power during upstream outages and reduce outage duration by approximately 60 percent (Hydro One, 2019; Zemanek et al., 2021). Historically, the community experienced frequent and prolonged outages between 2013 and 2017 (Hydro One, 2019).

Educational Facilities

Johnny Therriault Memorial School serves students from junior kindergarten to Grade 9 and has capacity to accommodate future growth. High school students attend Geraldton Composite High School, approximately 70 kilometres away. There are no formal daycare facilities, though informal arrangements may exist.

Postsecondary education access is limited to Thunder Bay institutions. Employment and training services are provided through Kiikenomaga Kikenjigewen Employment and Training Services, supporting adult education, apprenticeships, skills development, and workforce readiness (Kiikenomaga Kikenjigewen Employment and Training Services, 2023).

8.3.8.1.5 Housing

8.3.8.1.5.1 Marten Falls First Nation

Housing suitability in Marten Falls First Nation is substantially lower than regional and provincial averages. In 2021, only 71.4 percent of homes met National Occupancy Standard suitability requirements, compared to 90.8 percent in Kenora District and 93.3 percent in Ontario (Statistics Canada, 2021a, 2021b, 2021c). The average household size was 3.5 people, higher than Kenora District and Ontario (both 2.6), contributing to overcrowding (Statistics Canada, 2021a). Although average household size declined from 3.9 in 2016 to 3.5 in 2021, overcrowding remains common, with multiple generations often sharing limited space (Indigenous Watchdog, 2023). Transportation constraints limit the size and quality of housing and furnishings that can be brought into the community

Housing adequacy is a significant concern in Marten Falls First Nation. In 2021, only 42.9 percent of homes were considered adequate, compared to 82.7 percent in Kenora District and 94.3 percent in Ontario (Statistics Canada, 2021a, 2021b, 2021c). A majority of homes (57.1 percent) require major repairs, including structural, plumbing, or electrical work. Reports indicate residents living in unsuitable structures and ongoing loss of housing stock due to fires, averaging one home per year over the past decade (Indigenous Watchdog, 2023). These conditions contribute to heightened health, safety, and psychosocial risks and underscore the urgent need for housing improvements.

Access to home building and repair materials in Marten Falls First Nation is severely constrained by its remote location. The community relies primarily on a winter road that is operational for a limited period each year (approximately 6 weeks in 2023), restricting the timing and volume of material deliveries (CBC News, 2023). Air transport is prohibitively expensive, and barge transport is unreliable due to fluctuating water levels. Declining winter road reliability, high shipping costs, and inadequate servicing infrastructure (including water, wastewater, and power systems) significantly limit housing construction and repair (Perreault, 2024; McGee, 2023). These constraints exacerbate existing housing shortages and inadequacies and have been identified as a key factor contributing to outmigration from the community (Indigenous Watchdog, 2023).

8.3.8.1.5.2 Aroland First Nation

Housing in Aroland First Nation is predominantly single-detached, accounting for approximately 91 percent of dwellings in 2016 (Statistics Canada, 2016d). In 2021, the average household size was 3.1 people, higher than Thunder Bay District (2.2) and

Ontario (2.6), though it declined slightly from 3.3 in 2016 (Statistics Canada, 2016d; 2021d). In 2021, 83.3 percent of homes met suitability standards, lower than Thunder Bay District (96.8 percent) and Ontario (93.3 percent), indicating a higher likelihood of overcrowding in the community (Statistics Canada, 2021d).

Housing adequacy in Aroland First Nation remains below regional and provincial levels. Based on 2021 Statistics Canada 25 percent sample data, 58.3 percent of homes were considered adequate, while 41.7 percent required major repairs (Statistics Canada, 2021d). The prevalence of inadequate housing contributes to stress, reduced quality of life, and challenges related to health, family well-being, and community cohesion, highlighting the need for continued infrastructure improvements.

Unlike remote fly-in communities, Aroland First Nation benefits from year-round road access, allowing more reliable and lower-cost delivery of building and repair materials. Despite this advantage, the community continues to experience housing shortages, overcrowding, and aging infrastructure. Most homes are band-owned, with housing allocated based on need; the median monthly shelter cost was $250 in 2021 (Statistics Canada, 2021d). In 2024, $2.4 million in funding was announced through the Housing Accelerator Fund to support community consultations, serviced lot development, and partnerships with non-profit housing providers (Stimpson, 2024). While these initiatives are expected to improve conditions, housing suitability and adequacy remain ongoing challenges.

8.3.8.1.6 Cultural Preservation and Change

8.3.8.1.6.1 Marten Falls First Nation

The traditional economy of Marten Falls First Nation is deeply rooted in hunting, fishing, trapping, and gathering and has sustained the community for hundreds of years (Marten Falls First Nation, 2023f). Historically, community members traded caribou, moose, beaver pelts, whitefish, and pickerel through the Hudson’s Bay Company, and trapping—particularly of beaver—also played an important role in ecosystem management (Indigenous Watchdog, 2023; Marten Falls First Nation, 2020). Traditional harvesting continues today and includes hunting moose, caribou, deer, waterfowl, and small game; trapping beaver, muskrat, and rabbit; fishing for pickerel, trout, pike, whitefish, and sturgeon; berry harvesting; and gathering timber species (Marten Falls First Nation, 2023f; Teach for Canada, 2024). Participation has declined due to high costs of fuel and equipment, low monetary returns, declining fur markets, and environmental changes, though community members noted that improved road access could increase harvesting activity (AECOM, 2025; Indigenous Watchdog, 2023).

Cultural activities in Marten Falls First Nation are closely tied to the Albany and Ogoki rivers, which historically served as transportation routes and remain central to fishing, hunting, canoeing, and cultural identity. While navigation has become more difficult due to fluctuating water levels and obstructions, cultural practices continue through community events and land-based activities (Marten Falls First Nation Indigenous Knowledge Program; Marten Falls First Nation, 2023b). Annual powwows and feasts are held in late August, and seasonal culture weeks focus on hunting, trapping, and traditional skills (Teach for Canada, 2024). Schools play a role in cultural transmission through instruction in trapping, beading, traditional music, and other land-based skills (Indigenous Watchdog, 2023; Teach for Canada, 2024).

Census data indicate a decline in Ojibway language knowledge in Marten Falls First Nation, from 22 percent in 2016 to 18 percent in 2021 (Statistics Canada, 2021). While Oji-Cree and Cree speakers may be present, they are not reflected in census data. Community members have emphasized that language is closely tied to cultural practices, oral histories, and traditional harvesting, and language preservation is a stated community priority in planning initiatives such as the Community Access Road (Three Roads Forum, 2025, personal communication). Declines in language use may reflect migration, aging fluent speakers, reduced transmission opportunities, or census data variability.

8.3.8.1.6.2 Aroland First Nation

Aroland First Nation has a long-standing traditional economy based on hunting, fishing, trapping, and gathering, dating back to its early settlement during the fur trade era (Aroland First Nation, 2022). Traditional harvesting includes hunting large and small game, trapping furbearers, fishing, berry gathering, and timber harvesting (Aroland First Nation Indigenous Knowledge Program; Peach, 2024). Moose hunting remains culturally significant, with practices emphasizing sharing, particularly with Elders (AECOM, 2025). The community also engages in mixed traditional and market-based activities, notably the Aroland Youth Blueberry Initiative, which supports youth programming, food sovereignty, and economic development while reinforcing cultural practices (LeBlanc, 2014; Stolz et al., 2017). Industrial pressures on traditional species pose emerging challenges to the traditional economy (Aroland Indigenous Knowledge Program; Peach, 2024).

Cultural life in Aroland First Nation is supported through regular community events and programs. The annual Ongonigaming First Nation Pow Wow features traditional drumming, dancing, and feasting (CFNO, 2024). Cultural and social programming is further supported through initiatives such as the Family Well-Being Program and the National Native Alcohol and Drug Abuse Program, which host feasts, land-based

healing events, and spiritual gatherings (NorthWesthealthline, 2024b; 2024c). Family and intergenerational connections are central to cultural continuity, with activities such as berry picking, camping, and traditional crafts reinforcing knowledge transfer and community cohesion (AECOM, 2025). The Elders Lodge will further support cultural participation and intergenerational learning (Government of Canada, 2024a).

Unlike Marten Falls First Nation, Aroland First Nation experienced a slight increase in Ojibway language use, from 35.6 percent in 2016 to 36.1 percent in 2021 (Statistics Canada, 2021). Community members have expressed concern about language loss but also highlighted active efforts to preserve and revitalize Ojibway, including participation in language classes and cultural programming (AECOM, 2025). These initiatives are seen as essential to maintaining cultural identity and supporting the transmission of Indigenous Knowledge.

8.3.8.1.6.3 Regional Indigenous Communities

Constance Lake First Nation - Constance Lake First Nation has relied on land and waterways including the Kenogami, Kabinakagami, Nagagami, Pagwachuan, and Albany rivers, and Constance, Fushimi, and Bannerman lakes (Constance Lake First Nation, 2019). These waterways supported transportation, trade, hunting, fishing, and trapping, following customary laws. Education programs, such as trapping courses at Mamawamatawa Holistic Education Centre, help transmit knowledge (Lowen and MacPherson, 2015). Boreal caribou conservation reflects ecological stewardship (Rabski-McColl, 2022; Four Rivers, 2022). Traditional practices, including wild rice harvesting, fishing, hunting, trapping, and plant gathering, remain important for food security and cultural identity (Constance Lake First Nation, 2025).

Neskantaga First Nation - Neskantaga First Nation's traditional economy followed seasonal cycles of hunting, trapping, fishing, and plant harvesting (Neskantaga First Nation Indigenous Knowledge Program). Meat was preserved for winter, beaver provided food and trade value, and small game hunting reinforced cultural knowledge. Fishing supplied Sturgeon, Whitefish, Northern Pike, Trout, Walleye, Burbot, and Sucker. Sturgeon was culturally and economically important, shared with Elders, and sometimes sold commercially. Today, the community focuses on sturgeon conservation and is concerned about development impacts on moose and caribou (Turner, 2022).

Animbiigoo Zaagi'igan Anishinaabek - Animbiigoo Zaagi'igan's traditional economy relied on seasonal wildlife, fish, and plant harvesting (Animbiigoo Zaagi'igan Anishinaabek Indigenous Knowledge Program). Hunting and trapping included deer, moose, bear, partridge, duck, lynx, and beaver. Fishing supplied trout, salmon, pike, whitefish, and sturgeon. Berry and plant harvesting, especially blueberries, supported

food and income. Trapping and commercial fishing remain sources of livelihood, blending cultural and economic practices (Nextbridge Infrastructure, 2018).

Ginoogaming First Nation - Ginoogaming First Nation historically depended on hunting, trapping, fishing, and plant gathering across Lake Nipigon, Long Lake, northern Lake Superior, and the Pic River watershed (Ginoogaming First Nation Indigenous Knowledge Program). Hunting targets moose and Boreal Caribou, fishing provides Pike, Sucker, and Walleye, and plants such as cedar, sweetgrass, and blueberries support food security and traditions (Beringia Community Planning, 2015). Environmental changes, wildlife health issues, and increased external access threaten these practices and cultural continuity (Beringia Community Planning, 2015).

Long Lake #58 First Nation - Long Lake #58 First Nation's traditional economy relied on hunting, trapping, fishing, and seasonal plant and berry harvesting (Long Lake #58 First Nation Indigenous Knowledge Program). Moose and Boreal Caribou were primary game. Fur trading remained economically important into the 1950s. Traplines were managed to maintain ecological balance, and cultural materials such as porcupine quills supported crafts, integrating economic and cultural systems and sustaining livelihoods and cultural identity (Long Lake #58 First Nation Indigenous Knowledge Program).

8.3.8.1.7 Community and Public Health

8.3.8.1.7.1 Marten Falls First Nation

Access to Health Services and Programs

Marten Falls First Nation delivers a range of health and wellness programs through its health centre, including the Family Well-Being Program, Healthy Babies Healthy Children initiative, and Home and Community Care services, which support physical health, cultural revitalization, and family well-being (211 Ontario North, 2024c). The Muskeg Thunder Clinic provides health education, specialized clinics (for example, diabetes, immunization, sexual health), prenatal and postpartum care, wellness programming, smoking cessation counselling, first aid and CPR training, home visits, and immunization services. The clinic also supports programs such as the Aboriginal Diabetes Initiative, the National Native Alcohol and Drug Abuse Program, and a Suboxone Treatment Program [Victim Support Directory, no date (b)].

Despite these services, access to healthcare is limited. Physician availability in the community is brief and insufficient to meet demand, and services have been described as "inadequate" (Hessey, 2023). Community members rely on scheduled flights to attend medical appointments in Sioux Lookout or Thunder Bay or on medevac services for emergencies, creating barriers to timely care (AECOM, 2025). Leadership has

highlighted ongoing challenges in accessing doctors and transporting sick community members (Hessey, 2023). Improved road access has been identified as a factor that could enhance healthcare access and treatment availability (AECOM, 2025).

Recreation

Marten Falls First Nation has a range of recreational and cultural facilities that support physical activity, social connection, and cultural continuity. An indoor arena is used year-round for hockey, powwows, volleyball, floor hockey, bingo, and card nights. Outdoor and land-based activities such as snowmobiling, hunting, fishing, camping, canoeing, and white water rafting are common, supported by a community boat launch. An annual powwow serves as an important cultural gathering and reinforces community cohesion (Teach for Canada, 2024).

Mental Health and Well-Being

Geographic isolation has contributed to significant mental health and social challenges in Marten Falls First Nation, including youth suicide, alcoholism, and opioid addiction (Indigenous Watchdog, 2023). In January 2025, a Community Safety Bulletin reported two suspected non-fatal overdoses and noted an increasing presence of fentanyl and other potent substances, including contamination of non-opioid drugs (Davidson, 2025).

Mental health pressures are evident across the Nishnawbe Aski Central Region, which includes Marten Falls First Nation. In 2023 to 2024, the Nishnawbe Aski Police Service responded to 484 calls related to mental health, suicide attempts, or suicide threats (Nishnawbe Aski Police Service, 2024). While not community-specific, these data reflect broader regional conditions relevant to Marten Falls.

Historical evidence highlights long-standing psychosocial challenges linked to isolation and limited services. A 2011 Suicide Crisis Prevention report documented high levels of substance use, distressing behaviours among children, and widespread impacts on families and community life (Timpson and O'Gorman, 2011). Barriers identified at that time included limited access to withdrawal medications, such as suboxone, and weak connections to regional treatment and aftercare services (Timpson and O'Gorman, 2011).

Substance use challenges remain significant, with an estimated 80 percent of the workforce currently struggling with addictions. In response, Marten Falls First Nation is working to establish an in-community treatment centre to improve culturally relevant access to addictions care and reduce the need for community members to leave for treatment (AECOM, 2025, personal communication; AECOM, 2025).

Isolation affects physical, mental, social, and economic well-being by limiting access to healthcare, delaying diagnoses, and exacerbating substance-related risks (National Collaborating Centre for Indigenous Health, 2019). Social isolation contributes to feelings of disconnection, family stress, and community strain, with long-term impacts on caregivers, youth, and community cohesion (Timpson and O'Gorman, 2011).

Psychosocial well-being in Marten Falls First Nation is closely tied to land-based relationships, cultural identity, and sense of place (Salerno et al., 2021). Changes to the physical landscape may disrupt these connections, potentially resulting in ecological grief or solastalgia—forms of distress associated with environmental change and loss of place-based identity (Albrecht, 2005; Casey, 1996; Windsor and McVey, 2005; McManus et al., 2014). Existing mental health and addiction pressures may increase vulnerability to such psychosocial effects.

Substance Use

Substance use data are available at the Porcupine Health Unit level rather than for Marten Falls First Nation specifically. Alcohol consumption in the Porcupine Health Unit increased from 79.9 percent in 2015 to 2016 to 86.9 percent in 2019 to 2020, a 7 percent increase, contrasting with declining rates provincially (Public Health Ontario, 2023). Higher alcohol consumption is associated with increased household stress, safety concerns, and compounded vulnerabilities in remote communities where treatment access is limited (Impact Assessment Agency of Canada, 2025).

Illegal drug use is also a concern, compounded by limited access to withdrawal medications and treatment. The identified need for addictions services has contributed to the community's efforts to develop a local treatment centre to address substance use challenges more effectively.

8.3.8.1.7.2 Aroland First Nation

Access to Health Services and Programs

Aroland First Nation provides health services through its health centre, including health awareness initiatives, education and prevention workshops, and specialized clinics focused on immunization, sexual health, and communicable diseases (NorthWesthealthline, 2024c). Hospital services are accessed in Geraldton, and clinic services are accessed in Nakina (Anishinabek Education System, 2024). Child and family services are delivered locally through Tikinagan Child and Family Services (NorthWesthealthline, 2024d).

In 2024, the Government of Canada announced $20.5 million in funding for a new Elders Lodge in Aroland First Nation. The facility will provide 20 private suites, enabling Elders to live independently while receiving care, and will be constructed as a net-zero carbon building (Government of Canada, 2024a).

Recreation

Recreational infrastructure in Aroland First Nation includes an outdoor hockey rink, school playground, and community hall. Johnny Therriault Memorial School supports community use through its gymnasium, computer lab, community kitchen, and public library. An annual powwow held on school grounds is a key cultural event, supporting physical health, cultural continuity, and community engagement (CFNO, 2024).

Mental Health and Well-Being

Aroland First Nation is part of the Nishnawbe Aski Central Region and shares many of the broader mental health and social challenges associated with the region, including pressures related to substance use, service availability, and mental wellness (Indigenous Watchdog, 2023). Regional data indicate 484 mental health-related police service calls in 2023 to 2024, providing context for the mental health pressures affecting communities in the region, including Aroland First Nation (Nishnawbe Aski Police Service, 2024).

Isolation-related challenges, while less severe due to road access, remain relevant. Limited access to specialized healthcare can contribute to delayed diagnoses and reduced continuity of care (National Collaborating Centre for Indigenous Health, 2019). Social stressors such as family strain, intergenerational trauma, and youth mental health concerns are also relevant in the community context (Timpson and O'Gorman, 2011).

Psychosocial well-being in Aroland First Nation is closely connected to cultural identity and land-based relationships. As with other Indigenous communities, changes to land access or environmental conditions may affect cultural continuity and sense of place, potentially contributing to ecological grief or solastalgia (Salerno et al., 2021; Casey, 1996; Windsor and McVey, 2005; Albrecht, 2005; McManus et al., 2014). Existing regional mental health and addiction pressures may influence how such changes are experienced.

Substance Use

Substance use data for Aroland First Nation are reported at the Thunder Bay District Health Unit level. Self-reported alcohol consumption increased slightly from 82.6

percent in 2015 to 2016 to 84.3 percent in 2019 to 2020, indicating relatively stable but persistently high levels of alcohol use compared to declining provincial trends (Public Health Ontario, 2023). Elevated alcohol consumption is associated with household stress, perceptions of safety, and increased psychosocial vulnerability (Impact Assessment Agency of Canada, 2025).

Through consultation and engagement, Aroland First Nation community members identified substance use as an existing concern and expressed worries that drug and alcohol use could increase over time. Concerns were also raised about the potential for increased access to substances through non-band members passing through or accessing the area (Aroland Indigenous Knowledge Program; Peach, 2024).

8.3.8.1.1 Access to Clean Water

Access to clean drinking water has been a long-standing and unresolved issue in Marten Falls First Nation. The community has been under a long-term boil water advisory for approximately 19 years (Law, 2024). Community members emphasized during engagement that access to clean water is essential to health and overall well-being.

8.3.8.1.1.1 Marten Falls Fist Nation

A new 3,600-square-foot water treatment plant was constructed in 2019 to improve water quality (Penn-Co, 2025). However, the advisory remains in place due to ongoing issues with the raw water intake from the Albany River. Indigenous Services Canada is currently undertaking work to address these issues, with completion anticipated in spring 2025 (Government of Canada, 2025b). Challenges associated with the water system have included contamination at the source water intake (Perreault, 2024), infrastructure limitations, and a shortage of qualified personnel to operate the facility (Rinne, 2021).

As a result, Marten Falls First Nation continues to rely on bottled water flown in from Thunder Bay at significant cost. Between 2005 and 2014, the federal government reimbursed approximately $2.13 million for bottled water, with annual shipping costs exceeding $300,000; some estimates indicate costs as high as $40,000 per month (Smith, 2015; Labine, 2012). Funding inconsistencies have resulted in delays in reimbursement, at times requiring the community to wait until the following fiscal year (Cision, 2021).

In June 2021, Marten Falls First Nation joined a class-action lawsuit seeking compensation and long-term solutions for clean water access. In 2022, Indigenous Services Canada discontinued bottled water funding for the community, but funding was

resumed following a 2024 state of emergency related to a sewage spill from the wastewater treatment plant (Achneepineskum, 2024; Law, 2024).

Quality of Surface Water

Marten Falls First Nation members have noted that some drinking water is sourced directly from the Albany River adjacent to the community (Three Roads Forum, 2025, personal communication). Surface water sampling conducted at Nottick Island identified exceedances of drinking water standards for total iron and mercury. A surface water sampling program was therefore undertaken to establish existing conditions in the Albany River, with results documented in **Appendix T**.

8.3.8.1.1.2 Aroland First Nation

Aroland First Nation currently has access to clean drinking water for most residents. The community was previously under a long-term boil water advisory from 2008 to 2021, which raised concerns regarding health, sanitation, and the financial burden of securing safe water (First Nations Drinking Water Settlement, 2024). The advisory was lifted following improvements to the community water system, though detailed information on specific upgrades or funding allocations is limited.

While the main community water system now provides clean water to most residents, a boil water advisory remains in effect for the O'Sullivan Lake Gas Bar Semi-Public Water System. This advisory has been in place since September 2008 and remained active as of October 2024. The advisory does not apply to residential homes or most public buildings (Government of Canada, 2024b).

Quality of Surface Water

Information on Surface Water and Sediment Quality in the Local Study Area can be found in **Appendix T.**

8.3.8.1.1.3 Regional Indigenous Communities

Constance Lake First Nation - Constance Lake First Nation has experienced multiple extended boil water advisories, including periods from July 2010 to July 2012 and from April 2014 to September 2016. In response, a new water treatment plant was opened in 2016, significantly improving access to clean drinking water for the community (Indigenous and Northern Affairs Canada, 2016). Historically, waterways such as the Albany River were integral to seasonal mobility, drinking water access, and transportation (Daigle, 2005).

Fort Albany First Nation - Fort Albany First Nation has faced repeated challenges accessing safe drinking water. A boil water advisory was in place from 2003 to 2006, and a state of emergency was declared between October and December 2024 due to water treatment plant infrastructure failure (Rutherford, 2024). Although there are currently no active advisories, recent events raise concerns regarding infrastructure stability. Community members rely heavily on the Albany River and its tributaries for drinking water, travel, and subsistence fishing, underscoring the cultural and practical importance of water quality (Minkin, 2008).

Attawapiskat First Nation - Attawapiskat First Nation was under a boil water advisory from 2009 to 2021, reflecting long-standing infrastructure limitations. The advisory has since been lifted, improving water safety for residents. The community's traditional territory includes major waterways such as the Attawapiskat, Ekwan, and Albany Rivers, which have historically served as drinking water sources and transportation corridors (Attawapiskat First Nation and Neegan Naynowan Stantec LP, 2015).

Kashechewan First Nation - Kashechewan First Nation continues to experience severe and ongoing challenges accessing clean drinking water and was under a boil water advisory as of November 2025 (Indigenous Services Canada, 2025). The community has experienced repeated evacuations due to water contamination, including a major E. coli incident in 2005 and evacuations in 2024 to 2025 (Baragar, 2025). The community's location on a floodplain and the placement of the water treatment plant downstream from a sewage lagoon make reliable access to clean water unattainable under current conditions. The federal government has committed to relocating the community, though timelines remain uncertain (Baragar, 2025).

Neskantaga First Nation - Neskantaga First Nation has been under a boil water advisory since 1995, making it the longest-running advisory in Canada (Indigenous Services Canada, 2024). Residents rely on surface water sources, increasing vulnerability to contamination. Waterways such as the Attawapiskat, Albany, and Winisk Rivers remain central to cultural practices, travel, and identity (Neskantaga First Nation Indigenous Knowledge Program).

Animbiigoo Zaagi'igan Anishinaabek - No boil water advisories were identified for Animbiigoo Zaagi'igan Anishinaabek. Elders drink water directly from Kenogamisis Lake, indicating reliance on local surface waters. The community depends on fishing for subsistence and commercial purposes and has expressed interest in protecting aquatic habitats, particularly Goldfield Creek and spawning habitats (Animbiigoo Zaagi'igan Anishinaabek Indigenous Knowledge Program).

Ginoogaming First Nation - Ginoogaming First Nation receives drinking water from the Longlac Water Treatment Plant and has no recorded boil water advisories. However, groundwater studies have identified exceedances of Ontario Drinking Water Standards for heavy metals, and community members have reported worsening water quality in Long Lake and contamination in fish from surrounding waterbodies (Beringia Community Planning, 2025; Ginoogaming First Nation Indigenous Knowledge Program). Waterways are integral to cultural practices, traditional travel routes, subsistence, and community healing, reinforcing the importance of water quality to health, culture, and well-being (Ketcheson and Rawn, 2022).

Quality of Surface Water

Regional Indigenous communities located downstream of the Local Study Area may interact with local water systems in a variety of ways, and changes to water or sediment quality could influence these uses. If Project-related effects occur, they may lead to reduced water quality in downstream areas. As a result, these communities may be vulnerable to any decline in overall water quality.

8.3.8.1.2 Traditional Foods

Traditional foods are foundational to Indigenous health, culture, identity, and food security across the Study Area. For thousands of years, Indigenous peoples have relied on hunting, fishing, trapping, gathering, and plant harvesting to sustain communities and maintain relationships with the land and water. Archaeological evidence confirms Indigenous presence and land use in northwestern Ontario for at least 9,000 years, underscoring the long-standing importance of traditional food systems (Stolz et al., 2017).

A Country Foods and Water Use sampling program has been completed, with results shared with Marten Falls First Nation and Aroland First Nation and summarized in **Appendix T**.

8.3.8.1.2.1 Marten Falls First Nation

Traditional foods remain central to the diet, culture, and well-being of Marten Falls First Nation. Community members continue to harvest a wide range of traditional foods, including hunting moose, caribou, deer, geese, partridge, and ptarmigan; trapping beaver, muskrat, and rabbit; fishing for pickerel, trout, pike, whitefish, and sturgeon; and gathering berries such as blueberries, strawberries, and gooseberries, as well as harvesting trees for cultural and practical uses (Marten Falls First Nation, 2023f; Teach for Canada, 2024). These practices support food security, cultural continuity, and psychosocial well-being.

Federal initiatives such as the Harvesters Support Grant Program have been introduced to strengthen food sovereignty, reduce reliance on store-bought foods, and support harvesting culture and community food sharing. Marten Falls First Nation is included in a $4.5 million, two-year funding allocation to Kiikenomaga Kikenjigewen Employment and Training Services to support these objectives (Government of Canada, 2023b; Campbell, 2024). Community leadership has emphasized that returning to traditional foods is critical to addressing health challenges such as diabetes, cancer, and heart disease (Law, 2023).

Availability of traditional foods remains a concern, particularly for culturally significant species such as moose. Community members have expressed concern that increased access to harvesting areas could lead to overharvesting and depletion (Three Roads Forum, 2025, personal communication). While a new community store (Adawegamik) has improved access to store-bought foods, high costs, transportation challenges, and inconsistent supply continue to affect food security (Campbell, 2024; Indigenous Watchdog, 2023; AECOM, 2025). High food prices exacerbate reliance on processed foods and contribute to stress and food insecurity, particularly for families and youth (Law, 2023).

Despite these challenges, programs such as the school healthy food program help address hunger and support student well-being (Indigenous Watchdog, 2023; Indigenous Knowledge Program).

Information on the quality of traditional foods in the Local Study Area is provided in **Appendix T**. Multiple pathways have the potential to affect the quality of country foods, including contaminant deposition, changes in surface water quality, and increased public access to fish. A Country Foods and Water Use study was completed, sampling the quality of Canada goose, moose, beaver, blueberries, and Walleye in the Local Study Area. Results from local tissue sampling are summarized in **Attachment A** of **Appendix T.**

8.3.8.1.2.2 Aroland First Nation

Traditional foods continue to play a vital role in Aroland First Nation's cultural identity, diet, and well-being. Community members harvest moose, caribou, Walleye, whitefish, beaver, grouse, rabbit, and waterfowl, and gather a wide variety of berries, plants, and teas (LeBlanc, 2014; Shared Value Solutions, 2024). Fishing in the Albany River and associated falls remains particularly important for sustaining traditional diets and intergenerational knowledge transfer.

Aroland First Nation has a long history of berry harvesting, particularly blueberries, which have supported subsistence, trade, and economic activity for generations (Stolz et al., 2017). Initiatives such as the Aroland Youth Blueberry Initiative and community feasts reinforce food sharing, food sovereignty, and social cohesion (AECOM, 2025; Stolz et al., 2017). The community also blends traditional harvesting with gardening, greenhouse programs, and food sovereignty initiatives aimed at strengthening resilience and reducing reliance on external food systems (Levkoe et al., 2019; Understanding Our Food Systems, 2024).

Concerns remain regarding perceived contamination of traditional foods from industrial activities, contributing to a shift toward store-bought and processed foods. This shift has implications for health, cultural continuity, and psychosocial well-being (LeBlanc, 2014). While residents have access to local and regional grocery stores, many community members expressed a desire to rely more on land-based foods, noting that improved access to harvesting areas would support greater food independence (AECOM, 2025).

Information on the quality of traditional foods in the Local Study Area is provided in **Appendix T**. Multiple pathways have the potential to affect the quality of country foods, including contaminant deposition, changes in surface water quality, and increased public access to fish. A Country Foods and Water Use study was completed, sampling the quality of Canada goose, moose, beaver, blueberries, and Walleye in the Local Study Area. Results from local tissue sampling are summarized in **Attachment A** of **Appendix T.**

8.3.8.1.2.3 Regional Indigenous Communities

Potential Project-related pathways such as contaminant deposition, water quality changes, and increased public access to fish may influence the quality of traditional foods in the Local Study Area. As species can move outside the Local Study Area and be harvested regionally, these effects may extend to Regional Indigenous communities. Details on existing traditional food quality are available in **Appendix T.**

Constance Lake First Nation - Traditional food harvesting remains central to cultural identity, health, and well-being in Constance Lake First Nation. Community members continue to rely on hunting, fishing, trapping, and gathering across their traditional territory, with moose and caribou being particularly important species. Fishing for Sturgeon, Pike, and Walleye is also common. These practices reflect generations of land-based knowledge and support both physical nourishment and spiritual and social well-being (Constance Lake First Nation, no date; Indigenous Knowledge Program).

Fort Albany First Nation - Traditional foods are integral to daily life and cultural continuity in Fort Albany First Nation. Community members harvest waterfowl, particularly Canada geese, as well as moose, caribou, beaver, muskrat, and marten. Fishing for species such as Whitefish, Walleye, Sturgeon, and Northern Pike remains essential, alongside plant and berry gathering. These activities reinforce intergenerational knowledge transfer and sustain strong connections to land and water despite environmental and socio-economic changes (Kitching and Firelight Research Inc. with Fort Albany First Nation, 2024; Indigenous Knowledge Program).

Attawapiskat First Nation - Traditional food systems in Attawapiskat First Nation have historically followed seasonal cycles tied to the land and waterways. Goose hunting, muskrat trapping, fishing for whitefish, and harvesting caribou and moose formed the basis of subsistence, alongside winter trapping of beaver and small game. While modern influences affect access and reliance, hunting, fishing, and trapping are assumed to continue where feasible, maintaining cultural connections and food security (Cummins, 1992; Long et al., 2017).

Eabametoong First Nation - Eabametoong First Nation maintains strong land-based food practices rooted in seasonal harvesting of moose, geese, fish, and plants. Fishing for Sturgeon, Walleye, and Whitefish continues across community waterways, while berry and plant harvesting supports nutrition, medicine, and cultural continuity. These practices strengthen community ties, support food security, and preserve knowledge passed down through generations (Jacasum, 2007; Eabametoong First Nation, 2016; 2018).

Kasabonika Lake First Nation - Traditional food harvesting in Kasabonika Lake First Nation reflects a communal approach to land use, with shared traplines and seasonal hunting patterns guided by Elders. Moose, caribou, waterfowl, and small game are harvested, with women playing a central role in food preparation and community cohesion. These practices continue where species remain available and are supported by youth-focused initiatives aimed at revitalizing traditional skills (Indigenous Knowledge Program; hme Enterprises, 2019).

Kitchenuhmaykoosib Inninuwug First Nation - Caribou are a critical subsistence and cultural resource for Kitchenuhmaykoosib Inninuwug First Nation. Community members have emphasized the importance of protecting caribou migration routes to allow continued access to traditional foods and the exercise of harvesting rights. Concerns have been raised about road development and habitat disturbance, reflecting the deep connection between traditional foods, land stewardship, and cultural continuity (Nature United, 2022; Ariss and Cutfeet, 2011; Indigenous Knowledge Program).

Kingfisher Lake First Nation - Traditional hunting and trapping remain foundational to food systems and cultural identity in Kingfisher Lake First Nation. Boreal caribou and other game species are harvested within and beyond community territories, reflecting historical mobility and inter-community agreements governing respectful land use. These practices support sustenance, knowledge transfer, and cooperation among neighbouring First Nations (Ontario Parks, 2022; Indigenous Knowledge Program).

Mishkeegogamang First Nation - Traditional foods continue to support health, identity, and resilience in Mishkeegogamang First Nation. Community members harvest moose, beaver, fish such as Sturgeon and Walleye, and a variety of berries, with preservation methods such as smoking and drying allowing food security. Despite historical shifts linked to the fur trade, traditional harvesting remains integral to community life and cultural continuity (Mishkeegogamang First Nation, 2010a; 2010b; 2010c).

Neskantaga First Nation - Neskantaga First Nation maintains strong traditional harvesting practices, including hunting, trapping, fishing, and gathering plants and berries. Sturgeon holds particular cultural importance, alongside species such as Whitefish, Northern Pike, Trout, and moose. The community has raised concerns about development-related disturbances affecting wildlife availability, underscoring the importance of protecting traditional food systems for cultural survival and food security (Neskantaga First Nation, 2022; Hale, 2024; Indigenous Knowledge Program).

Nibinamik First Nation - Traditional food systems in Nibinamik First Nation are grounded in seasonal hunting, fishing, and trapping practices that emphasize respect for the land and animals. Moose, caribou, waterfowl, and fish form dietary staples, supported by preservation techniques such as smoking and drying. These practices are deeply tied to spiritual values, mobility, and intergenerational knowledge transfer, reinforcing cultural identity and resilience (Indigenous Knowledge Program).

Kashechewan First Nation - Kashechewan First Nation continues to rely on seasonal harvesting of traditional foods, with spring and fall being critical periods for waterfowl and large game such as moose and caribou. Fishing for Pike, Walleye, Sturgeon, and Whitefish is most active in summer, while trapping occurs primarily in fall and winter. These practices support subsistence, food sharing, and cultural continuity within the community (Kashechewan First Nation Existing Conditions Report; MNP LPP, 2024b).

Wapekeka First Nation - Traditional foods remain important to Wapekeka First Nation, even as the number of year-round hunters has declined. Moose, beaver, geese, fish, and berries continue to be harvested and shared among families, reinforcing cultural values and social ties. Seasonal hunting, fishing, and gathering practices reflect

enduring knowledge systems and support community well-being (Thompson et al., 2018; Robidoux et al., 2021).

Wawakapewin First Nation - Wawakapewin First Nation has historically supported regional food security through flexible and overlapping harvesting areas shared with neighbouring communities. Large game such as moose and Boreal caribou were harvested to support both local and regional needs. Today, the community is revitalizing traditional harvesting methods and complementing them with local food production initiatives to strengthen food sovereignty and resilience (Indigenous Knowledge Program; Smith, 2011).

Webequie First Nation - Traditional harvesting remains central to food security and cultural life in Webequie First Nation. Community members hunt, trap, and fish for species including caribou, moose, geese, and fish, with seasonal spring and fall hunts holding particular importance. Preservation methods allow food availability year-round, and cultural practices emphasize respect and full use of harvested animals (Webequie First Nation, no date; Indigenous Knowledge Program).

Weenusk First Nation - Traditional foods are fundamental to Weenusk First Nation identity and well-being, with caribou being the most culturally significant species and harvested year-round. Moose, fish, and waterfowl also support subsistence, guided by seasonal cycles. Stewardship and conservation efforts are central to maintaining these resources remain available for future generations (Semeniuk, 2022; Nerberg, 2025; Indigenous Knowledge Program).

Wunnumin Lake First Nation - Wunnumin Lake First Nation continues to rely on traditional hunting and resource gathering for food security and cultural continuity. Boreal caribou and moose are key species, harvested within family-based territories that support intergenerational learning. These practices are essential to survival, identity, and the transmission of land-based knowledge (Ontario Parks, 2022; Indigenous Knowledge Program).

Animbiigoo Zaagi'igan Anishinaabek - Traditional food harvesting in Animbiigoo Zaagi'igan Anishinaabek has historically been seasonal, with hunting, fishing, and berry gathering forming the basis of subsistence. Fishing remains particularly important, with many community members continuing to rely on local waterways for most of their meat, alongside growing commercial fishing activities. Berry harvesting and plant gathering also contribute to food security and cultural practices (Indigenous Knowledge Program).

Ginoogaming First Nation - Ginoogaming First Nation maintains strong traditions of hunting, trapping, fishing, and plant harvesting across a broad territory. Moose, Boreal caribou, and fish such as Pike and Walleye are key food sources, though community members have observed changes in wildlife health and availability. Despite these challenges, traditional plant harvesting—often led by women—continues to support a diverse and culturally significant food system (Indigenous Knowledge Program).

Long Lake #58 First Nation - Traditional food practices in Long Lake #58 First Nation include hunting, fishing, and gathering plants, berries, and fungi. Moose and caribou have historically been important game species, while fishing in lakes and rivers such as Kenogamisis Lake remains central to community diets. Adaptive harvesting practices, including rotating traplines, reflect a deep understanding of ecological sustainability and resource balance (Indigenous Knowledge Program).

8.3.8.1.3 Public Safety

This section describes existing conditions related to public safety for Marten Falls First Nation and Aroland First Nation, including challenges associated with driver licensing, road safety, access to emergency services, and violence and harassment. These components influence both physical safety and psychosocial well-being and are shaped by remoteness, transportation access, service availability, and broader socio-economic conditions. Particular attention is given to risks faced by Indigenous women, girls, and gender-diverse people.

8.3.8.1.3.1 Drivers Licenses

Marten Falls First Nation

Residents of Marten Falls First Nation face significant barriers to obtaining driver's licenses, which has implications for employment opportunities, safety, and mobility. The Addressing Disparity in Employment Rates for Indigenous People in Remote Communities report (Kiikenomaga Kikenjigewen Employment and Training, 2017) highlights that many employers assume workers hold a valid driver's license, creating barriers for community members who are unable to access licensing services. Due to Marten Falls' remote location, residents must travel to urban centres such as Thunder Bay or Geraldton to complete testing, which is often cost-prohibitive and logistically difficult.

To address this challenge, Kiikenomaga Kikenjigewen Employment and Training Services introduced a Driver's License Pilot Project to increase awareness of licensing requirements and provide G1 testing within remote First Nations, including Marten Falls First Nation. The program received 70 applicants, 9 of whom were from Marten Falls

First Nation. Of the 29 applicants who successfully obtained a driver's license, 2 were from Marten Falls First Nation (Kiikenomaga Kikenjigewen Employment and Training, 2017).

The pilot project identified several barriers relevant to Marten Falls First Nation, including limited community access following the discontinuation of direct flights in 2017, communication challenges related to staffing changes, inadequate road signage, and language and literacy barriers. Additional challenges included the lack of valid identification among applicants and difficulty accessing prescription eyewear required for testing due to high costs and limited vision services in remote communities.

Aroland First Nation

Residents of Aroland First Nation experience similar challenges in accessing driver training and licensing services, as these services are typically only available in larger regional centres. Difficulty obtaining driver's licenses and vehicle registration in compliance with the *Highway Traffic Act* has been identified as a contributor to unsafe driving behaviour and increased accident risk in Far North communities, including Aroland First Nation (NorthWinds Environmental Services, 2023).

8.3.8.1.3.2 Road Safety

Marten Falls First Nation

Marten Falls First Nation is not connected to the provincial highway network by an all-season road; therefore, road safety considerations are limited to the seasonal winter road network. The *Highway Traffic Act* applies to winter roads, requiring licenced drivers and registered vehicles.

Safety concerns associated with winter road use include variability in ice thickness, which can lead to premature access and risk of vehicle breakthroughs. Inadequate signage contributes to confusion around speed limits and safe travel practices, particularly in technically challenging areas. While the Ontario Provincial Police and Nishnawbe Aski Police Service have authority to enforce traffic laws on winter roads, patrols are infrequent due to limited resources, and jurisdictional responsibility for enforcement and emergency response is not always clear (NorthWinds Environmental Services, 2023).

Additional concerns include the lack of standardized training requirements for commercial truck drivers operating on winter roads and the absence of mandatory provincial technical and safety standards for winter road construction and operation. Current guidelines are voluntary, and there is no comprehensive provincial inspection

program for winter roads, with the exception of permanent water crossing inspections introduced in 2015 (NorthWinds Environmental Services, 2023). These conditions contribute to ongoing safety risks for community members and commercial users.

Aroland First Nation

Community members from Aroland First Nation experience similar safety concerns on winter roads as those described for Marten Falls First Nation. In addition, Aroland First Nation is connected to the provincial highway system and therefore experiences road safety risks associated with all-season road travel.

Traffic volume data from 2021 indicate moderate use of nearby highways, with annual average daily traffic counts of 320 vehicles on Highway 643 north of Burroughs, 420 vehicles near Nakina, and 200 vehicles on Highway 584 at Cavell Road (Ontario Ministry of Transportation, 2024). News reports have documented several vehicle accidents near Aroland First Nation since 2022, including a fatal single-vehicle collision north of Nakina, underscoring ongoing road safety concerns in the area (SNnewsWatch, 2022).

8.3.8.1.3.3 Access to Emergency Services

Marten Falls First Nation

Access to emergency services is a critical determinant of public safety and psychosocial well-being in Marten Falls First Nation. Limited access to fire, medical, and emergency response services increases stress during crises, reinforces feelings of isolation, and heightens anxiety among community members and caregivers.

Marten Falls First Nation does not have a fire station or fire truck (Indigenous Watchdog, 2023), and the community has identified ongoing challenges related to emergency medical response, including the absence of an ambulance. As noted by a community member: “We are struggling to transport our sick people” (Hessey, 2023). While medical transportation services are available for scheduled appointments, urgent and emergency care is difficult to access due to distance and limited local resources.

Policing services are provided by the Nishnawbe Aski Police Service, which serves most Nishnawbe Aski Nation communities. Marten Falls First Nation is located within the Central Region of Nishnawbe Aski Police Service. In 2017, the community was served by two constables, increasing to four constables by 2024 (Nishnawbe Aski Police Service, 2018, 2024). While this increase has improved capacity, emergency response remains constrained by geography, transportation limitations, and overall resource availability.

Aroland First Nation

Aroland First Nation has relatively improved access to emergency services compared to more remote communities due to its proximity to Nakina. The community has a volunteer fire department, and ambulance services are provided by Nakina, located approximately 15 minutes away (NorthWesthealthline, 2024a). While this proximity improves response times, reliance on external ambulance services may still contribute to anxiety during urgent medical situations. Volunteer fire services also depend on local training capacity and equipment availability, which can affect readiness during emergencies.

Policing services are provided by the Nishnawbe Aski Police Service. In 2018, Aroland First Nation was served by two constables; by 2024, this increased to two sergeants and four constables (Nishnawbe Aski Police Service, 2018, 2024). This expanded presence has improved policing capacity, although serious incidents may still heighten perceptions of vulnerability and stress within the community.

8.3.8.1.3.4 Violence and Harassmen

Marten Falls First Nation and Aroland First Nation

Gender-based violence encompasses physical, sexual, psychological, and economic harm rooted in systemic inequality and discrimination and disproportionately affects Indigenous women, girls, and gender-diverse people (Government of Canada, 2025c). Indigenous women experience significantly higher rates of physical and sexual violence than non-Indigenous women, with 56 percent reporting physical assault and 46 percent reporting sexual assault (Assembly of First Nations, 2024).

Between 2001 and 2014, Indigenous women were murdered at rates up to 12 times higher than non-Indigenous women, with a higher proportion of homicides occurring in public spaces such as streets and highways (Department of Justice Canada, 2017). Indigenous women are also disproportionately affected by human trafficking, representing approximately 50 percent of victims despite comprising only 4 percent of Canada’s population (National Inquiry into Missing and Murdered Indigenous Women and Girls, 2019).

Remote communities face heightened risks due to isolation, limited access to services, housing insecurity, substance use, and intergenerational trauma linked to residential schools (Assembly of First Nations, 2021). The presence of temporary or permanent work camps near Indigenous communities may introduce additional pressures related to harassment, violence, substance misuse, and exploitation (Gibson and Klinck, 2005; Gibson et al., 2017). In contrast, the absence of all-season road access at Marten Falls

First Nation has historically allowed greater control over community access, positively influencing perceptions of safety and stability.

Violence, harassment, and exposure to crime are important determinants of psychosocial well-being in Marten Falls First Nation and Aroland First Nation. While community-specific crime statistics are not available, the Central Region of the Nishnawbe Aski Police Service recorded 10,191 crime occurrences between January and December 2023. Common incidents included assaults, domestic disputes, mental health-related calls, and personal well-being checks, with a higher frequency of serious violent crimes than many southern Ontario jurisdictions (Nishnawbe Aski Police Service, 2024).

The Central Region recorded 355 violent offenses, including 239 assaults and 45 sexual offenses, alongside 507 alcohol- and drug-related offenses and 484 mental health-related incidents. These patterns reflect broader regional challenges that influence perceptions of safety and contribute to stress, fear, and social isolation. During engagement, community members also raised concerns about lateral violence, including bullying, gossip, and exclusion, which can undermine community cohesion and well-being (Mueller, 2023).

Although no community-specific human trafficking data are available for Marten Falls First Nation or Aroland First Nation, national research highlights heightened vulnerability among Indigenous women, girls, and gender-diverse people, particularly in remote communities where individuals may travel frequently to access services and become disconnected from cultural support networks (Roudometkina and Wakeford, 2018).

8.3.8.1.4 Biophysical Factors Influencing Human Health

The existing conditions for biophysical topics such as air quality, noise and vibration, soil quality, sediment quality, human land use, and wildlife are covered in their own discipline reports. For the purposes of human health, these findings were reviewed to understand where standards were exceeded and what this could mean for potential exposure. A country foods and water sampling program was also completed to support this work, and the results will be shared with Marten Falls First Nation and Aroland First Nation. For more information, refer to **Appendix T**.

8.3.8.2 Regional Study Area

8.3.8.2.1 Sustainable Population Growth

8.3.8.2.1.1 Greenstone Municipality

According to Statistics Canada, between 2011 and 2021, the population of Greenstone declined from 4,725 to 4,309 residents. In 2016, the population was 4,636 (Statistics Canada, 2011, 2016, 2021). Over this period, population change occurred alongside shifts in age composition. Refer to **Table 8.3-35** for more information.

In 2021, Greenstone's population included approximately 2,200 men and 2,100 women. Men represented approximately 51 percent of the total population, while women accounted for approximately 49 percent. In 2016, men represented approximately 51 percent of the population, and a similar distribution was reported in 2011 (Statistics Canada, 2011i, 2016f, 2021f). Refer to **Table 8.3-35** for more information.

8.3.8.2.1.2 Thunder Bay

According to Statistics Canada, Thunder Bay's Metropolitan Area population increased slightly from 121,600 in 2011 to 121,621 in 2016 and to 123,258 in 2021. Changes in population size over this period occurred alongside changes in age composition. Refer to **Table 8.3-36** for more information.

In 2021, Thunder Bay Metropolitan Area had approximately 60,910 men and 62,350 women. Women represented approximately 51 percent of the population, while men accounted for approximately 49 percent. This distribution is similar to that reported in 2016 and 2011 (Statistics Canada, 2011j, 2016g, 2021e). Refer to **Table 8.3-36** for more information.

Table 8.3-35: Age and Gender Distribution, 2011, 2016, 2021 for Greenstone Municipality

Population Group and Characteristic	2011 Total	2011 Men	2011 Women	2016 Total	2016 Men	2016 Women	2021 Total	2021 Men	2021 Women
Greenstone Total Population	**4,725**	**2,425**	**2,300**	**4,636**	**2,375**	**2,260**	**4,309**	**2,200**	**2,100**
Ages 0 to 14 Percent of Total Population	18.2	19.8	16.1	16.7	17.9	15.7	16.8	17	16.6
Ages 15 to 64 Percent of Total Population	68.1	65.8	77.6	65.4	64.8	66.2	61.8	62.6	61.0
Ages 65 and over Percent of Total Population	13.9	13.6	14.1	17.7	17.5	17.9	21.2	20.2	22.1
Ontario Total Population	**12,851,820**	**6,263,140**	**6,588,685**	**13,448,494**	**6,559,390**	**6,889,105**	**14,223,945**	**6,970,855**	**7,253,085**
Ages 0 to 14 Percent of Total Population	17.0	31.2	16.1	16.4	17.3	15.6	15.8	16.6	15.1
Ages 15 to 64 Percent of Total Population	75.1	75.9	74.4	66.8	67.3	66.4	65.6	66.2	65.0
Ages 65 and over Percent of Total Population	14.6	13.3	15.9	16.7	15.5	17.9	18.5	17.2	19.8

Table 8.3-36: Age and Gender Distribution, 2011, 2016, 2021 for Thunder Bay

Population Group and Characteristic	2011 Total	2011 Men	2011 Women	2016 Total	2016 Men	2016 Women	2021 Total	2021 Men	2021 Women
Thunder Bay Total Population	**121,600**	**59,250**	**62,350**	**121,621**	**59,690**	**61,930**	**123,258**	**60,910**	**62,350**
Ages 0 to 14 Percent of Total Population	14.8	15.4	14.3	14.6	15.3	13.9	14.3	14.9	13.7
Ages 15 to 64 Percent of Total Population	74.4	75.7	73.4	65.7	66.5	64.8	63.7	64.4	63.1
Ages 65 and over Percent of Total Population	17.2	15.5	18.7	19.8	18.2	21.3	21.9	20.7	23.2
Ontario Total Population	**12,851,820**	**6,263,140**	**6,588,685**	**13,448,494**	**6,559,390**	**6,889,105**	**14,223,945**	**6,970,855**	**7,253,085**
Ages 0 to 14 Percent of Total Population	17.0	31.2	16.1	16.4	17.3	15.6	15.8	16.6	15.1
Ages 15 to 64 Percent of Total Population	75.1	75.9	74.4	66.8	67.3	66.4	65.6	66.2	65.0
Ages 65 and over Percent of Total Population	14.6	13.3	15.9	16.7	15.5	17.9	18.5	17.2	19.8

8.3.8.2.2 Labour Market Dynamics

8.3.8.2.2.1 Kenora District

Labour Force

The Kenora District working-age population (15 years and older) in 2024 was estimated to be around 55,300, with an even split between men and women. The population has increased between 2011 and 2024 by approximately 26 percent, or an average of 1.8 percent per year. Approximately 57 percent of the working-age population participated in the labour force in 2024, with a seasonal work force of 12 percent and 9 percent that were self-employed. Approximately 52 percent of the working-age population was employed in 2024, with 35 percent working full time. The 2024 unemployment rate was 9 percent, which has decreased over the years largely due to the decline in men's unemployment rate.

Kenora District's increasing labour force is relatively diversified across the available industries (classified by the North American Industry Classification System categories). Based on 2024 estimates, the main industries overall include health care and social assistance, public administration, retail trade and educational services. The largest industries for men were construction, public administration, retail trade, and health care and social assistance. The most dominant industry for women was health care and social assistance, followed by educational services, public administration, and retail trade (Statistics Canada, 2011e, 2016b, 2021b).

Earnings

The earnings for the Kenora District show that the average after-tax income in 2024 was about $47,200, which was $17,300 above the average disposable income in Marten Falls First Nation. The average after-tax income for the Kenora District in 2024 was 46 percent higher than in 2011, which represents an annual growth of 2.9 percent. This is similar to Ontario's average after-tax income growth of 45 percent during this period, or 2.9 percent per year. Unlike with Marten Falls First Nation, the Kenora District's average after-tax income was higher for men ($51,100) than for women ($43,400). The average after-tax income for men grew 39 percent since 2011, or 2.5 percent per year, while for women it grew 56 percent, or 3.5 percent annually (Statistics Canada, 2011e, 2016b, 2021b).

Educational Attainment

Over the past decade, the Kenora District has seen an increase in the level of education being attained by its residents. In 2021, 30.9 percent of the population aged 15 years

and over had no certificate, diploma, or degree. This marks an improvement from 35.2 percent in 2016, indicating a positive trend towards higher educational attainment. This figure remains higher than the provincial average in Ontario, where only 15.3 percent of individuals lacked formal educational qualifications in 2021 (Statistics Canada, 2011e, 2016b, 2021b).

8.3.8.2.2.2 Thunder Bay District

Labour Force

The Thunder Bay Census District working-age population (15 years and older) in 2024 was estimated to be around 133,200, with equal representation between men and women. The 2024 population has increased about 10 percent since 2011, or 0.7 percent each year on average. Approximately 58 percent of the working-age population participated in the labour force in 2024, with about 11 percent of the labour force being seasonal and around 9 percent self-employed. Around 52 percent of the working-age population was employed in 2024, with about 30 percent working full time. The unemployment rate was estimated to be about 11 percent overall in 2024; this has increased since 2011, especially among women.

The main industries overall include health care and social assistance, retail trade, educational services, and construction. The largest industries for men were construction, retail trade, transportation and warehousing, and public administration. Women's labour force was largely concentrated in health care and social assistance, followed by retail trade, educational services, and public administration (Statistics Canada, 2011n, 2016g, 2021e).

Earnings

Earnings for the Thunder Bay District implies that the average after-tax income in 2024 was about $48,800, which was notably $22,200 above the average after-tax income in Aroland First Nation. The average after-tax income for the Thunder Bay District in 2024 was 47 percent higher than in 2011, which represents an annual growth of 3.0 percent. This is similar to Ontario's average after-tax income growth of 45 percent during this period, or 2.9 percent per year. Unlike with Aroland First Nation, the Thunder Bay District's average after-tax income was higher for men ($53,900) than for women ($43,700). The average after-tax income for men grew 41 percent since 2011, or 2.7 percent per year, while for women it grew 54 percent, or 3.4 percent annually (Statistics Canada, 2011h; 2016g; 2021e).

Educational Attainment

Over the past decade, the Thunder Bay District has experienced changes in educational attainment among its residents. In 2021, 18 percent of the population aged 15 years and over had no certificate, diploma, or degree. This marks an improvement from 21.2 percent in 2016, indicating a positive trend towards higher educational attainment. This figure remains higher than the provincial average in Ontario, where only 15.3 percent of individuals lacked formal educational qualifications in 2021 (Statistics Canada, 2016g; 2021e).

8.3.8.2.2.3 Cochrane District

Labour Force

The Cochrane District working-age population (15 years and older) in 2024 was estimated to be around 69,100, with equal representation between men and women. The 2024 population has increased only about 6 percent since 2011, or 0.4 percent each year on average. Approximately 59 percent of the working-age population participated in the labour force in 2024, with about 10 percent of the labour force being seasonal and around 9 percent self-employed. Around 54 percent of the working-age population was employed in 2024, with about 32 percent working full time. The unemployment rate was estimated to be about 9 percent overall in 2024, which has increased slightly over the years, especially among women.

Based on Cochrane District's labour force in 2024, the main industries overall include health care and social assistance, retail trade, mining, quarrying, and oil and gas extraction, and educational services. The largest industries for men were mining, quarrying, and oil and gas extraction, construction, retail trade, and manufacturing. Women's labour force was largely concentrated in health care and social assistance, followed by educational services, retail trade, and public administration (Statistics Canada, 2011k; 2016h; 2021g).

Earnings

Earnings for the Cochrane District shows that the average after-tax income in 2024 was about $49,200. The average after-tax income for the Cochrane District in 2024 was 46 percent higher than in 2011, which represents an annual growth of 3.0 percent. This is similar to Ontario's average after-tax income growth of 45 percent during this period, or 2.9 percent per year. The average after-tax income was higher for men ($55,600) than for women ($42,800). The average after-tax income for men grew 40 percent since 2011, or 2.6 percent per year, while for women it grew 56 percent, or 3.5 percent annually (Statistics Canada, 2011k; 2016h; 2021g).

Educational Attainment

Over the past decade, the Cochrane District has seen changes in the level of education attained by its residents. In 2021, 24.1 percent of the population aged 15 and over had no certificate, diploma, or degree. This marks an improvement from 27.6 percent in 2016. This remains higher than the provincial average in Ontario, where only 15.3 percent of individuals did not obtain a certificate, diploma, or degree.

8.3.8.2.2.4 Greenstone Municipality

Labour Force

The Greenstone Municipality working-age population (15 years and older) in 2024 was estimated to be around 3,800, with an equal representation between men and women. The 2024 population has increased only about 1 percent since 2011, or 0.1 percent each year on average. Approximately 55 percent of the working-age population participated in the labour force in 2024, with about 14 percent of the labour force being seasonal and around 6 percent self-employed. Around 51 percent of the working-age population was employed in 2024, with about 31 percent working full time. The unemployment rate was estimated to be about 9 percent overall in 2024, which has decreased over the years, particularly among men.

Based on Greenstone Municipality's labour force in 2024, the main industries overall include health care and social assistance, educational services, retail trade, and public administration. The largest industries for men were construction, transportation and warehousing, retail trade, and public administration. Women's labour force was largely concentrated in health care and social assistance, followed by educational services, retail trade, and public administration (Statistics Canada, 2011l; 2016f; 2021f).

Earnings

The earnings table below for the Greenstone Municipality shows that the average after-tax income in 2024 was about $48,300. The average after-tax income for the Greenstone Municipality in 2024 was 48 percent higher than in 2011, which represents an annual growth of 3.0 percent. This is similar to Ontario's average after-tax income growth of 45 percent during this period, or 2.9 percent per year. The average after-tax income was higher for men ($52,100) than for women ($44,500). The average after-tax income for men grew 44 percent since 2011, or 2.9 percent per year, while for women it grew 52 percent, or 3.3 percent annually (Statistics Canada, 2011l; 2016f; 2021f).

Educational Attainment

Over the past decade, the Greenstone District has seen changes in the level of education attained by its residents. In 2021, 27.1 percent of the population aged 15 years and over had no certificate, diploma, or degree. This marks an improvement from 32.2 percent in 2016, indicating a positive trend towards higher educational attainment. This figure remains higher than the provincial average in Ontario, where only 15.3 percent of individuals lacked formal educational qualifications in 2021.

8.3.8.2.2.5 Ontario

Labour Force

Ontario's working-age population (15 years and older) in 2024 was 13.4 million, with slightly more women than men. The population has notably expanded since 2011; about 28 percent, or 1.9 percent each year on average. Approximately 65 percent of the working-age population participated in the labour force in 2024 (same as the national average). About 8 percent of the labour force was seasonal, and around 15 percent was self-employed. Ontario's employment rate was 61 percent in 2024, with about half of the individuals working full time. The unemployment rate was about 7 percent overall in 2024 (for both men and women), which has normalized since its high 2021 level (12 percent).

The key industries of Ontario's labour force in 2024 have been health care and social assistance, retail trade, professional, scientific and technical services, and manufacturing. The largest industries for men were construction, manufacturing, retail trade, and professional, scientific and technical services. Women's labour force was largely concentrated in health care and social assistance, followed by retail trade, educational services, and professional, scientific and technical services (Statistics Canada, 2011f; 2016b; 2021c).

Earnings

Ontario's average after-tax income in 2024 was about $51,200, which was higher than the average after-tax income in the Kenora District ($47,200) and the Thunder Bay District ($48,800). The average after-tax income for Ontario in 2024 was 45 percent higher than in 2011, which represents an annual growth of 2.9 percent. Ontario's average after-tax income was higher for men ($57,400) than for women ($45,300). The average after-tax income for men grew 40 percent since 2011, or 2.6 percent per year, while for women it grew 52 percent, or 3.3 percent annually (Statistics Canada, 2011f; 2016b; 2021c).

8.3.8.2.3 Economy

8.3.8.2.3.1 Local Businesses and Commercial Activities

The City of Kenora serves as a central hub for construction activities. From 2010 to 2022, the City of Kenora issued construction permits valued at over $431 million. This valuation encompasses both commercial / governmental and residential projects, each representing approximately 50 percent of the total permit value (City of Kenora, 2025a). Upcoming projects include the twinning of the Trans-Canada Highway and the construction of the All-Nations Hospital (City of Kenora, 2025b). The city's Economic Development Department facilitates connections between businesses and local contacts, as well as access to funding opportunities.

The City of Thunder Bay is the regional hub of northwestern Ontario. The city sits on the shores of Lake Superior, which is the world's largest freshwater lake. It is a natural gateway by seaway, road, rail and air to western Canada. Northwestern Ontario is one of the world's leading mining exploration and development areas. Key sectors in the region include aerospace, mining, forestry, bioeconomy, health sciences, information and communication technologies, manufacturing, and tourism (Thunder Bay Community Economic Development Commission, no date).

Ontario's real Gross Domestic Product, which shows the provincial economic value after adjusting for inflation, is estimated to have grown 29 percent from 2011 to 2024. That is equivalent to 2.0 percent on average each year, higher than Canada's growth rate of 1.8 percent during this period. Ontario is Canada's largest economy, accounting for 39 percent of its real Gross Domestic Product. Following the onset of COVID-19 in 2020, Ontario's economy was able to recover relatively quickly in 2021, surpassing its pre-COVID real Gross Domestic Product level. Most recent estimates show that Ontario's real Gross Domestic Product was $942.8 billion in 2024, recording an annual growth rate of 1.1 percent (growing at same pace as Canada's real Gross Domestic Product).

The Consumer Price Index captures the average prices of goods that are consumed domestically. Annual inflation rate is measured by the Consumer Price Index's annual percentage change. Increase in consumer prices decreases the real wealth and purchasing power of consumers. Looking at Ontario's Consumer Price Index during the 2011 to 2024 period, the province experienced a 35 percent increase in consumer prices, or about 2.4 percent annually on average. This is slightly above the national inflation of 34 percent, or 2.3 percent per year. Recently, following years of high inflation, Ontario's Consumer Price Index and Canada's Consumer Price Index both grew 2.4 percent in 2024. Both rates are considered high, as they remain above Canada's inflation target rate of 2.0 percent.

The experience of comparable road projects in Canada has been that the improved level of access provided by the new road leads to more consumer choices and lower prices of goods. It is reasonable to expect that the new Community Access Road will provide more consumption choices at lower prices.

The experience of comparable road projects in Canada has been that the improved level of access provided by the new road leads to more consumer choices and lower prices of goods. It is reasonable to expect that the new Community Access Road will provide more consumption choices at lower prices. **Table 8.3-37** shows the results from a report published by Wendimu, Desmarais, and Martens (2018) in the University of Manitoba's Canadian Food Studies Journal, which looked at the effect of an all-weather road access on the prices of food items across stores in Manitoba.

Communities with an all-weather road generally showed significantly lower prices compared to communities without an all-weather road, with an average decrease of 22 percent given the above food items. Leading price differences were observed among Pepsi (62 percent decrease), whole milk (48 percent decrease), bananas (42 percent decrease), and tomatoes (40 percent decrease). It is important to highlight that incomes are generally lower in remote and Indigenous communities compared to urban centres. Also, every Indigenous community is specific and differences in prices can occur due to other differences between communities, such as their consumption preferences. It is useful to recognize that experiences from other communities with new road access suggest that the overall cost of living is likely to decline over time.

8.3.8.2.3.2 Planning

The Prosperity and Growth Strategy for Northern Ontario was developed in 2018 by the Government of Canada to enhance and build on the ongoing federal and provincial programs and collaborations to address the needs of Northern Ontario's communities and its residents (Government of Canada, 2024c).

The Prosperity and Growth Strategy for Northern Ontario defines three main priorities for the region:

- Supporting innovation. Expand and strengthen the regional innovation ecosystems to support competitive businesses and economic growth;
- Growing companies. Enhance the delivery of supports for business start-ups and scale-ups to grow competitive companies and stimulate economic growth; and
- Building stronger communities. Help communities better respond to opportunities and challenges.

Table 8.3-37: Average Food Prices (2018)

Food Item (Canadian Dollars)	Winnipeg (11 stores)	Non-First Nations Urban Centres in Northern Manitoba (7 stores)	First Nations Communities with All-weather Road (13 stores)	First Nations Communities without All-weather Road (6 stores)	First Nations Percentage Difference from All-weather Road
Skim milk (1 litre)	1.55	1.56	2.23	2.65	-16
Low-fat milk (1 litre)	1.58	1.57	2.43	2.42	0
Low-fat milk (2 litre)	3.31	3.45	3.82	4.12	-7
Fat-reduced milk (1 litre)	1.66	1.67	2.04	3.06	-33
Fat-reduced milk (2 litre)	3.34	3.48	3.86	4.99	-23
Fat-reduced milk (4 litre)	4.79	5.08	6.99	8.11	-14
Whole milk (4 litre)	5.25	5.60	4.43	8.56	-48
Lactose-free milk (2 litre)	5.32	5.70	5.84	6.15	-5
Chocolate milk (4 litre)	5.29	6.43	8.73	9.64	-9
Ground beef	11.54	10.90	12.24	16.89	-28
Chicken breast	14.50	17.45	17.17	21.99	-22
Chicken thighs	8.77	9.27	10.93	15.49	-29
Pork chops	12.48	10.99	12.92	19.04	-32
Eggs	2.96	3.13	3.77	3.90	-3
Apples	3.36	4.36	5.66	7.41	-24
Bananas	1.81	1.64	2.76	4.72	-42
Oranges	3.52	3.45	4.65	3.80	22
Grapes	5.25	4.72	8.10	9.93	-18
Onions	1.83	2.93	2.92	3.17	-8
Tomatoes	3.94	5.17	6.54	10.86	-40
Potatoes	1.30	1.29	2.03	2.21	-8
Carrots	1.82	2.63	3.02	4.46	-32
Lettuce	1.84	2.20	2.37	2.58	-8
Energy drink	2.70	3.09	3.36	3.75	-10
Potato chips	3.39	3.39	4.57	5.72	-20
Pepsi (2 litre)	2.42	2.33	3.34	8.80	-62
Pepsi (12 pack)	5.57	5.88	7.61	20.25	-62
Wheat flour (10 kilograms)	17.01	-	22.84	35.34	-35
Coffee (930 grams)	17.58	-	21.09	26.12	-19
Sugar (2 kilograms)	3.58	-	4.89	6.97	-30

Several Indigenous organizations and partnerships have developed in the Regional Study Area to meet these goals, including Minodahmun Development, a partnership between Animbiigoo Zaagi'igan Anishinaabek, Aroland First Nation and Ginoogaming First Nation and a development corporation focused in the mining sector (Minodahmun Development LP, 2020).

"Matawa Economic Development works with the Matawa First Nations to develop, promote and support a diverse private sector and entrepreneurial culture. It works to create 'opportunity-ready' communities and foster economic growth through economic and business development. It assists Matawa First Nations develop infrastructure, businesses and human capital to grow local economies. It also works with Matawa First Nation community development corporations to build capacity and develop projects and business opportunities to become more self-sufficient" (Matawa First Nations, no date).

Member nations of Matawa Economic Development include:

- Webequie First Nation
- Nibinamik First Nation
- Neskantaga First Nation
- Marten Falls First Nation
- Long Lake #58 First Nation
- Ginoogaming First Natio
- Eabametoong First Nation
- Constance Lake First Nation
- Aroland First Nation

Marten Falls and Webequie Workforce Development Strategy

The Ontario Ministry of Labour, Immigration, Training and Skills Development is providing funding to enable the First Nations to (North Superior Workforce Planning Board, no date):

- Develop of a comprehensive workforce development strategy that outlines the diversity of employment readiness and training pathways needed to help prepare community members for potential future employment opportunities.
- Develop priority recommendations to guide implementation decisions, budgets, and next step funding proposals, to advance Indigenous participation in the construction and operations of the proposed three roads in the Ring of Fire, together with other community projects that are planned.

- Build community capacity related to workforce development by leveraging community-based workforce developer trainee positions for each of Marten Falls First Nation and Webequie First Nation. These trainees will be provided with coaching and mentorship to help in their responsibilities as community workforce activists to help excite members in their own employment readiness and skills development objectives.

The North Superior Workforce Planning Board is providing subject matter expertise, project management assistance, and financial accountability stewardship, while the Ministry of Energy and Mines is facilitating relationship development and assisting with advancing project objectives. Additional community training partners may be engaged to provide input to the workforce development strategy.

Community Development Agreement

The Ontario government, Marten Falls First Nation, and Webequie First Nation have signed the Community Development Agreement to develop community infrastructure projects that could support future development opportunities in the area, including building all-seasons roads to the mineral-rich Ring of Fire region. The agreement, signed during a ceremony on March 5, 2024, commits the province to supporting shovel-ready infrastructure projects. Those could include construction of health and training facilities, recreation centres, commercial buildings and labour force development programs. These projects would help improve the well-being and readiness of the First Nations to participate fully in the construction of road projects that would connect the Ring of Fire critical mineral deposits with manufacturing hubs in the south.

> “As we move forward to now begin to consider road construction and operations, our commitment remains to be strong stewards of our lands and our environment, in balance with being active partners in growing economic opportunities and benefits for both our communities and other First Nation communities,” — **Chief Bruce Achneepineskum, Marten Falls First Nation**

> “Being at the table in the planning and implementation of road development is key to building a foundation for our future, a future that reflects our community vision, well-being and prosperity.” — **Chief Cornelius Wabasse, Webequie First Nation**

Marten Falls First Nation and Webequie First Nation are working together to accelerate project timelines and enable the communities to be ready to participate in future economic development opportunities in the region. This collaboration is focused on enhancing the communities’ well-being and livelihoods, including an emphasis on long-term sustainability to protect the land and the people’s future.

Together, the Community Access Road, Webequie Supply Road, and Northern Road Link would connect these two First Nation communities to the Ontario highway network and provide access to the mineral deposits in the Ring of Fire. Economic development in the Ring of Fire area will create opportunities to share economic benefits and support the long-term prosperity of Marten Falls First Nation and Webequie First Nation (Government of Ontario, 2024b).

Regional Assessment in the Ring of Fire Area

The regional assessment will be conducted in the area centred on the Ring of Fire mineral deposits in Northern Ontario (540 kilometres northeast of Thunder Bay). The regional assessment aims to gather information and data on the region; understand potential effects from past, existing and future development in the Ring of Fire area; and will inform and improve future impact assessments. Indigenous partners and the Impact Assessment Agency of Canada are co-leading the regional assessment and will provide Indigenous communities and organizations, federal and provincial governments, non-government organizations and the public opportunities to meaningfully participate.

Indigenous partners include: Aroland First Nation, Attawapiskat First Nation, Constance Lake First Nation, Eabametoong First Nation, Fort Albany First Nation, Ginoogaming First Nation, Kashechewan First Nation, Long Lake #58 First Nation, Marten Falls First Nation, Missanabie Cree First Nation, Moose Cree First Nation, Neskantaga First Nation, Nibinamik First Nation, Webequie First Nation, and Weenusk First Nation. Administrative support is provided by the Matawa and Mushkegowuk Councils.

On January 20, 2025, it was announced that First Nation partners and the Impact Assessment Agency of Canada have finalized the terms of reference to guide the Regional Assessment in the Ring of Fire Area (Government of Canada, 2025c).

8.3.8.2.4 Public Safety

8.3.8.2.4.1 Greenstone Municipality

Crime severity within the Greenstone Municipality must be considered in the context of its location within the Central Region of the Nishnawbe Aski Police Service. While crime statistics are reported at the police service level rather than at the municipal level, these figures provide an overview of crime severity within the broader jurisdiction that includes Greenstone.

The overall Crime Severity Index for the Nishnawbe Aski Police Service was substantially higher than the provincial average for Ontario throughout the 2021 to 2023 period. In 2021, the Nishnawbe Aski Police Service Crime Severity Index was 297, compared to

Ontario's Crime Severity Index of 56, representing a level approximately 5.3 times higher than the provincial average. In 2022, the Crime Severity Index for Nishnawbe Aski Police Service declined slightly to 292, while Ontario's Crime Severity Index increased to 59, maintaining a ratio of approximately 4.9 times the provincial level. In 2023, the Nishnawbe Aski Police Service Crime Severity Index increased to 302, compared to Ontario's Crime Severity Index of 61, corresponding to a ratio of approximately 5.0. Over the same period, the Canadian Crime Severity Index ranged from 75 to 80, indicating that crime severity within the Nishnawbe Aski Police Service jurisdiction also exceeded national averages (Canada Crime Report, 2023; Nishnawbe Aski Police Service, 2024).

8.3.8.2.4.2 Thunder Bay

The City of Thunder Bay consistently records higher Crime Severity Index values than the provincial average for Ontario. Between 2021 and 2023, Thunder Bay's overall Crime Severity Index ranged from 103 to 108, while Ontario's Crime Severity Index over the same period ranged from 56 to 61. This places Thunder Bay's Crime Severity Index at approximately 1.7 to 1.9 times the Ontario average across the three-year period. When compared to the national context, Thunder Bay's Crime Severity Index also exceeds the Canadian average, which ranged from 75 to 80 during the same timeframe.

Violent crime indicators show a more pronounced difference. Thunder Bay's Violent Crime Severity Index increased from 177 in 2021 to a peak of 213 in 2022, before declining to 192 in 2023. In contrast, Ontario's Violent Crime Severity Index remained comparatively stable, ranging from 72 to 79 over the 3 years. As a result, Thunder Bay's violent crime severity levels were approximately 2.4 to 2.7 times higher than the provincial average. Relative to Canada as a whole, where the Violent Crime Severity Index ranged from 93 to 99, Thunder Bay also exhibited notably higher values throughout the period (Canada Crime Report, 2023; Nishnawbe Aski Police Service, 2024).

8.3.9 Land and Resource Use

This section provides a description of existing environmental conditions for land and resource use. The existing land and resource use conditions are described within the Construction Disturbance Area, Local Study Area, and Regional Study Area.

Data for the land and resource use existing conditions assessment was collected between October 2021 and June 2025 and included reviewing public data sources and Indigenous Knowledge. Indigenous and non-Indigenous community members provided input to support the preparation of mitigation and monitoring plans related to the Community Access Road. It should be noted that this section does not go into detail describing traditional and Indigenous land use activities within the study area but

generalizes uses by Indigenous communities and its members. Individual reports for Indigenous communities have been prepared regarding the Indigenous use of land and resources for traditional purposes (Marten Falls First Nation Aboriginal and Treaty Rights and Interests: Preliminary Existing Conditions Report; Marten Falls First Nation, 2023).

The complete description of land and resource use existing conditions is documented in the Land and Resource Use Technical Support Document (**Appendix U**).

8.3.9.1 Land Use Compatibility

Land use compatibility considers the compatibility of the Community Access Road with existing land uses, including federal, provincial, and Indigenous planned and present uses. Land use compatibility was reviewed to include the existing policies, procedures, guidelines and legislation that govern the management of the area.

The area surrounding the Community Access Road remains largely natural, consisting of boreal forest and muskeg. Main land uses in the vicinity, excluding traditional land uses, include mineral exploration, forestry at the southern end, and various recreational activities such as hunting, fishing, and canoe tripping.

Land uses in the Local and Regional Study Areas were identified using several sources, including the Mining Land Administration System, the Crown Land Use Policy Atlas, provincial legislation, and planning documents such as the Ogoki Forest Management Plan (2020–2030). The legislation that governs the use of land and resources on public lands managed by the Ontario government in the Far North includes; *Public Lands Act*, *Mining Act*, *Northern Ontario Heritage Fund Act*, *Ministry of Energy Act*, *Crown Forest Sustainability Act*, and *Provincial Parks and Conservation Reserves Act*. Management of Provincial Public lands does not include federal lands or private (fee simple) lands (as there are limited private or fee simple lands in this part of the province). The *Far North Act* and *Public Lands Act* are governed by the Minister of Natural Resources. The *Northern Ontario Heritage Fund Act* is governed by the Minister of Northern Economic Development and Growth. The *Mining Act* is governed by the Minister of Mines. Although the *Far North Act* aids in land use planning for the area as defined as the Far North, pre-existing legislation and policies governed land and resource use prior to the enactment.

The land use compatibility Regional Study Area falls under several governing jurisdictions, with the majority of the land in this area being managed under the *Far North Act*, which was enacted in 2010. This provides a joint planning process between First Nations and the province through the development of a Community Base Land Use Plan. The purpose of the joint planning process is to identify and protect culturally significant areas within First Nations traditional territories, this includes protection for lands that are traditionally use for hunting, fishing and harvesting. Individual communities can work with

the Ministry of Natural Resources to develop a Community Base Land Use Plan which would identify lands used for planning. Although the *Far North Act* aids in land use planning for the area as defined as the Far North, pre-existing legislation and policies governed land and resource use prior to the enactment. The legislation that governs the use of land and resources on public lands managed by the Ontario government in the Far North also includes; *Public Lands Act*, *Mining Act*, *Northern Ontario Heritage Fund Act*, *Ministry of Energy Act*, *Crown Forest Sustainability Act*, and *Provincial Parks and Conservation Reserves Act*. Management of Provincial Public lands does not include federal lands or private (fee simple) lands (as there are limited private or fee simple lands in this part of the province). These legislations overlap and compliment each other.

Provincial Crown land is managed through a framework of policies, procedures, and land use designations that permit or restrict specific activities. The Crown Land Use Policy Atlas identifies permitted uses and provides direction for future development in Crown land areas (enhanced management or general use areas) within the Ministry of Natural Resources Districts, Community-Based Land Use Plan, and lands registered under the *Mining Act*.

In the Regional Study Area, existing Crown Land Policy and the direction provided in the Final Community-Based Land Use Plans form the primary framework for understating current and future land use. These planning tools identify permitted and restricted activities, areas designated for protection and lands intended for potential development and therefore provide essential context for evaluating how the proposed road may influence land management.

Within the Regional Study Area, the Official Plan for the Municipality of Greenstone applies to a portion of the area (Municipality of Greenstone, 2022). The Municipality of Greenstone contains the communities of Beardmore, Geraldton, and Nakina, which are approximately 50 kilometres or more away from the southernmost point of the Construction Disturbance Area, and 230 kilometres away from Marten Falls. The Official Plan contains policies to guide residential, commercial, industrial, parks and open space, natural resource, hazard land, and utilities development (Municipality of Greenstone, 2022).

The legislative and policy framework described for the Regional Study Area, including the *Public Lands Act*, *Far North Act*, *Provincial Parks and Conservation Reserves Act,* and the Crown Land Use Policy Atlas, also applies to the Local Study Area. Areas managed under the *Public Lands Act* include the existing Painter Lake Road and Ogoki Forest Boundary which also represents the Ministry of Natural Resources District Boundary. The *Far North Act* which encompasses the remaining portions of the proposed road with the exception of the portion that crosses through the Albany River Provincial Park which is managed under the *Provincial Parks and Conservation Reserves Act.*

Public Land use considerations for most of this area are identified with the Crown Land Use Policy Atlas. The area around the Painter Lake Road fall within Geraldton General Use Area (G2697) which identifies permitted land uses such as aggregate extraction, bait fishing, commercial fishing, fur harvesting, road development and maintenance.

The portion of the proposed road that falls within the Far North is subject to the land use direction established under the *Far North Act.* Land use in this area will ultimately be guided by Community-Based Land Use Plans that are jointly prepared by the Province and Indigenous Communities; however currently this area only contains one Draft Community-Based Land Use Plan for Marten Falls First Nation. Until the final plan is approved, land use in these areas remains under the authority of the Ministry of Natural Resources.

The Municipality of Greenstone has its own land use planning structure under its Official Plan and designates: Settlement Areas, residential commercial and industrial districts, environmental protection areas, agriculture, peat extraction, forestry, public service facilities, communication facilities, airport district, cemeteries, and energy systems. The Community Access Road is not located within the Official Plan boundaries. As such, there is no anticipated conflict between the Municipality of Greenstone Official Plan land use designations and the Community Access Road.

8.3.9.2 Indigenous Land Use Planning

The *Far North Act's* purpose was to establish joint planning between the Province and Indigenous Communities within the area known as the Far North. Community-Based Land Use Plans establish areas where lands can be protected and other areas where lands can be developed. There is one Draft Community-Based Land Use Plan for the area encompassing the Local Study Area. Given that this is still in draft format, planning between the communities and Ministry of Natural Resources is ongoing. The purpose of a Community Base Land Use Plan is for:

- Supporting long-term benefits to the First Nation communities within and beyond the planning area as well as enabling economic development opportunities; and
- Support multiple access interests while minimizing the number and spatial extent of roads and other infrastructure corridors (Ministry of Natural Resources and Forestry, 2015b).

8.3.9.2.1 Marten Falls Draft Community-Based Land Use Plan

The Community Access Road falls within lands identified in the Draft Marten Falls First Nation Community-Based Land Use Plan (Marten Falls First Nation, 2020). To support

the land and resource use assessment, the draft plan and its associated mapping were reviewed including the following:

- Resource-based tourism (camps);
- Planning area of interest;
- Areas of provincial interest;
- Land values;
- Forest land cover; and
- Proposed Development Protection Area.

Marten Falls First Nation has conveyed that alterations to the proposed Development Protection Area can still occur to address the preferred routing of the Project, given that there is overlap between the Project and the Development Protection Area.

At the time of writing the Final Environmental Assessment / Impact Statement, no other Indigenous Community-Based Land Use Plans within the Construction Disturbance Area were identified / available.

8.3.9.3 Parks and Protected Areas

Parks and protected areas that fall within the Local and Regional Study Area were regulated due to their natural, cultural, and recreational values. These areas include provincial parks, conservation reserves, areas of natural and scientific interest, and / or protected areas as determined by regional or local land use planning documents such as a Community-Based Land Use Plan.

Provincial parks and protected areas are established under provincial jurisdiction of the *Provincial Parks and Conservation Reserves Act* and their corresponding management statements (Government of Ontario, 2006). In addition, dedicated protected areas can be established jointly by Indigenous communities and the Ontario government. Provincial parks fulfill a variety of objectives and are regulated for their natural, cultural, and recreational values. Within the Project Study Area, there are provincially regulated parks and protected areas.

The parks and protected areas Regional Study Area overlaps five provincial parks and one Areas of Natural or Scientific Interest, which are outlined in **Table 8.3-38.** Other features such as Significant Ecological Areas and Old-Growth Forests are also located within some parks and protected areas within the Regional Study Area. Activities such as camping, hiking, fishing, hunting, canoeing / boating, swimming, and wildlife viewing take place in these provincial parks. Most protected areas have varying levels of

permitted activities depending on the purpose of protection of the park, conservation reserves, and Areas of Natural or Scientific Interest.

Table 8.3-38: Parks and Protected Area Features

Categories of Parks and Protected Area Feature	Feature	Area Transected by Construction Disturbance Area (hectares)
Provincial Parks	Albany River Provincial Park	5.7
	Little Current River Provincial Park	0
	Otoskwin-Attawapiskat River Provincial Park	0
	Nakina Moraine Provincial Park	0
	Ogoki River Provincial Park	0
Area of Natural and Scientific Interest	Jobes Creek	0

There are no national parks, municipal parks, federal or provincial conservation reserves, Non-Government Organization nature reserves, or Crown game preserves within the Regional Study Area.

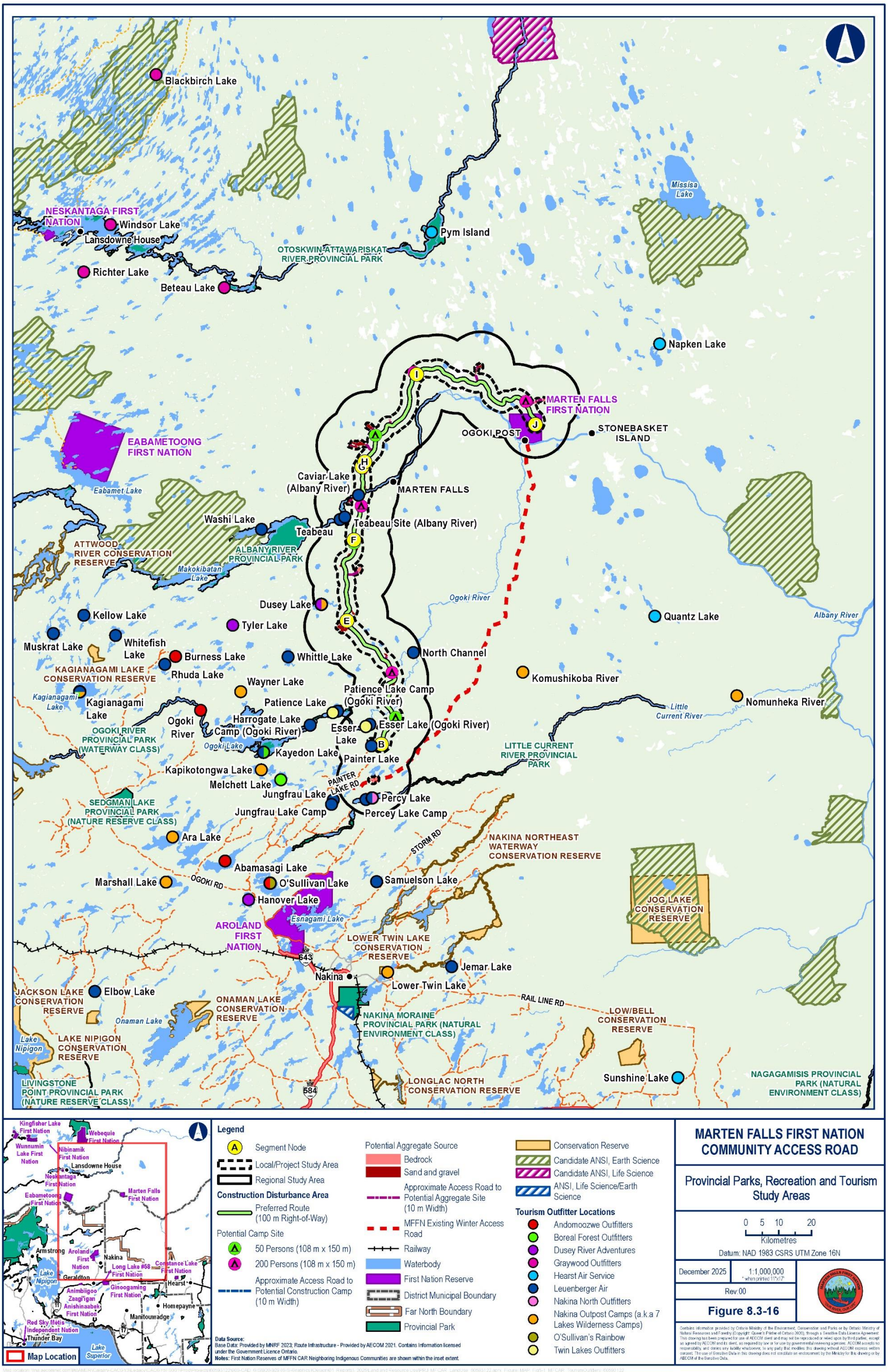
There is only one provincial park and protected area within the Local Study Area, the Albany River Provincial Park. The Preferred Route was selected to impact less parks and protected areas. Other features such as Significant Ecological Areas and designated Old-Growth Forests are also located within the parks and protected areas Regional Study Area.

Albany River is a remote waterway class park that is 91,500 hectares in size that was protected based on it's cultural and geological significance. Within the Local Study Area, the boundary of the park is defined as a 200-metre buffer on the north and south sides of the Albany River.

The Albany River Provincial Park is available for remote backcountry wilderness experiences and also contains 11 commercial outpost camps. Within the Albany River Provincial Park, there is a history of commercial fishing by Indigenous harvesters from Mishkeegogamang, Eabametoong, and Marten Falls First Nations. Two traplines cross into the park in proximity to the proposed route. The management and jurisdiction of these traplines rests with the Ministry of Natural Resources.

Table 8.3-38 details the parks and protected areas Local and Regional Study Areas. These areas can be seen on **Figure 8.3-16**.

Figure 8.3-16: Provincial Parks, Recreation and Tourism Study Areas



8.3.9.4 Recreation and Tourism

There are numerous opportunities in Northern Ontario for recreation and tourism, especially the remote wilderness experiences offered in the Far North. Since the area is currently only accessible by air or waterways, the Community Access Road would introduce a different experience for the recreation and tourism in the area.

In Northern Ontario, hunting and fishing are key components of the recreation and tourism economies. Regulated through the *Fish and Wildlife Conservation Act*, the Act regulates hunting and fishing, outlines licensing and safety requirements, and permits specific harvesting methods for hunters and anglers (Government of Ontario, 1997).

The recreation, tourism, and trapping within the Study Areas are subject to the policies of the *Fish and Wildlife Conservation Act* and the Ministry of Natural Resources regulates these activities through the wildlife management units, fisheries management zones, traplines, bear management areas and bait harvest areas.

Six Ministry of Natural Resources wildlife management units fall within the Regional Study Area (wildlife management units 1C, 1D, 17, 18A, 18B, and 25) and two wildlife management units fall within the Local Study Area (wildlife management units 1D and 17). For non-Indigenous hunters, each wildlife management unit requires licences and / or tags for the types of game that can be harvested, along with geographic and species based open season, and regulated hunting methods. The regulated hunting methods help to sustain wildlife populations. Authorized hunters (non-indigenous) must have appropriate firearms licensing and an outdoors card with appropriate tags and licences to legally harvest. Refer to **Section 8.2** for details on wildlife existing conditions within the Study Area.

Certain species are sought by licenced hunters and Indigenous peoples for this area. Species that are generally hunted within the Local Study Area include moose (Alces alces, mooz); bear (Ursus americanus, makwa); grouse (Ruffed (Bonasa, papashki), including spruce (Canachites canadensis, mijikozhe) and sharp-tailed (Tympanuchus phasianellus, ahgusk); waterfowl including geese (nikah) and ducks (shesheed); and snowshoe hare (Lepus americanus, abooze). Seasons for hunting varies depending on which wildlife management unit the game is being harvested from. Indigenous communities are able to harvest year-round and are not restricted to seasons. The description for each wild game is based on the resident and non-resident timing windows. Given that the majority of the resident and non-resident hunters are utilizing the remote tourism outfitters (commercial outpost camps) for this area, these descriptions indicate the dates and tag allocations that are for these wildlife

management units and are not specific for each remote tourism outfitter, nor is it representative of the number of animals harvested within the Local Study Area.

Three fisheries management zones (fisheries management zones 2, 3, and 7) fall within the Regional Study Area and two fall within the Local Study Area (fisheries management zone 2 and 3). The fisheries management zones contain established regulations similar to the wildlife management units, limiting fishing seasons to manage and protect species populations and adjusted after consistent population studies have shown sustainability of fisheries populations. Refer to **Section 8.1** for details on the fish species existing conditions within the study area.

In 2009, the Ministry of Tourism, Culture and Sport established 13 Regional Tourism Organizations across Ontario. These Regional Tourism Organizations monitor tourist activities across areas to create comparable tourism profiles. The Community Access Road falls within Regional Tourism Organizations 13c (northwest Ontario).

Currently, there are no recognized or maintained snowmobiling trails in the Local Study Area, but a representative of the Ontario Federation of Snowmobiling Clubs indicated (Ontario Federation of Snowmobiling Clubs, 2022, personal communication) that there has been discussion about opening up trails in the Local Study Area.

Recreational canoeing and kayaking activities occur in the Local Study Area, in particular on the Albany River, which is also a provincial park (Geraldton Area Natural Resources Advisory Committee, 2022, personal communication). The Albany River Provincial Park contains backcountry camping opportunities that would involve canoe camping at the various campsites located along the route as well as portage trails which occur around rapids along the Albany River. It should be noted that there are no campsites within the construction limits and portages are anticipated to be preserved if encountered.

The Recreation and Tourism Regional Study Area consists of the 5 kilometres buffer around the proposed route. This is a relatively remote area with limited road access which requires other methods of transportation such as boating or fly-in access to hunting and fishing opportunities. Apart from hunting and fishing, tourism and recreation activities in the Regional Study Area are largely outdoor related, including canoeing / kayaking, boating, snowmobiling, camping, hiking, and wildlife viewing (Geraldton Area Natural Resources Advisory Committee, 2022, personal communication). The area also includes recreational properties known as commercial outpost camps (fly-in remote and secondary road accessible) (Geraldton Area Natural Resources Advisory Committee, 2022, personal communication).

8.3.9.5 Remote Outfitters

As part of the northern economy, remote outfitters / operators for commercial outpost camps provide tourism opportunities in the remote wilderness by attracting clients through fishing and hunting exclusive packages which also provide lodging and guiding. The Community Access Road runs parallel to numerous commercial outpost camps and could impact the remote experience for operators and clients.

Commercial outpost camps are managed on Crown land by the Ministry of Natural Resources through Crown land management policy PL 4.06.01. These facilities are generally tenured by a Land Use Permit or Crown Lease. In this particular area, there are only Land Use Permit commercial outpost camps that are classified as “Type A” Land Use Permits which are fixed structures that are only accessible by air, water or forest trails / restricted access roads (Ministry of Natural Resources, 2022). Land Use Permits grant the rights of the permit holder to use Crown land for the specified purpose and authorizes the permit holder to have structures on the property. If changes or additions to the site are required, the permit holder must request an authorization from the Ministry of Natural Resources to make upgrades and it must remain in the 0.5 hectare site (as outlined through a site sketch) assigned to that Land Use Permit.

The Regional Study Area contains 13 remote outfitters that operate commercial outpost camps for hunting and fishing excursions. These establishments each employ minimal staff to guide and accommodate guests. These camps are often supported by small air transportation firms within the region which provide access to remote areas where hunting and fishing can occur in a private / remote experience. Some of these remote locations contain boat caches which allow the outfitter to fly in guests for day fishing excursions. As part of the Marten Falls First Nation Draft Community-Based Land Use Plan (Marten Falls First Nation, 2020), resource-based tourism is an expressed interest for the community to provide economic growth and development in the area. Other communities have also expressed interest in recreation and tourism values.

Within the Local Study Area, the most popular type of recreation and tourism activities are offered by remote tourism outfitters for fly-in / fly-out hunting and fishing expeditions at lodges and outpost camps.

There are six remote tourism outfitter operations that were identified within closer proximity to the proposed route, with one camp being roughly 1.7 kilometres from a proposed bridge crossing along the Albany River. Engagement with 12 tourism outfitter operators occurred to determine the type of services provided, the location of lodges and outpost camps, and the concerns of tourism outfitter business owners. **Figure 8.3-16** shows the location of tourism operators’ main base lodges and outpost camps

within the Construction Disturbance Area, as self-reported through interviews and on business websites.

Tourism outfitters operate between mid to late May and late October, shifting their service offerings throughout the season to align with the number of tags for game that are available and open season for fish species during that time.

Aside from customers who use the services of remote outfitters, areas in the southern limits of the road (Painter Lake Road) are used by local hunters in the Greenstone area. It is also assumed that some of the lakes are accessed by individuals with access to float planes.

8.3.9.6 Trapping

The majority of traplines in the Regional Study Area and Local Study Area are held and used by members of Indigenous First Nations.

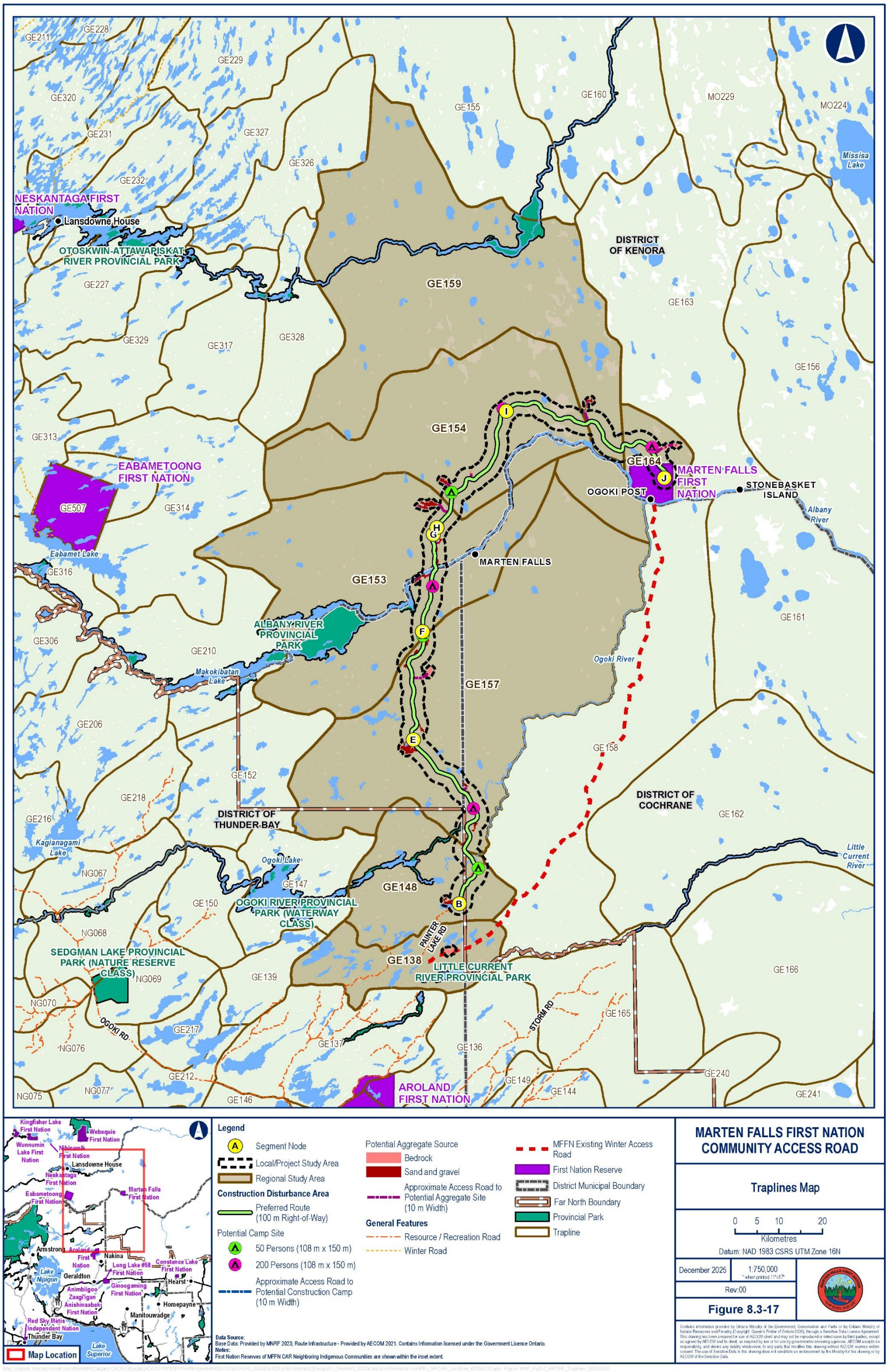
Trapping in Ontario is subjected to the policies, guidelines (regulations) and rules under the *Fish and Wildlife Conservation Act*. The province is divided into traplines or areas that are managed by a head trapper. There are requirements for licensing that allow them harvest within the limits of their trapline. They also have the right to hire helper trappers that also require a trapping licence and permission to harvest within the head trappers trapline. Trapping of species occurs at different times of the year but generally occurs from late fall to late winter.

Trapping is described as a way of life for many Indigenous communities, with families trapping for approximately 3 months at a time. Historically, trapping was a family endeavour and was used as a food source, for furs to line clothes / blankets, and for medicines. Trapping is less common now as prices for furs have declined and costs associated with trapping (such as, gasoline for snowmobiles) have increased. Trapping is now largely recognized as a pastime and a way to preserve Indigenous culture and not a commercial activity. In 2025, fur prices have increased significantly, potentially indicating a viable future economic development for this area (Fur Harvesters Auction Inc, 2025).

During Indigenous community engagement two responses related to traplines from Aroland First Nation and Ginoogaming First Nation were received. Aroland First Nation indicated that five of their traplines intersect with the Regional Study Area.

There are seven traplines that intersect the centreline of the proposed route for the Community Access Road, while ten traplines intersect the Local Study Area that is identified in **Figure 8.3-17**. All the head trappers in the Local Study Area are understood to be Indigenous.

Figure 8.3-17: Traplines Map



Aroland First Nation provided information via their Indigenous Knowledge and Land Use Study for the Community Access Road and indicated that their commercial trapping areas intersect with 47.4 kilometres of the Preferred Route. Aroland First Nation's commercial trapping areas overlap 1,651 hectares of the Local Study Area.

Ginoogaming First Nation identified four traplines within the Project study areas significant to members of Ginoogaming First Nation: GE 210, GE 138, GE 150, and GE 153. GE 138 and GE 153 overlap with the Construction Disturbance Area.

Additionally, 13 commercial harvesting sites areas were noted by 9 participants, are present within the Local Study Area, which cover a large geographic area and extend about 30 kilometres on either side of the Albany River. Participants also noted that their traplines have been underutilized in the past 10 years for commercial use due to the decline in prices and demand for furs.

Figure 8.3-17 shows the location of traplines intersecting the Local Study Area.

8.3.9.7 Extractive Resource Industry

The *Mining Act* regulates mining, prospecting, mineral exploration, mine development, and rehabilitation in the province. The Ministry of Mines is responsible for the administration of the *Mining Act*. The Act encourages prospecting, staking, and exploration for the development of mineral resources, particularly in a manner consistent with the recognition and affirmation of existing Aboriginal and Treaty Rights. This includes the duty to consult and alignment with other legislation (and regulations) under the *Environmental Protection Act, Environmental Assessment Act,* and *Ontario Water Resources Act* to minimize the effects of these activities on public health and safety and the environment (Government of Ontario, 1990).

At the time of drafting the Final Environmental Assessment / Impact Statement there are 36 active mining operations in the province that cover a diverse set of metals and minerals, including precious and base metals, and non-metallic minerals. Ten of these mines produce critical minerals, including cobalt, copper, indium, nickel, platinum group elements, selenium, tellurium, and zinc (Ministry of Energy and Mines, 2026).

Aggregate extraction is considered one of the most economically beneficial natural resource in Ontario. The use of aggregates for development of roads and infrastructure for communities is crucial for the economic growth of the province. The *Aggregate Resources Act, 1990* (2021 update) regulates aggregate operations on Crown and private land within the province and requires operations to follow site-specific plans for the extraction of aggregate resources within a specified boundary. The pits must be

maintained in a safe condition and have areas rehabilitated to minimize adverse effects on the surrounding environment. The Act provides guidelines for the management of aggregate areas and requires a license to be obtained from the Ministry of Natural Resources before undertaking aggregate extraction processes. The Minister reserves the right to determine whether appropriate consultation with Indigenous communities was undertaken prior to issuing licenses or permits (Government of Ontario, 2021).

There are several mining projects currently underway in northwest Ontario. This area is known for its variety and abundant mineral resources, including gold, silver, diamonds, nickel, palladium, and chromite (Corporation of the City of Thunder Bay, no date).

There is one operating mine in the Regional Study Area located in Geraldton, the Greenstone Gold Mine that is closest to the proposed route. The Community Access Road will provide access for future mining operations, such as Eagle's Nest Mine (within the Ring of Fire) which is proposed to extract nickel, copper, platinum and palladium minerals.

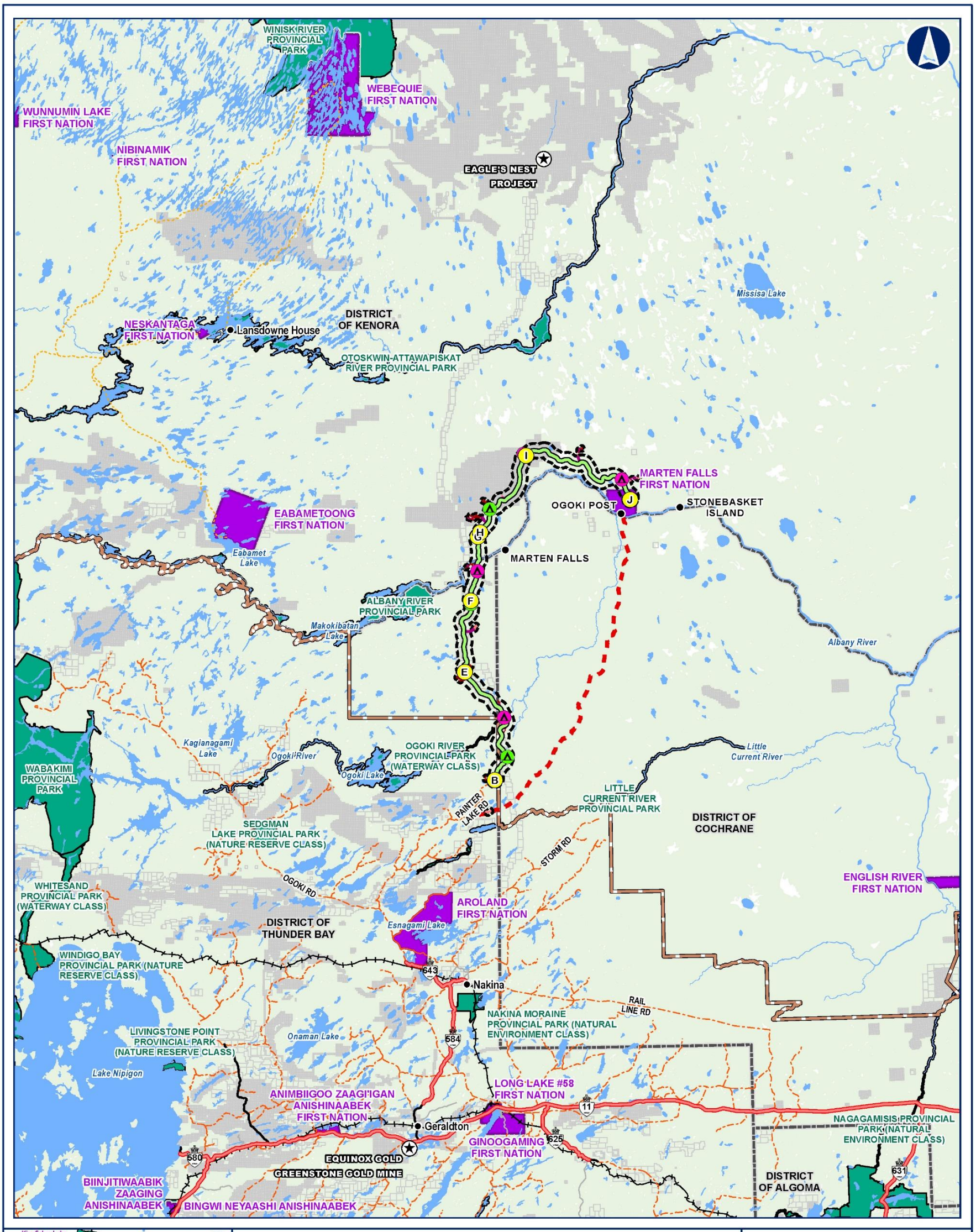
The Greenstone Gold Mine is located in the southern extent of the Local Study Area, and is owned by Equinox Gold (Ministry of Energy and Mines, 2026). Located in the Geraldton-Beardmore Greenstone Belt in Ontario, Canada, the properties are made up of several claim groups having a cumulative strike length of more than 105 kilometres along the district's most prospective geological structures. The properties have excellent access to infrastructure, including the Trans-Canada Highway (Canada's national highway) and the TC Energy's natural gas pipeline, which extends along its length.

The Greenstone mine property is located approximately 275 kilometres northeast of the City of Thunder Bay, Ontario and approximately 4 kilometres south of the Town of Geraldton, Ontario, at the intersection of Provincial Highway 584 and Trans-Canada Highway 11's current location (**Figure 8.3-18**). Highway 11 is being realigned to support the Community Access Road development and operation.

The Greenstone mine encompasses the former Hardrock, MacLeod-Cockshutt, and Mosher underground mines which operated from the late 1930s until about 1970 and together produced more than 2 million ounces of gold. Site rehabilitation work was undertaken during the 1990s. Greenstone Gold Mines proposes to mine the Hardrock deposit as an open pit over a Life of Mine of approximately 15 years (Ministry of Energy and Mines, 2026). The Greenstone Gold Mines project website describes the mine timeline as follows:

- Construction: Years 1 to 3, with ore stockpiling commencing after the first year of construction;
- Operation: Years 3 to 18, with Year 3 representing a transition from construction to operation; and
- Closure: Years 19 to 23 for Active Closure and Years 24 to 39 for post-closure.

Figure 8.3-18: Mineral Exploration Projects in the Regional Study Area



Project infrastructure will include a process plant operating 365 days per year and a mill with throughput averaging 27,000 tonnes per day (Ministry of Energy and Mines, 2026).

Of particular interest is the Ring of Fire – a mining development north of Thunder Bay said to hold some of the richest minerals in Canada including the largest chromite deposit in North America (Corporation of the City of Thunder Bay, no date). Exploration activity is underway in the Ring of Fire. As of November 2022, there are 26,167 active mining claims held by 15 companies and individuals, covering approximately 4,972 square kilometres (Government of Ontario, 2022). Minerals found in the Ring of Fire to date include chromite, copper, zinc, gold, diamond, nickel, and platinum group elements (Ministry of Energy and Mines, 2022). Kristan Straub, CEO of Ring of Fire Metals, a subsidiary of Wyloo Metals and owner of Eagle's Nest mining claims, has stated that the company's latest estimation about the valuation of minerals in the region comes in at around $90 billion (Turner, 2023).

The Ring of Fire will require all-season road access to transport equipment, staff, and ore. While it is anticipated that a portion of the Community Access Road may be used to transport ore from Ring of Fire mining operations to processing facilities elsewhere in Ontario, this is not the primary purpose of the road. The Community Access Road is intended to improve access, foster economic development, and enhance the overall quality of life for Marten Falls First Nation members. Although the road is often linked to broader regional initiatives such as the Ring of Fire, Marten Falls First Nation emphasizes that this Environmental Assessment / Impact Assessment process is focused solely on advancing the Community Access Road itself—an infrastructure project the community has been advocating for nearly four decades.

Additional mining activity in the Regional Study Area and Local Study Area is being conducted by KWG Resources. A representative of KWG indicated that the company has staked a line of claims (minus some minor gaps) along the esker, sand ridges, and sand bars that run up toward the Ring of Fire. KWG Resources has spent $20 to $30 million to collect existing conditions information and to create a database on the claims (geological, geophysical, and geochemical), flew LiDAR, and contracted a rail group for a construction design engineering feasibility study. While KWG's claims are not within the Community Access Road Local Study Area, the representative indicated that the development of the Community Access Road will support their mining activity by providing greater road access to their site to the north of the Project.

Extraction exploration activities in the Local Study Area include exploration of claims held by Wabassi Resources approximately 700 square kilometres in area and located outside of the Ring of Fire.

Figure 8.3-18 shows the current mineral exploration activities within the Reginal Study Area.

8.3.9.8 Forest Industry

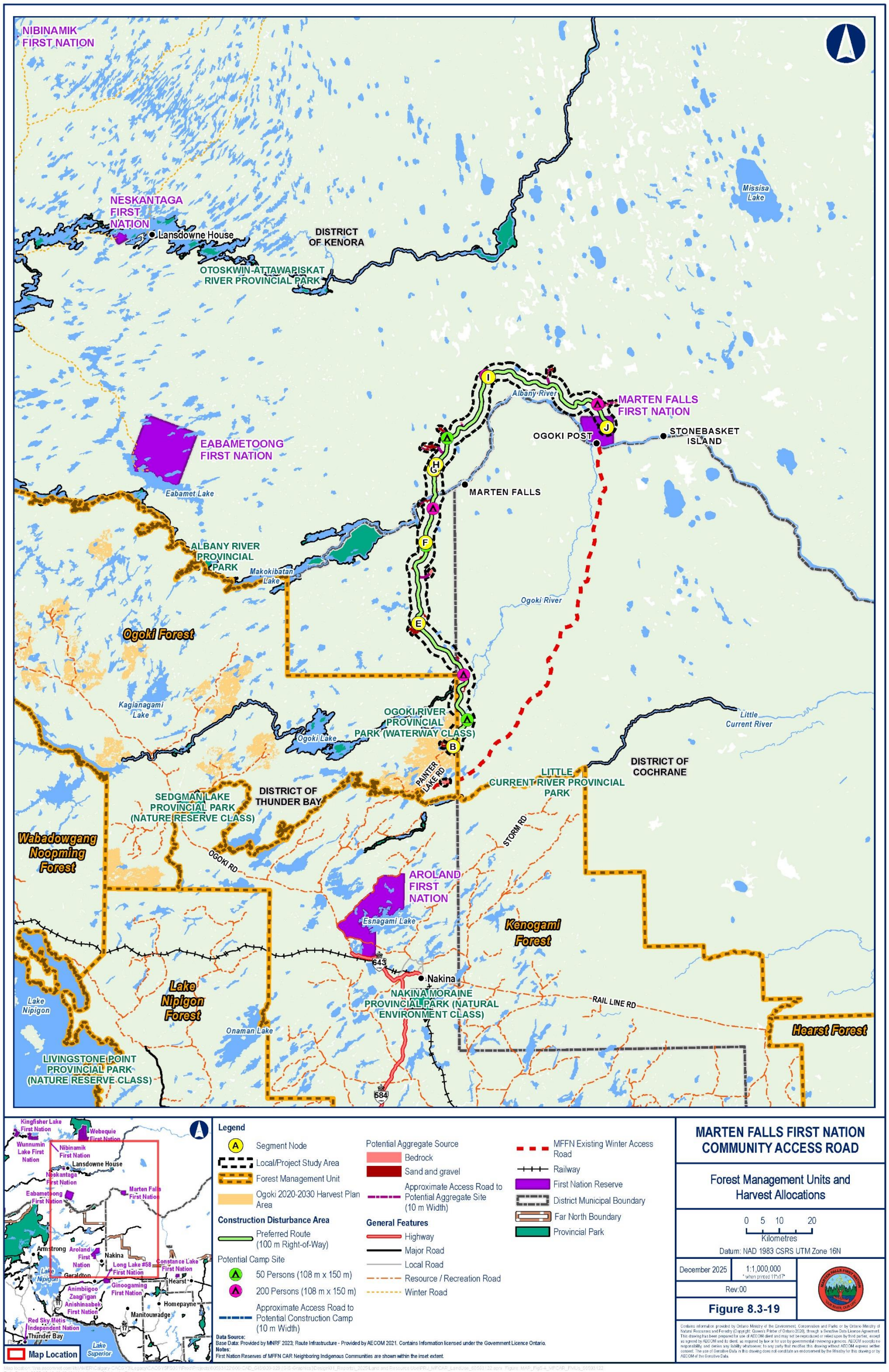
The *Crown Forest Sustainability Act, 1994* (Government of Ontario, 1994) governs forest management and associated activities for the Province of Ontario and is managed by the Ministry of Natural Resources. The Forest Management Planning Manual, a manual regulated under the *Crown Forest Sustainability Act*, provides guidance on how to develop Forest Management Plans for Sustainable Forest Licence holders in Ontario (Government of Ontario, 1994). Under Forest Management Plans, Environmental Assessment requirements are met under Declaration Order MNR-75 – Environmental Assessment Requirements for Forest Management on Crown Lands in Ontario. The Declaration Order establishes the geographic area of Environmental Assessment coverage, the "Area of the Undertaking" – this represents 44 percent of Ontario's Crown forests, divided in Forest Management Units. The Forest Management Units are managed under licensing agreements and plans for Forest Management Units are approved and administrated on a ten-year basis by the Ministry of Natural Resources. The plans outline the location of harvesting, types of species, amounts and where proposed roads will be built. Other factors that are considered are identified such as distance from waterbodies, leaving residual stands for natural reforestation and areas of concern. Other factors considered are silvicultural practices such as scarification of the land for future tree planting operations.

The Environmental Registry of Ontario gathered feedback on the 2020 to 2030 Draft Forest Management Plan for the Ogoki Forest with the feedback window closing on January 4, 2021. As of March 15, 2021, the 2020 to 2030 Forest Management Plan for the Ogoki Forest has been approved by the Ministry's Regional Director and is available for inspection.

The Kenagami and Ogoki Forest Management Plans fall within the Regional Study Area. The Kenagami Forest is scheduled for an updated Forest Management Plan in 2031, and the Ogoki Forest is scheduled for an updated Forest Management Plan in 2030. Currently, both forests have active harvesting and silvicultural operations. However, representatives for the forestry companies have observed that the forests have been following provincial trends of declining productivity.

The Ogoki Forest falls within a portion of the Local Study Area. The Ogoki Forest is bordered to the north and east by the northern boundary of the Community Access Road (**Figure 8.3-19**) and to the west by Wabakimi Provincial Park. Painter Lake Road, which is to be used to access the Community Access Road, is considered the primary forest road that is used by forestry companies to access harvest blocks. At the time of authoring, the Project Team is not aware of interest in a Forest Management Unit for the Far North Area that encompasses the Local Study Area of the proposed route. It is up to the discretion of the Ministry of Natural Resources to open future Forest Management Units.

Figure 8.3-19: Forest Management Units and Harvest Allocations



The Ogoki Forest has rugged uplands and lowlands, and has many different types of trees like spruce, pine, fir, and poplar (Agoke Development Corporation, no date). The Ogoki Forest is managed by the Agoke Development Corporation, a First Nations-led resource development business led by Aroland First Nation, Eabametoong First Nation, and Marten Falls First Nation. Agoke seeks out community input from land users, trappers, and community members to identify areas of concern, cultural values, and other sensitive areas to be protected (Agoke Development Corporation, no date). Since 2015, under provincial license, Agoke Development Corporation has been harvesting fibre currently moving to the Longlac Lumber Inc. sawmill.

The Ogoki Forest Management Plan is currently under review and is expected to be completed by 2024, with a planning and management horizon to 2030.

8.3.9.9 Energy and Linear Industry

Electricity projects in Ontario are regulated under the Province's *Electricity Act, 1998* (Government of Ontario, 1998). The Act regulates independent electricity system operators in the planning, procurement, and pricing of electricity. Transmissions and distribution systems through electricity markets are also regulated. Additionally, reliability standards, emergency planning, and property interests specifically around electricity infrastructure are addressed by the Act.

The *Oil, Gas, and Salt Resource Act* regulates natural gas pipelines and the *Technical Standards and Safety Act, 2000* regulates the licensing and use of oil and gas pipelines, license applications, and the use of oil and gas pipelines (Government of Ontario, 1990); (Government of Ontario, 2000).

The Ontario Energy Board is an independent energy regulator that regulates, licenses, and oversees the province's electricity and natural gas sectors (Ontario Energy Board, 2008). The Independent Electricity System Operator is the Crown Corporation responsible for operating the electricity market of Ontario (Independent Electricity System Operator, 2014). The Ontario Energy Board receives its powers from the *Ontario Energy Board Act, 1998*, while the Independent Electricity System Operator receives powers from the *Electricity Act, 1998*, both working to confirm current and future electricity needs of the province are met.

Chapter 7 of the 2017 Long-Term Energy Plan: Delivering fairness and choice includes a goal of supporting off-grid First Nation communities, as 25 remote First Nation communities in the province's northwest rely on diesel fuel to power their communities, including Marten Falls First Nation (Government of Ontario, 2017). Marten Falls has

been listed in the plan as a remote community that could be connected to the provincial power gird through future proposals.

For this Environmental Assessment / Impact Statement, energy and linear infrastructure refers to electricity infrastructure (such as generation stations, hydroelectric infrastructure, and transmission lines) and natural gas infrastructure (such as pipelines and extraction sites). It has been assumed that with the development and extension of electricity infrastructure, that other utilities such as telephone or internet would utilize linear infrastructure once it has been established.

The Independent Electricity System Operator has developed the 2014 Remote Community Connection Plan to connect 21 remote communities to the provincial electric network. Currently, Wataynikaneyap Power is the transmitter for power to 16 of the communities and development work and approvals are underway to provide a service date of 2023 (Independent Electricity System Operator, 2021). Work to source a provider and transmitter for the remaining five communities is also ongoing, although there is currently no plan to connect to Marten Falls as part of this work. However, the Wataynikaneyap Power project shows an increase in interest to extend energy infrastructure to the north to connect remote Indigenous communities and to provide the required servicing for future mining extraction operations in the Far North (in other words, the Ring of Fire).

At this time, there are no energy and linear infrastructure facilities or projects in development in the Construction Disturbance Area.

8.3.10 Visual Environment

Data for the visual environment description of existing conditions was collected from October 2021 to September 2024. The visual environment is characterized by an expansive, largely undisturbed boreal and sub-boreal wilderness landscape typical of the James Bay Lowlands of Northern Ontario. The region exhibits minimal permanent human development, resulting in a landscape dominated by natural landforms, extensive forest cover, wetlands, and interconnected river systems. Visual conditions are strongly influenced by scale, openness, and remoteness, with long viewing distances occurring primarily along major river corridors and limited visibility elsewhere due to dense vegetation and flat to gently undulating terrain.

Anthropogenic features are currently sparse and generally limited to seasonal winter roads, informal trails, remote cabins, and land use features associated with traditional harvesting and recreation. As a result, the existing conditions visual environment is defined by high scenic integrity, low visual clutter, and an absence of linear infrastructure or permanent crossings in most areas.

Water features are visually prominent elements in the existing environment. Major rivers such as the Albany and Ogoki rivers create wide, open corridors that allow for extended views and form dominant visual axes across the landscape. These waterways:

- Serve as natural travel routes and gathering places;
- Provide contrasts in colour, texture, and light relative to surrounding forests;
- Are focal points for visual experience, particularly for Indigenous land users, recreationists, and park visitors; and
- Smaller rivers and streams generally present more constrained views, particularly where forested banks limit visibility.

From an Indigenous perspective, the visual environment is inseparable from cultural identity, land-based practices, and spiritual relationships with the landscape. Existing conditions are characterized by:

- Intact natural views along culturally important waterways, travel routes, harvesting areas, and traditional use sites;
- A strong sense of remoteness and quietness; and
- Minimal evidence of modern infrastructure, reinforcing continuity of cultural landscapes and traditional land use.

Kashechewan, Marten Falls, and Aroland Indigenous Knowledge holders emphasized that visual quality is not limited to scenic aesthetics but includes the ability to experience the land as spiritually meaningful, and enables a sense of place. Even small or localized visual intrusions are considered notable due to the mostly pristine condition of the landscape.

Recreation and tourism experiences in the Study Area rely heavily on expectations of wilderness character. Visual experiences are generally transient but highly valued, with scenic quality and absence of development forming a core part of the recreational appeal.

Within Albany River Provincial Park and Ogoki River Provincial Park, the visual environment reflects formal management objectives aimed at preserving wilderness aesthetics.

The existing visual environment is considered to have high sensitivity to change. This sensitivity reflects: The pristine existing conditions of the landscape; Cultural, recreational, and ecological importance of natural views; strong expectations for wilderness character, remoteness, and visual continuity.

9. How the Road will Change Our Land

Section 6.7 describes how the residual effects assessment will be completed. This process required the technical disciplines to review the existing conditions information provided in **Section 8** and to review the results of the Preferred Route described in **Section 4**. Using both of these pieces, the technical disciplines moved forward with assessing the effects for the **Preferred Route**.

To complete the below sections, each discipline identified the effects which may occur as a result of the Community Access Road and the associated activities. This included considering where effects may indirectly occur, such as changes in vegetation which may indirectly affect wildlife. After the effects were identified mitigation measures were developed, and the residual effects were determined. Residual effects are those effects that remain after all the mitigation measures are implemented.

It is important to highlight some of the positive effects of the Community Access Road, which include improved accessibility to and from Marten Falls First Nation, leading to small increases in on-reserve population, positive effects on productivity and economic growth, and sustained tax revenues. The construction of a permanent Community Access Road will eliminate the Marten Falls First Nation's reliance on the seasonal winter road. Year-round access will reduce dependence on air transportation and improve access to goods, services and supplies while reducing travel costs considerably for community members, making everyday necessities more affordable. With one tank of gas costing between $100 to $200, compared to up to $2,120 to $4,000 for a return flight for a family of four, the road provides major financial savings. Road access will also reduce the travel costs for out-of-community recreational activities, health care appointments and mental health resources. Additionally, improved transportation will create new opportunities for local business es, employment, and community development, contributing to long-term resilience.

Beyond these economic and practical benefits, the Community Access Road could also strengthen cultural continuity and community well-being. By improving access to traditional lands and teaching sites, elders and knowledge holders would be better able to teach hunting, fishing, trapping, and food processing, supporting intergenerational knowledge transfer. More time spent on the land reinforces life skills and cultural values alongside technical harvesting practices, and could encourage everyday use of Indigenous languages. Community members may become more engaged in preparing and sharing country foods, deepening social bonds and enhancing food security. Easier access overall would support participation in cultural activities and help strengthen connections to language, identity, and culture.

The section documents the direct and indirect effects, the application of mitigation to minimize or eliminate effects where possible, and identification of residual effects. After residual effects are identified, they are then characterized using the criteria outlined in **Section 6.7.3**, **Table 6-1**. This process helps determine how impactful the effect is.

As described in **Section 8**, Marten Falls First Nation has chosen to group the disciplines into categories. **Table 9-1** outlines the specific disciplines identified for each group. Technical Support Documents for each discipline are available and provided in Appendix F to Appendix V.

This final version includes updated summaries and findings within the Technical Support Documents. **Section 9** provides a summary of the effects from each technical disciplines. In the event of inconsistency between this summary and the Technical Support Documents, refer to the information provided in **Appendices F** to **V**.

Table 9-1: Valued Component Groupings

Grouping	Discipline	Section
Water	• Surface Water • Fish and Fish Habitat • Groundwater and Geochemistry • Peatlands	9.3
Land	• Vegetation • Wildlife • Birds • Ungulates • Physiography, Soils and Terrain	9.4
People	• Acoustic and Vibration Environment • Aboriginal and / or Treaty Rights and Interests • Cultural Heritage and Archaeology • Atmospheric Environment • Community Well-Being • Land and Resource Use • Visual	9.5

9.1 Potential Discipline Interactions

As a first step in the process of completing the effects assessment, each discipline considered the potential project direct effects and how those effects may result in indirect effects to other disciplines. **Table 9.1-1** provides the preliminary analysis of Project-environment interactions for all disciplines.

Table 9.1-1: Potential Indirect Interactions Between Disciplines

Disciplines and Associated Valued Components	Aboriginal and Treaty Rights and Interests	Atmospheric Environment	Acoustic and Vibration Environment	Archaeological and Cultural Heritage	Community Well-Being	Fish and Fish Habitat	Groundwater and Geochemistry	Land and Resource Use	Peatlands	Physiography, Terrain and Soils	Surface Water	Vegetation	Visual Environment	Wildlife
Aboriginal and Treaty Rights and Interests	Not Applicable	○	○	○	■	○	○	■	○	○	○	○	○	○
Atmospheric Environment (Air Quality)	○	Not Applicable	○	○	■	○	○	○	○	○	■	■	○	○
Atmospheric Environment (Greenhouse Gases)	○	Not Applicable	○	○	■	○	■	■	■	■	■	■	○	■
Acoustic and Vibration Environment	■	○	Not Applicable	■	■	■	○	■	■	■	○	■	○	■
Archaeological and Cultural Heritage	■	○	○	Not Applicable	■	○	○	■	○	○	○	○	○	○
Community Well-Being	■	■	■	○	Not Applicable	■	■	■	■	○	■	■	■	■
Fish and Fish Habitat	○	■	■	○	○	Not Applicable	■	■	■	■	■	■	○	○
Groundwater and Geochemistry	○	○	○	○	■	○	Not Applicable	○	■	■	■	■	○	○
Land and Resource Use	○	■	■	○	■	■	○	Not Applicable	○	○	■	■	■	■
Peatlands	■	■	○	○	■	■	■	■	Not Applicable	■	■	■	■	■
Physiography, Terrain and Soils	○	■	○	○	○	○	■	○	■	Not Applicable	■	■	○	○
Surface Water	○	■	○	○	○	○	■	○	■	■	Not Applicable	■	○	○
Vegetation	■	■	○	■	■	○	■	■	■	■	■	Not Applicable	■	■
Visual Environment	○	○	○	○	■	○	○	■	○	○	○	○	Not Applicable	○
Wildlife	■	■	■	○	○	■	■	■	■	■	■	■	○	Not Applicable
Wildlife (Birds)	○	■	■	○	○	■ (osprey and bald eagle)	■	○	■	■	■	■	○	Not Applicable
Wildlife (Ungulates)	○	■	■	○	○	○	■	■	■	■	■	■	■○	Not Applicable

Footnotes: ■ = Potential pathway for indirect effect as a result of the Community Access Road
○ = No pathway for indirect effect is anticipated as a result of the Community Access Road

9.2 Effects Assessment Approach

The following is a broad overview of the approach for the identification, assessment, and evaluation of the potential effects for all the water, land and people disciplines:

- Review construction and operations activities to identify potential interaction(s) that could result in environmental effects;
- Identify potential environmental effects of the Preferred Route and recommend mitigation measures to avoid or minimize identified effects as well as identify opportunities to enhance benefits to the environment;
- Predict and assess potential environmental effects remaining after taking into consideration the recommended mitigation measures (in other words, residual effects) using direction, magnitude, geographic extent, duration, frequency, reversibility, uncertainty, significance, and likelihood;
- Predict cumulative effects that may result from a combination of the residual effects of the Preferred Route with the effects of other past, present, and reasonably foreseeable projects; and
- Identify a follow-up program for the Preferred Route that includes monitoring to verify the prediction of the effects assessment and effectiveness of the mitigation measures and a requirement for monitoring of the commitments made in the Environmental Assessment / Impact Statement.

Details on how each discipline completed these effects assessment activities are provided in the Technical Support Documents (**Appendix F** to **Appendix V**).

9.2.1 Discipline-Specific Characteristics

In support of the residual effects characteristics described in **Section 6.7.3**, **Table 6-1**, the following apply to the effects assessment with discipline-specific definitions in the below sections.

Ecological and Social Context

Context is considered one of the most critical factors when evaluating effects, and the effects assessment has considered potential or existing effects or pressures on ecological, social, economic, and health conditions affecting the sensitivity or resilience of a valued component.

The social context of the effect includes a discussion of the social and cultural consequences of the predicted effect and includes Indigenous Knowledge where

available. The current and future sensitivity and resilience of the valued component to change caused by the Community Access Road has also been considered.

The ecological context within which potential environmental, health, social and economic effects may occur has been taken into account when considering the effects criteria also described as effect characteristic and used interchangeably, such as species sensitivity and resilience, and includes Indigenous Knowledge where it was available. The ecological context of the effect includes a discussion of the environmental consequences of the predicted effect.

Consideration of context includes timing, when it is important in the evaluation of the effect, such as when the effect could occur during a species lifecycle window, or culturally significant period of time.

Magnitude

Magnitude refers to the amount of change in a measurable parameter relative to the existing conditions of a valued component, with and without the Community Access Road in place, or to other standards or guidelines. It is a measure of the intensity or the degree of change (in other words, effect size) caused by the Community Access Road and other developments, if applicable, relative to existing conditions.

When evaluating the magnitude of effects, this study considers both the proportion of the valued component affected within identified spatial boundaries and the relative effect.

9.2.2 Assessment of Significance

The assessment of significance of residual effects of the Community Access Road is informed by the interaction between the significance factors, with magnitude and geographic extent being the most important factors. Consideration is also given to context, which includes ecological context (in other words, the sensitivity and resilience of the valued components), and social context (in other words, concerns of Indigenous communities, interested agencies, groups and individuals raised during consultation and engagement and through review comments on the Technical Support Documents (**Appendices F** to **Y**). Implementation of proven mitigation measures is expected to aid in the avoidance or reduction of the magnitude, geographic extent, and / or duration of residual effects.

9.2.2.1 Determination of Significance

Using the overall residual effects characteristics for each discipline, each of the potential residual effects was assigned a significance level as a means of ranking the potential effects on the water, land and people. The significance levels are defined as:

- Significant: residual effects were considered to be significant if the majority of the residual effects characteristics were assessed as high in magnitude and long-term or permanent in duration, irreversible, at any geographic extent, or they represented a management concern; and
- Not Significant**:** residual effects were considered not significant if they demonstrated any other combination.

Taking into account the significance for each residual effect along with the context, an overall significance determination was completed.

9.3 Water

Anishinaabe nibi inaakonigewin (water law) tells us that water is life — nibi onje biimaadiiziiwin. We are born of water, and we are primarily composed of water. Not only does it give and take life, it is also a living being in and of itself that relies on a larger web of relationships to be well and to bring wellness to other beings.

9.3.1 Spatial Boundaries of Water Disciplines

As part of the effects assessment exercise, disciplines revised their effects assessment Study Area based on the development of the Preferred Route. The updated Local and Regional Study Areas for surface water, fish and fish habitat, groundwater and geochemistry and peatlands are shown on **Figure 9.3-1** to **Figure 9.3-3.**

Figure 9.3-1: Aquatics (Surface Water and Fish and Fish Habitat) Effects Assessment Local and Regional Study Area

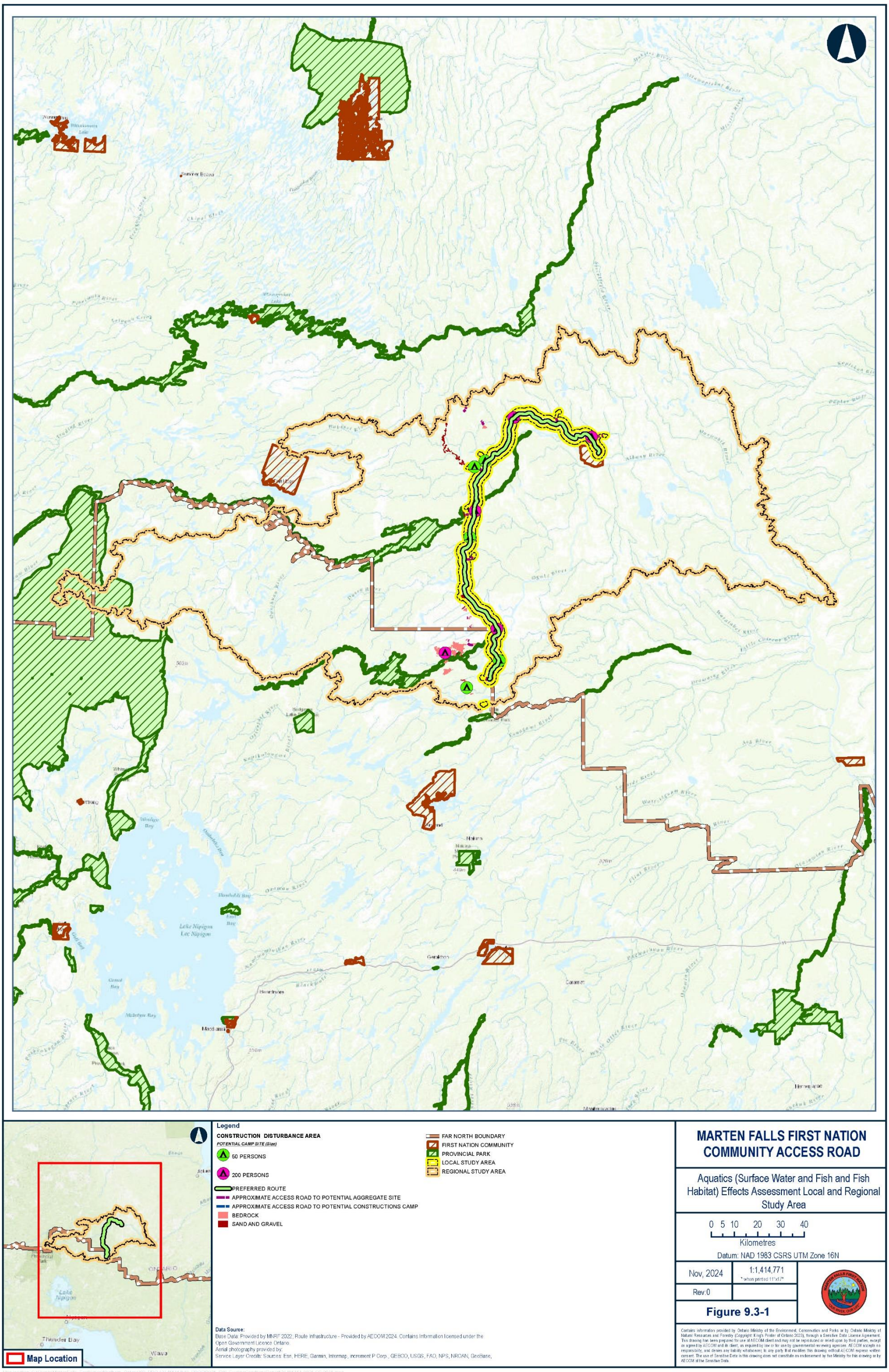


Figure 9.3-2: Groundwater Effects Assessment Local and Regional Study Area

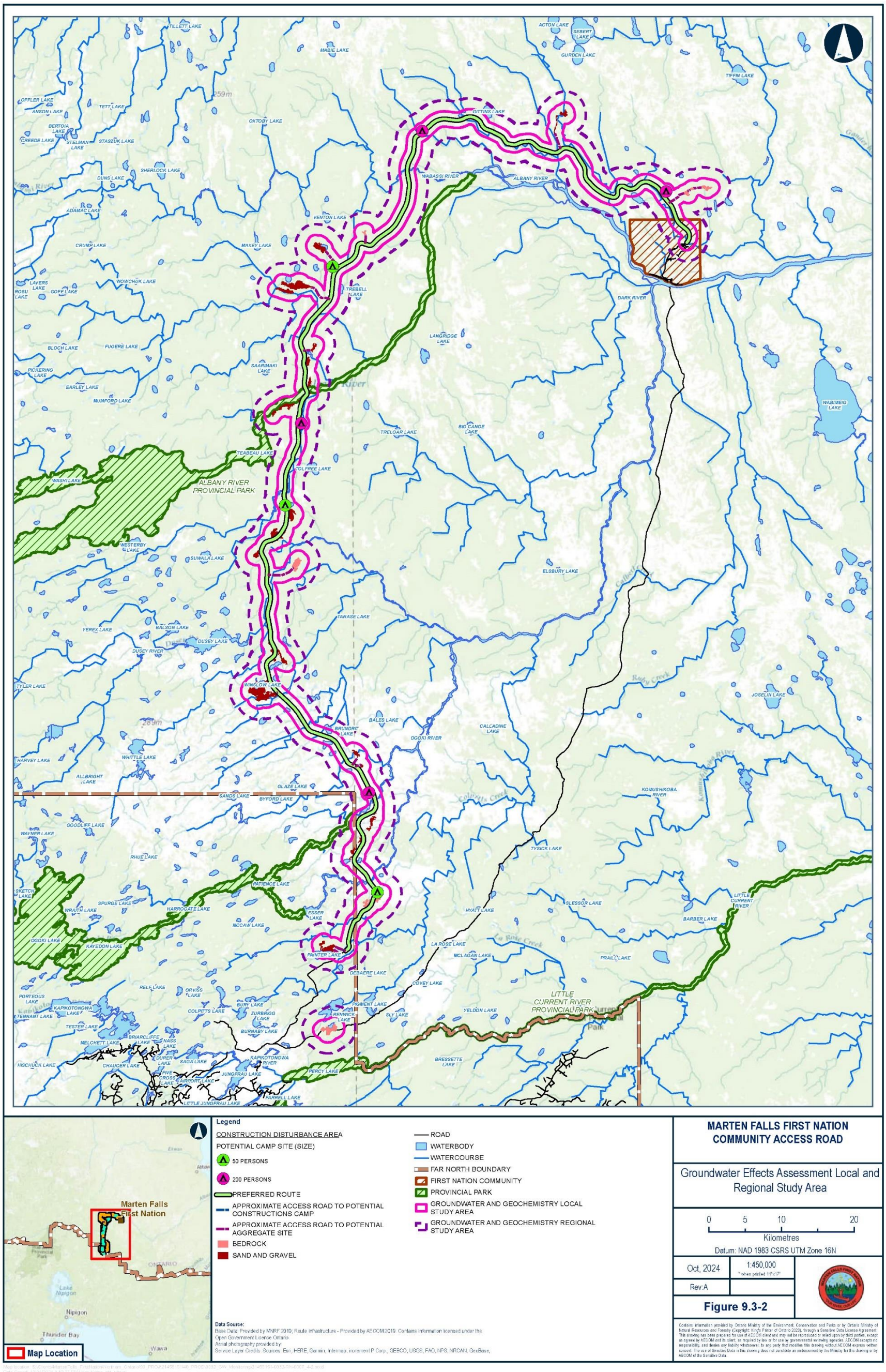
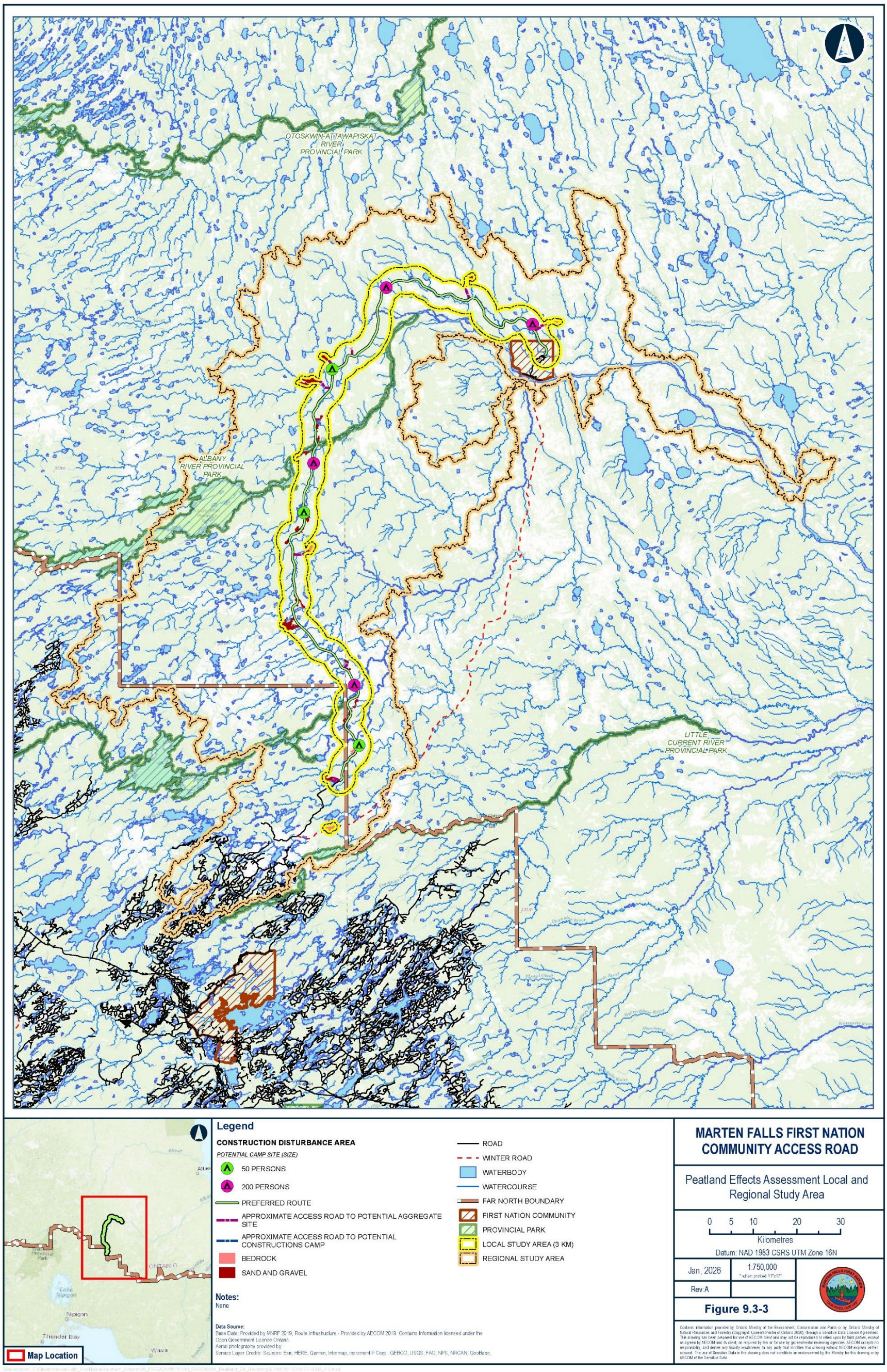


Figure 9.3-3: Peatlands Effects Assessment Local and Regional Study Area



9.3.2 Surface Water

9.3.2.1 Project-Environment Interactions

As a component of the effects assessment, the Project activities were reviewed to find potential environmental interactions. These interactions were then assessed for potential effects (**Table 9.3-1**).

Table 9.3-1: Project-Environment Interactions – Surface Water

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• Construction	• Clearing of the right-of-way for the Community Access Road and supporting access roads	• Surface Water Quantity • Surface Water Quality • Sediment Quality	• Changes in drainage patterns; • Changes in flow; • Changes in water levels; • Changes in channel hydraulics; • Changes in channel stability or erosion-sedimentation processes; • Change in physical parameters of water; • Change in chemical parameters of water; and • Change in physical and chemical characteristics of sediment.	• The overall effects due to Project-environment interaction during construction can be summarized as follows: – Changes to surface water quantity from short-term water taking; – Changes to surface water quantity, surface water quality, and sediment quality from short-term water discharges; – Changes to surface water quantity, surface water quality, and sediment quality during short-term water diversions at waterbody crossings; – Changes to surface water quantity, surface water quality, and sediment quality due to changes in channel hydraulics at waterbody crossings; – Changes to surface water quantity, surface water quality, and sediment quality due to changes in land cover; – Changes to surface water quality from the emission and deposition of airborne particulate matter to nearby waterbodies; – Changes to surface water quality from the wash-off of trash, domestic waste, and leachate at waste handling and storage facilities to nearby waterbodies; – Changes to surface water quality from the wash-off of organic debris from vegetation maintenance activities to adjacent waterbodies; – Changes to surface water quality and sediment quality from the wash-off of organic debris to nearby waterbodies and / or increased rates of erosion in disturbed and exposed areas with sediment transport and delivery to adjacent waterbodies; – Changes to surface water quality and sediment quality from the wash-off of fuel from accidental spills and leaks to nearby waterbodies; and – Changes to surface water quality and sediment quality from the wash-off of explosive chemicals or residue from spills and blasting activities to nearby waterbodies.
• Construction	• Blasting rock (for example maintaining road construction grade, aggregate activities)	• Surface Water Quantity • Surface Water Quality • Sediment Quality	• Same as previous	• Same as previous
• Construction	• Road construction (for example stripping, subgrade excavation, embankment fill placement, grading, ditching, concrete batch plants)	• Surface Water Quantity • Surface Water Quality • Sediment Quality	• Same as previous	• Same as previous
• Construction	• Bridge and culvert installation (for example approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls)	• Surface Water Quantity • Surface Water Quality • Sediment Quality	• Same as previous	• Same as previous

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• Construction	• Constructing and operating temporary infrastructure	• Surface Water Quantity • Surface Water Quality • Sediment Quality	• Same as previous	• Same as previous
• Construction	• Decommissioning temporary infrastructure	• Surface Water Quantity • Surface Water Quality • Sediment Quality	• Same as previous	• Same as previous
• Operations	• Operating the Community Access Road and permanent access roads	• Surface Water Quantity • Surface Water Quality • Sediment Quality	• Changes in drainage patterns; • Changes in flow; • Changes in water levels; • Changes in channel hydraulics; • Changes in channel stability or erosion-sedimentation processes; • Change in physical parameters of water; • Change in chemical parameters of water; and • Change in physical and chemical characteristics of sediment.	• The overall effects due to Project-environment interaction during operations can be summarized as follows: – Changes to surface water quantity, surface water quality, and sediment quality due to changes in channel hydraulics at waterbody crossings; – Changes to surface water quantity, surface water quality, and sediment quality due to changes in land cover – Changes to surface water quality from the emission and deposition of airborne particulate matter to nearby waterbodies; – Changes to surface water quality from the wash-off of organic debris from vegetation maintenance activities to adjacent waterbodies; and – Changes to surface water quality and sediment quality from the wash-off of fuel from accidental spills and leaks to nearby waterbodies.
• Operations	• Maintaining the Community Access Road and permanent access roads (if required), including bridges and culverts	• Surface Water Quantity • Surface Water Quality • Sediment Quality	• Same as previous	• Same as previous

9.3.2.2 Discipline-Specific Characteristics

In support of the residual effects characteristics described in **Section 6.7.3**, **Table 6-1**, the following surface water definitions apply to the effects assessment.

Ecological and Social Context

Ecological context for surface water considers existing trophic status, resilience, adaptive capacity, current status and trends, applicable legislation, and mitigation measures.

Magnitude

When evaluating the magnitude of effects, the surface water assessment considers both the proportion of the valued component affected within identified spatial boundaries and the relative effect.

For magnitude, environmental discipline-specific definitions were developed as part of the study plan and are provided in **Table 9.3-2** and **Table 9.3-3**. These definitions informed the reasoned narrative about magnitude in discussions. Magnitude of effects are Project-related and excludes variations due to climate change. For hydrology, the magnitude of anticipated effects will be based on the proportion of the catchment area for a given waterbody that is expected to be disturbed or influenced by Project activities. This approach considers drainage area as a proxy or analog for streamflow and, to a lesser extent, the potential for sediment erosion and transport. More specifically, the rationale for an effects magnitude of “Low” (identified in **Table 9.3-2** and **Table 9.3-3**) reflects the level of reliability of typical flow monitoring instrumentation (plus or minus 15 percent), coupled with observations and inferences from the literature that suggest minimal changes (if any) in streamflow and channel stability as a result of land disturbance if less than approximately 20 percent of the contributing drainage area is disturbed or influenced.

For surface water and sediment quality, the magnitude of anticipated effects will also consider the following federal and provincial water and sediment quality guidelines and objectives:

- Canadian Water Quality Guidelines for the Protection of Aquatic Life, Provincial Water Quality Objectives, Guidelines for Canadian Drinking Water Quality, and Ontario Drinking Water Quality Standards as may be applicable for surface water quality parameters; and
- Provincial Sediment Quality Guidelines and Canadian Sediment Quality Guidelines for the Protection of Aquatic Life as may be applicable for sediment quality parameters.

For parameters with multiple guidelines or objectives, the most stringent guideline or objective will be relied on for the assessment.

Table 9.3-2: Magnitude Definition for Surface Water Quantity (Hydrology)

Magnitude Level	Definition	Rationale
• **Negligible**	• There is little to no variation predicted in indicator parameters, meaning that, where applicable for a given waterbody, the proportion of the catchment area disturbed or influenced by a specific Project activity is less than 5 percent. As such, indicator parameters are expected to remain within the range of natural variation.	• No discernable changes to hydrology and therefore no anticipated changes to aquatic life or potable sources of water.
• **Low**	• There is a small variation predicted in indicator parameters, meaning that, where applicable for a given waterbody, the proportion of the catchment area disturbed or influenced by a specific Project activity is between 5 percent and 20 percent. As such, the indicator parameters are expected to vary to within the upper or lower limits of, or just outside, the range of natural variation.	• Changes to hydrology are discernable, but it is anticipated that surface water quantity conditions remain protective of aquatic life and potable sources of water.
• **Medium**	• There is a moderate variation predicted in indicator parameters, meaning that, where applicable for a given waterbody, the proportion of the catchment area disturbed or influenced by a specific Project activity is between 20 percent and 50 percent. As such, the indicator parameters are expected to vary outside the range of natural variation.	• Changes to hydrology are discernable and / or statistically significant, but it is anticipated that surface water quantity conditions remain protective of aquatic life and potable sources of water.
• **High**	• There is a large variation predicted in indicator parameters, meaning that, where applicable for a given waterbody, the proportion of the catchment area disturbed or influenced by a specific Project activity is greater than 50 percent. As such, indicator parameters are expected to vary outside the range of natural variation.	• Changes to hydrology are discernable and / or statistically significant and may impair aquatic life or potable sources of water.

Table 9.3-3: Magnitude Definition for Surface Water and Sediment Quality

Magnitude Level	Definition	Rationale
• **Negligible**	• There is little to no variation predicted in indicator parameters and, as such, the indicator parameters are expected to remain within the range of natural variation.	• No changes to surface water and or sediment quality are discernable and therefore no changes to aquatic life or potable sources of water are anticipated.
• **Low**	• There is a small variation predicted in the indicator parameters such that the indicator parameters are expected to vary within or just outside the range of natural variation (in other words, by less than 20 percent outside the range of natural variation), but they remain below applicable guideline / objective or threshold values (assuming that indicator parameters satisfy the relevant guideline / objective or threshold values under existing conditions).	• Changes to surface water and / or sediment quality are discernable but are anticipated to remain protective of aquatic life and potable sources of water.
• **Medium**	• There is a modest variation predicted in the indicator parameters such that indicator parameters are expected to vary outside the range of natural variation (in other words, by 20 to 50 percent) but remain below the applicable guideline / objective or threshold values (assuming that indicator parameters satisfy the relevant guideline / objective or threshold values under existing conditions).	• Changes to surface water and / or sediment quality are readily discernable and, where applicable, of potentially statistical significance, but are anticipated to remain protective of aquatic life and potable sources of water.
• **High**	• There is a large variation predicted in the indicator parameters such that indicator parameters are expected to vary outside the range of natural variation (in other words, by more than 50 percent) and / or exceed applicable guideline / objective or threshold values.	• Changes to surface water and / or sediment quality are readily discernable and / or could potentially impair aquatic life or potable sources of water.

9.3.2.3 Residual Effects - Construction Phase

9.3.2.3.1 Changes to Surface Water Quantity from Short-Term Water Taking

9.3.2.3.1.1 Potential Effects

During construction, short-term water takings may be required from surface water or both the surface water and groundwater sources for the purposes of construction water supply. These short-term water takings could result in changes to surface water quantity in the form of reductions in streamflows and / or water levels at nearby waterbodies. The specific locations for short-term water takings, as well as the anticipated water taking duration and volumes, will be determined during the permitting and detail design stage of the Project. These water takings may include:

- Dewatering of excavations for road construction and waterbody crossing structure foundations (for example, bridges and culverts), if required;
- Dewatering for quarry operations, if required;
- Water diversion to create and maintain a dry work area for the construction of waterbody crossings;
- Water for drilling;
- Water for onsite concrete mixing and earthworks (compaction);
- Water for dust suppression at work sites and along access roads;
- Water for construction of temporary access roads, trails, and winter roads (in other words, snow fills, ice bridges, and maintenance);
- Water for washing concrete mixing equipment, concrete delivery systems, vehicles, and equipment as well as for work sites, temporary construction camps, and temporary laydown areas; and
- Water for drinking and sanitation at construction offices, temporary construction camps, temporary laydown areas, and other work areas.

9.3.2.3.1.2 Mitigation and Enhancement Measures

All short-term water takings from surface water and / or groundwater sources for construction purposes will be carried out in accordance with Ontario Regulation 387/04: Water Taking and Transfer under the Ontario *Water Resources Act* as amended by Ontario Regulation 64/16 (Government of Ontario, 1990c) and industry best standards, recognizing that designated water taking activities will require registration on the

Environmental Activity and Sector Registry or a Permit to Take Water from the Ministry of the Environment, Conservation and Parks. As part of the permitting and / or approvals process through Environmental Activity and Sector Registry and Permit to Take Water, a Water Taking and Discharge Plan will be developed for each source of water taking, as required, noting that, by design, the daily and instantaneous rates of water taking associated with the plan will be protective of the existing surface water, groundwater, and natural environment conditions in the local area and, in turn, are expected to result in minimal changes (if any) to streamflows and / or water levels at nearby waterbodies. Water flow and / or levels triggers will be developed for sensitive water sources that have potential of being affected by water takings. These actions will be site-specific and will be developed to support necessary Permit to Take Water applications. Water flow and / or levels triggers will be developed for sensitive water sources that have potential of being affected by water takings. These actions will be site-specific and will be developed to support necessary Permit to Take Water applications. Water quantity and quality monitoring will be completed, where appropriate, to confirm the effectiveness of the Water Taking and Discharge Plan and associated mitigation measures as well as to maintain compliance with regulatory permits / approvals.

The specific requirements for short-term water taking and discharge activities will be determined during the permitting and detail design stage of the Project. An initial engagement with Ministry of the Environment, Conservation and Parks will be used to establish the preferred method to apply for and secure water-taking- and discharge-related permits and approvals. It is possible that specific water taking and discharge activities may be eligible for Environmental Activity and Sector Registry (for example, construction dewatering between 50,000 and 400,000 litres per day during excavations for the Community Access Road and waterbody crossing structure foundations), noting that each relevant Environmental Activity and Sector Registry would be tied to a discrete activity and location along the Project alignment. Other water taking and discharge activities will require a Permit to Take Water (for example, direct surface water taking from a lake or river of greater than 50,000 litres per day for the purposes of water supply), recognizing that multiple sources of surface water takings or surface water and groundwater takings could potentially be captured under a single Permit to Take Water. Noting that although water takings associated with waterbody crossing structure foundations, including groundwater and stormwater may be eligible for Environmental Activity and Sector Registry, water taking directly from a stream/river water to accommodate waterbody crossing structure foundation work may need to be pumped and may require a Permit to Take Water. Additionally, water takings for highway and transit projects, for purposes such as hydro-demolition, cleaning and flushing, seeding, mulching, sodding or landscaping, dust suppression, compaction of

earth and granular materials, and onsite preparation of materials to be used in the construction, maintenance or repair of the highway may be activities eligible to register on the Environmental Activity and Sector Registry. Where the activity does not meet the criteria for an Environmental Activity and Sector Registry, a Permit to Take Water may be required. Finally, it is understood that discharge of wastewater from stormwater management facilities and other sewage works will require an Environmental Compliance Approval (for example, wash water from vehicles and equipment, wastewater from concrete batch plants, and domestic wastewater and grey water from domestic use to leaching beds [if daily flow rates are more than 10,000 litres per day]).

Dewatering for the safe and efficient operation of pits and quarries and water takings for other construction-related activities (for example, to supply concrete batch plants, for earthworks and for washing vehicles and equipment) will be in compliance with the approval conditions of the Permit to Take Water (if the water taking is greater than 50,000 litres per day) and / or carried out in a manner that avoids unacceptable negative environmental effects or interference with other water users. Construction water sources and volume of water for concrete production is not known at this stage of Project planning but will be conducted in accordance with applicable regulatory requirements. Water used for dust suppression will be brought to the site via tanker trucks. Calcium chloride may be used along roads to reduce dust and improve safety where there is increased Project traffic interface with public road users. Application of calcium chloride by the Marten Falls First Nation and / or the owner / operator will be completed in consultation with road authorities and will not occur within 120 metres of a waterbody or wetland.

Potable water for work sites, temporary construction camps, and temporary laydown areas will be obtained from the surface water sources with appropriate treatment as needed and / or from bottled sources for drinking and sanitation. If necessary, as a last resort, groundwater wells may be drilled at the temporary construction camps in accordance with Revised Regulations of Ontario, 1990 (Regulation 903: Wells), under the Ontario *Water Resources Act* (Government of Ontario, 1990c).

Overall, all water taking will be in compliance with the applicable legislation, regulations, and best industry practices.

9.3.2.3.1.3 Predicted Residual Effects

Measurable changes to surface water quantity (in other words, residual effects) are predicted to occur as a result of water taking activities, even with the effective implementation of the mitigation measures identified previously. The measurable changes would potentially involve reduction in streamflows and / or water levels at

waterbodies (specific to or adjacent to the source of the water taking). Therefore, this Project–environment interaction during construction is carried forward to the residual effects characterization.

Short-term water takings from surface water or surface water and groundwater sources for the purposes of construction and water supply could result in changes to surface water quantity in the form of reductions in streamflows and / or water levels at nearby waterbodies (specific to or adjacent to the source of the water taking). The specific locations for short-term water takings, as well as the anticipated water taking duration and volumes, will be determined during the permitting and detail design stage of the Project. The likelihood of occurrence of the residual effect was assessed as probable (the effect is likely to occur). Based on the criteria discussed, the effect was carried forward into the cumulative effects assessment.

9.3.2.3.2 Changes to Surface Water Quantity, Surface Water Quality, and Sediment Quality from Short-Term Water Discharges

9.3.2.3.2.1 Potential Effects

Discharges of water from Project activities during construction could result in changes to both surface water quantity and quality and to sediment quality if not effectively mitigated. Discharges could result in an increase to streamflow and / or water levels in receiving waterbodies as well as an increase to the concentrations of suspended solids and chemical constituents in these same receivers. Sources of water during construction include:

- Construction water from dewatering activities during excavations for road construction and waterbody crossing structure foundations;
- Water from dewatering activities during operation of pits and quarries;
- Water from aggregate and concrete batch plants;
- Wash water from cleaning concrete mixing equipment and concrete delivery systems on work sites;
- Wash water from vehicle and equipment wash facilities on work sites, at temporary construction camps, and at temporary laydown areas; and
- Domestic wastewater and grey water from temporary construction camps and construction offices.

9.3.2.3.2.2 Mitigation and Enhancement Measures

All discharges of Project water will be conducted in accordance with Ontario Regulation 387/04: Water Taking and Transfer under the Ontario *Water Resources Act* as amended by Ontario Regulation 64/16 (Government of Ontario, 1990c) or Ontario Regulation 63/16 under the *Environmental Protection Act* (Government of Ontario, 1990d), where applicable, recognizing that these discharge activities will require permits or approvals through the Ministry of the Environment, Conservation and Parks Environmental Activity and Sector Registry, Permit to Take Water, or an Environmental Compliance Approval. As part of the permitting and / or approvals process associated with Environmental Activity and Sector Registry, Permit to Take Water, and Environmental Compliance Approval, a Water Taking and Discharge Plan and supporting technical analysis will be developed for each source of construction water, wastewater, and wash water, as required, noting that, by design, the applicable water quantity and quality criteria (for example, effluent limits) associated with the plan will be protective of the existing surface water, groundwater, and natural environment conditions in the local area and, in turn, are expected to result in minimal changes (if any) to streamflows, water levels, and the concentrations of suspended solids and chemical constituents in nearby waterbodies. Water quantity and quality monitoring will be completed, where appropriate, to confirm the effectiveness of the discharge plan and associated mitigation measures as well as to maintain and demonstrate compliance with regulatory permits / approvals.

It is recognized that wastewater associated with discharges from Project activities will need to be characterized, and in some cases, an assimilative capacity study may need to be carried out to accurately assess the potential effect of the discharge on the receiving environment and develop effluent limits where necessary. The specific requirements for short-term water taking and discharge activities will be determined during the permitting and detail design of the Project. An initial engagement with Ministry of the Environment, Conservation and Parks will be used to establish the preferred method to apply for and secure water-taking- and discharge-related permits and approvals. It is possible that specific water taking and discharge activities may be eligible for Environmental Activity and Sector Registry (for example, construction dewatering between 50,000 and 400,000 litres per day during excavations for access road and waterbody crossing structure foundations), noting that each relevant Environmental Activity and Sector Registry would be tied to a discrete activity and location along the Project alignment. Other water taking and discharge activities (for example, direct surface water taking from a lake or river of greater than 50,000 litres per day for the purposes of water supply) would require a Permit to Take Water. Finally, if daily flow rates are more than 10,000 litres per day, it is understood that discharge of

water from stormwater management facilities and other sewage works will require an Environmental Compliance Approval (for example, wash water from vehicles and equipment, water from concrete batch plants, and domestic wastewater and grey water from temporary construction camps and construction offices).

Further to the mitigation measures described previously, the following will also be implemented for the Project during construction:

- Concrete for the Project will be produced in batch plants at pits and quarries and delivered to site in concrete mixer trucks to the extent feasible. Where applicable, treatment and disposal of water from any such concrete batch plants will be in compliance with Environmental Compliance Approvals issued by the Ministry of the Environment, Conservation and Parks under the *Environmental Protection Act* (Government of Ontario, 1990d);
- Wash water from cleaning concrete mixing equipment and delivery systems, as well as from vehicles and equipment, will be collected in designated wash-out sites, located at least 30 metres from a waterbody. The wash-out site will be monitored regularly to verify that runoff from the area does not report to a waterbody (in other words, does not contaminate waterbody with foreign material). Following Construction, all temporary wash-out sites will be capped with local backfill and regraded prior to construction crews departing the site;
- Domestic wastewater from temporary construction camps and construction offices / sites will be disposed of on site, where possible, in leaching beds constructed at the temporary construction camps, approved under the Ontario Building Code 2012 (Ontario Regulation 332/12: Building Code) under *Building Code Act* (Government of Ontario, 1992). The treatment unit (in other words, septic tank system) will be connected to a leaching bed constructed in accordance with the requirements of Section 8.7 of the Ontario Building Code. In compliance with the Code, leaching beds will be sited a minimum of 15 metres away from any waterbody. A sewage Environmental Compliance Approval may be required for the leaching beds serving the temporary construction camp, depending on the total theoretical flow rate, noting that a sewage Environmental Compliance Approval would be needed if the theoretical daily flows of domestic wastewater and grey water are more than 10,000 litres per day, while a permit from the Ministry of Natural Resources, who is a partner with Ministry of Northern Development; Ministry of the Environment, Conservation and Parks; and Ministry of Municipal Affairs and Housing for waste management in unincorporated territory, would be required instead if the theoretical daily flows are less than 10,000 litres per day. Further, if required and when feasible, wastewater will be

collected in approved vehicles and hauled to wastewater treatment plants authorized to accept this type of wastewater;

- Discharging construction/wastewater, that may not require an Environmental Compliance Approval, at a minimum to down-gradient low lying vegetation area to promote infiltration, and utilizing measures such as filter fabric on inlet pump head and / or straw bale/filter fabric device or equivalent to minimize sediment transport during excavation / construction dewatering; and
- Marten Falls First Nation and / or the owner / operator will review discharge sites / locations to avoid discharging to sensitive areas, including areas identified through the Indigenous Knowledge Program.

9.3.2.3.2.3 Predicted Residual Effects

The use of short-term water diversion to create and maintain a dewatered area to support installation of temporary and permanent waterbody crossings and removal of temporary waterbody crossing structures may result in a measurable increase or reduction in streamflows, water levels, and erosion–sedimentation processes at locations upstream or downstream of the waterbody crossing and an increase to the concentrations of suspended solids and chemical constituents in waterbodies, even with the implementation of the mitigation identified previously. Therefore, this Project–environment interaction during construction is carried forward to the residual effects characterization.

Discharges of construction water, dewatering of quarries, and wash water from Project activities during construction have the potential to result in changes to surface water quantity in the form of an increase in streamflows and / or water levels at receiving waterbodies. It could also result in changes to surface water and sediment quality in the form of an increase to the concentrations of suspended solids and chemical constituents in receiving waterbodies. The specific locations for short-term discharges will be determined during the permitting and detail design stage of the Project. Where appropriate, construction water, or wash water from Project activities will be discharged to a well-vegetated ground surface at a distance greater than 30 metres from a waterbody and treated prior to discharge in compliance with Environmental Activity and Sector Registry, Permit to Take Water or Environmental Compliance Approval, if required. The likelihood of occurrence of the residual effect was assessed as probable (the effect is likely to occur). Based on the criteria discussed, the effect was carried forward into the cumulative effects assessment.

9.3.2.3.3 Changes to Surface Water Quantity, Surface Water Quality, and Sediment Quality During Short-Term Water Diversions at Waterbody Crossings

9.3.2.3.3.1 Potential Effects

The potential effects on both surface water quantity and quality and to sediment quality may include:

- Localized changes to streamflows and / or water levels and erosion–sedimentation processes within or immediately upstream and downstream of the work area, depending on the dewatering method and dewatering controls chosen (for example, pumping rates that exceed streamflow conditions could result in a decrease in water levels upstream of the diversion works and, in turn, a slight increase downstream);
- Increases to the concentrations of suspended solids in waterbodies as a result of increased rates of erosion–sedimentation processes during water taking and discharge activities (specific to the points of water taking and discharge in the waterbody) or following the removal of the diversion works and / or installation or removal of temporary waterbody crossing structures due to the disturbance of the bed and banks of the waterbody (specific to the limits of the work area, with the opportunity for sediment to be mobilized and transported downstream); and
- Increases to the concentrations of chemical constituents in waterbodies due to equipment leaks.

There will also be the temporary, short-term, and local bypass of flow through the work site (in other words, change in drainage patterns) and the potential for increased rates of erosion–sedimentation following the removal of the diversion works and / or installation or removal of temporary waterbody crossing structures due to the disturbance of the waterbody bed and banks within the work area.

A review of lists of waterbody crossings on the Community Access Road and supporting access roads indicate the following:

- A total of 45 permanent waterbody crossings are planned for Preferred Route right-of-way and a total of 24 waterbody crossings are planned for access roads; and
- Approximately 44 (98 percent) of the Preferred Route right-of-way waterbody crossing locations are on waterbodies with permanent flow regime, while the remaining 1 crossing (2 percent) are on waterbodies with unknown flow regime.

Based on the surficial geology underlying the waterbody crossings, the following is observed:

- 21 (47 percent) of the waterbody crossings are located over organic deposits;
- 11 (24 percent) of the waterbody crossings are located over till;
- 4 (9 percent) of the waterbody crossings are located over bedrock; and
- The remaining waterbody crossings are located over glaciolacustrine deposits (4 percent) and unknown surficial geology (16 percent).

The waterbody crossings located over bedrock (exposed or covered by a thin layer of drift) are expected to be relatively stable with a lower likelihood of experiencing increased opportunities for erosion–sedimentation processes.

9.3.2.3.3.2 Mitigation and Enhancement Measures

Short-term water diversions (active or passive) will be carried out in accordance with Ontario Regulation 387/04: Water Taking and Transfer under the Ontario *Water Resources Act* as amended by Ontario Regulation 301/21 (Government of Ontario, 1990c). This includes the implementation of the following conditions under Ontario Regulation 387/04, which represent the key mitigation for the diversion works and allow exemption from Permit to Take Water or Environmental Activity and Sector Registry approvals:

- Diverted water will remain in, or be directed back to, the same waterbody (for example, pumped water from a waterbody will be returned to that same waterbody at a location immediately downstream of the construction area);
- The diversion works will be installed / operated to maintain water quality and quantity conditions upstream and downstream of the construction area;
- Pumped water will contain no visible contaminants (for example, petroleum hydrocarbon sheen of film);
- Sediment and erosion control measures will be properly installed and maintained, with a plan to dispose of any trapped / collected materials after diversion activities have been completed; and
- Marten Falls First Nation with the owner / operator will satisfy these conditions and will construct the waterbody crossings in compliance with Ministry of Natural Resources approvals, required under Ontario Regulation 454/96 of the *Lakes and Rivers Improvement Act* (Government of Ontario, 1990f), as applicable. The purpose of Ministry of Natural Resources approvals is to prevent alteration to fish and wildlife habitat, flooding, erosion, and pollution. Waterbody crossings will be

designed and constructed in accordance with the Ministry of Natural Resources' Environmental Guidelines for Access Roads and Water Crossings (Ministry of Natural Resources, 1990) as well as Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales (Ministry of Natural Resources, 2010) and Technical Guide River and Stream Systems: Flooding Hazard Limit (Ministry of Natural Resources, 2002), as applicable.

Marten Falls First Nation with the owner / operator will manage dewatering activities to minimize potential adverse environmental effects and interference with downstream water users. Planned mitigation and enhancement measures consist of the following:

- Minimizing the number of waterbody crossings required, to the extent possible, by appropriate alignment of the right-of-way and access roads;
- Limiting the number of waterbody crossings installed simultaneously on a single waterbody, where more than one crossing structure is required;
- Constructing waterbody crossings in compliance with Ministry of the Environment, Conservation and Parks-specified conditions and Ministry of Natural Resources approvals, if required;
- Accounting for streamflow changes (under extreme storm events) caused by climate change in the planning and design of short-term diversions; and
- Constructing waterbody crossings over a relatively short time period and under low water conditions (during the winter and / or summer seasons) where possible.

To account for climate change effects, Marten Falls First Nation will also implement mitigation measures as outlined in Climate Adaption and Resiliency Technical Support Document (**Appendix Y**). Specific measures to be undertaken during water diversion activities to satisfy the conditions listed previously will be determined during detail design.

The implementation of these mitigation measures are anticipated to limit the potential for changes to streamflows, water levels, and erosion–sedimentation processes at the time of the active or passive diversion works as well as the potential for increased rates of erosion–sedimentation following the removal of the diversion works and / or installation or removal of temporary waterbody crossing structures due to the disturbance of the bed and banks of the waterbody (within the limits of the work area).

Project activities are not expected to result in consequential increases to suspended solids and associated chemical constituents (in other words, metals) in waterbodies crossed by the Project due to diversions, beyond the concentrations observed during

existing conditions studies completed to assess surface water conditions. That said, the use of short-term water diversions to create and maintain a dewatered area to support installation of temporary and permanent waterbody crossings and removal of temporary waterbody crossing structures, may result in a measurable increase or reduction in streamflows, water levels, and erosion-sedimentation processes at discrete locations upstream or downstream of the waterbody crossing, resulting in an increase to the concentrations of suspended solids and chemical constituents in waterbodies during these short-term water diversions.

9.3.2.3.3.3 Predicted Residual Effects

The use of short-term water diversion to create and maintain a dewatered area to support installation of temporary and permanent waterbody crossings and removal of temporary waterbody crossing structures may result in a measurable increase or reduction in streamflows, water levels, and erosion–sedimentation processes at locations upstream or downstream of the waterbody crossing and an increase to the concentrations of suspended solids and chemical constituents in waterbodies, even with the implementation of the mitigation identified previously. Therefore, this Project–environment interaction during construction is carried forward to the residual effects characterization.

The installation and removal of water crossing structures during construction, along with short-term water diversions, could result in the following potential changes to surface water quantity:

- Localized increases or reductions in streamflows, water levels, and erosion–sedimentation processes, depending on the specific assessment point relative to the work area (in other words, upstream or downstream of the isolation works, or within the dewatered area) and the diversion method and operations; and
- Localized increases in in-stream erosion–sedimentation processes at the points of the water taking and discharge (to facilitate the diversion).

There will also be temporary, short-term, and local bypass of flow through the Construction Disturbance Area (in other words, change in drainage patterns) and the potential for increased rates of erosion–sedimentation following the removal of the diversion works and / or installation or removal of waterbody crossing structures due to the disturbance of the bed and banks of the waterbody within the limits of the work area.

The installation and removal of waterbody crossing structures, along with short-term water diversions, could result in the following potential changes to surface water and sediment quality:

- Localized increase to the concentration of suspended solids in waterbodies as a result of increased rates of erosion–sedimentation processes during water taking and discharge activities (specific to the points of water taking and discharge in the waterbody to facilitate the diversion) or following the removal of the diversion works and / or installation or removal of waterbody crossing structures due to the disturbance of the bed and banks of the waterbody (specific to the limits of the work area, with the opportunity for sediment to be mobilized and transported downstream); and
- Localized increases to the concentrations of chemical constituents in waterbodies due to equipment leaks.

Based on the criteria discussed, the effect was carried forward into the cumulative effects assessment.

9.3.2.3.4 Changes to Surface Water Quantity, Surface Water Quality, and Sediment Quality due to Changes in Channel Hydraulics at Waterbody Crossings

9.3.2.3.4.1 Potential Effects

The installation of temporary and permanent waterbody crossing structures during construction of the Community Access Road may result in changes to channel hydraulics at the affected portion of the waterbody and, in turn, potential changes in surface water quantity due to modifications in channel form and function. More specifically, the installation of waterbody crossing structures may result in a localized increase or reduction to flow velocities, shear stresses, water levels, and erosion–sedimentation processes at locations upstream or downstream of the crossing. For example, local impedance of streamflow (in other words, backwater with an increase in water levels and opportunities for sedimentation) may occur upstream of a waterbody crossing, with a corresponding reduction in flow velocities and shear stresses. There is also the potential for a localized increase in flow velocities at the inlets (Oji-Cree translation, zaakiing) and outlets of waterbody crossing structures, which in turn could result in increased rates of erosion at the waterbodies. These effects were also noted as a concern within the community of Marten Falls First Nation and Fort Albany First Nation. Specifically, Marten Falls First Nation highlighted generalized concerns related to how the construction of infrastructure such as bridges might result in effects on surface water quality (Marten Falls First Nation, 2023), and Fort Albany First Nation

noted concerns relating to how the Project could act as an additional barrier to natural water flow. Fort Albany First Nation also highlight specific concerns related to how the Attawapiskat River, Albany River, Moose River, and Winisk River might be impacted as a result (Firelight Research Inc., 2024).

By extension, an increase to erosion and shear stress processes (both of which are tied to surface water quantity) in the vicinity of the waterbody crossing structure may result in an effect on surface water and sediment quality due to the associated increase to downstream concentrations of suspended solids, while an increase to sedimentation upstream of the crossing structure could instead result in a corresponding decrease to downstream concentrations of suspended solids.

9.3.2.3.4.2 Mitigation and Enhancement Measures

Waterbody crossing structures will be designed and constructed in accordance with permits and approvals through Fisheries and Oceans Canada and / or Ministry of Natural Resources, if applicable. All newly installed or upgraded crossing structures at mapped or unmapped waterbodies are expected to require permitting through one or more of Ontario Regulation 239/13 under the *Public Lands Act* (Government of Ontario, 1990h) for water crossings on traditional territory and Ontario Regulation 454/96 under the *Lakes and Rivers Improvements Act* (Government of Ontario, 1990f) for water crossings on Private or traditional territory. It is also expected that approvals through Fisheries and Oceans Canada under the protocol for the review and approval of forestry water crossings protocol will be required (Ministry of Natural Resources and Forestry and Fisheries and Oceans Canada, 2021).

Marten Falls First Nation recognises the importance of climate change effects on the Project. Climate Adaption and Resiliency Technical Support Document (**Appendix Y**) identified and evaluated the risk that climate-related hazards may have on the Marten Falls First Nations Community Access Road, the indigenous communities and the Natural Environment, and provided recommendations to mitigate the associated risks. Climate change is anticipated to effect rainfall amounts and intensities that could lead to increased streamflows in waterbodies which in return can amplify potential effects at waterbody crossings, if not mitigated.

Marten Falls First Nation will implement mitigation measures as outlined in Climate Adaption and Resiliency Technical Support Document (**Appendix Y**). In addition, it is worth highlighting that the design of waterbody crossing structures (culverts and bridges) will consider climate change effects. Specific measures to be undertaken to mitigate the climate change effects at waterbody crossings will be determined during detail design.

The specific configuration of waterbody crossing structures, including clear span bridges, bridges with piers and abutments, and culverts, will be primarily based on hydrologic and hydraulic design flow calculations, which consider, but are not limited to, expected rainfall and peak flow within the geographic area (including climate change), as well as the relevant catchment area, channel slope, and channel substrate.

At some locations where it is determined that spring-melt or storm runoff needs to pass from one side of the right-of-way to the other to prevent flooding and / or erosion, equalization culverts will be installed. The purpose of equalization culverts is to maintain the existing surface water drainage patterns in the area. Culverts will be put in place as construction progresses along the Community Access Road.

Each waterbody crossing will be visited ahead of construction by qualified environmental personnel, fisheries biologists and / or technicians (in other words, Aquatics Specialist) to verify that the crossing location is conducive to the planned crossing structure installation, such that any changes in site conditions can be addressed through necessary design adjustments. If site-specific features prevent the installation of a crossing structure, a different crossing method will be selected and implemented. During pre-construction site visits, surface water surveys at any waterbody crossing location that has not already been assessed as part of the field investigations will be conducted.

Marten Falls First Nation, with the owner / operator, will carefully design and construct waterbody crossing structures to minimize potential adverse environmental effects resulting from changes to cross-section hydraulics. If site-specific changes to waterbody crossing structure type are required, engagement with appropriate regulatory authorities (in other words, Fisheries and Oceans Canada, Ministry of Natural Resources) will occur prior to any instream construction activities, where appropriate (in other words, placement of additional fill, regrading and / or stabilization of bed or banks). Similar to short-term water diversions, the mitigation measures to reduce the potential effects on cross-section hydraulics will involve the following:

- Minimizing the number of waterbody crossings required, to the extent possible, by appropriate alignment of the right-of-way for the Community Access Road, and use of existing roads or trails;
- Carrying out construction activities without any permanent in-water works (in other words, permanent waterbody crossings will be installed above the high-water mark) is anticipated except where culverts will be used;
- Designing the infrastructure at waterbody crossings to pass peak flows (including extreme storm events caused by climate change, as appropriate) and maintain

sufficient flow conveyance in such a way that no discernible effects on stream hydraulics occur;

- Maintaining the characteristic channel width, depths, slopes, and substrate in the event that a channel realignment is required, noting that:
  - Channel realignments and / or infillings will be avoided through Project planning and design to the extent practicable by fitting a culvert to the creek alignment to minimize change in stream morphology;
  - Channel realignments and / or infilling will only be undertaken in locations where specific conditions are met and / or where required for safety and security purposes; and
  - Changes to stream morphology, including fitting a culvert to the channel alignment to minimize changes in stream morphology, will like likely require approval by Fisheries and Oceans Canada, with the plan and mitigations requiring reviewed by Ministry of Natural Resources through permitting the water crossing;
- Implementing erosion and sediment control measures prior to commencing construction work;
- Returning the watercourse banks to their original profile and stabilizing disturbed areas as necessary to prevent soil erosion upon completion of construction work;
- Designing and constructing waterbody crossings in compliance with Ministry of Natural Resources' Environmental Guidelines for Access Roads and Water Crossings (Ministry of Natural Resources, 1990) as well as Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales (Ministry of Natural Resources, 2010) and Technical Guide River and Stream Systems: Flooding Hazard Limit (Ministry of Natural Resources, 2002), as applicable;
- Constructing waterbody crossings in compliance with Ministry of Natural Resources approvals; and
- Reclaiming temporary waterbody crossings at the end of construction.

9.3.2.3.4.3 Predicted Residual Effects

Even with the effective implementation of the mitigation and enhancement measures identified previously, the installation of waterbody crossings along the right-of-way of the Community Access Road and support access roads may result in measurable changes (in other words, residual effects) to channel hydraulics at some crossing locations, with the potential for changes in surface water quantity (in other words, localized increase or reduction to flow velocities, shear stresses, water levels, and erosion–sedimentation

processes at locations upstream or downstream of the crossing) and quality (increase or reduction to the concentrations of suspended solids at locations downstream of the crossings due to the corresponding changes to erosion–sedimentation processes in the vicinity of the crossing). Therefore, this Project–environment interaction during construction is carried forward to the residual effects characterization.

The changes to channel hydraulics at waterbody crossings have the potential for a localized increase or reduction in the concentrations of suspended solids at locations downstream of the crossings (for example, increases to the concentrations of suspended solids where the potential for heightened sediment erosion / transport processes at the outlet of the crossing structure could result in an increase to downstream concentrations of suspended solids and reductions where the potential for augmented sedimentation processes upstream of the crossing structure could translate to a decrease in downstream concentrations of suspended solids). The geographic extent of the residual effect is expected to be limited to the Local Study Area, given that any changes to flow velocities, shear stresses, water levels, erosion–sedimentation processes, and concentrations of suspended solids are expected to be limited to short sections of the channel reach; however, the effect could be carried into the Local Study Area a short distance upstream or downstream of the crossing (in other words, greater than 120 metres). The likelihood of occurrence of the effect was assessed as possible (the effect may occur but is not likely). Based on the criteria discussed, the effect was not carried forward into the cumulative effects assessment.

9.3.2.3.5 Changes to Surface Water Quantity, Surface Water Quality and Sediment Quality due to Changes in Land Cover

9.3.2.3.5.1 Potential Effects

Construction of the right-of-way for the Community Access Road, as well as the construction of waterbody crossing foundations, temporary access roads and trails, temporary construction camps, turn-around areas, temporary laydown areas, and pits and quarries, could result in changes to surface water quantity, and surface water and sediment quality. For instance, construction of Project components could result in changes to the existing land cover, such as existing treed and peatland (Oji-Cree translation, maashkiigwabo) areas changed to bare ground and / or low-growing grasses and shrubs (in other words, due to construction of the right-of-way and temporary construction easements) or from treed and peatland areas to gravel or roofed surfaces (in other words, required access roads, temporary construction camps, turn-around areas, and temporary laydown areas).

The potential effect on surface water quantity as a result of the identified changes in land cover may include a local increase in runoff rates and / or runoff volumes from the various Project components and, in turn, an increase in streamflows, water levels, and erosion / sedimentation processes at nearby waterbodies (in other words, downstream receivers). By extension, the identified increase in streamflows with the potential for higher rates of sediment erosion / transport (all of which are tied to surface water quantity) may result in an associated increase to the concentrations of suspended solids and metal leaching (surface water quality and sediment quality) in these respective waterbodies.

In addition to the above, recreational off-road vehicle use may increase as a result of new access routes, temporary access roads and trails along Project areas. While the recreational access is currently unauthorized within the right-of-way, the potential for heightened unauthorized use of off-road vehicles within the right-of-way could further exacerbate the identified effects mentioned previously (for example, changes / disturbance to land cover with the potential for increased rates of runoff and associated erosion–sedimentation processes). Changes / disturbance due to unsanctioned off-road vehicle crossings (via fording) at waterbodies could result in effects at a channel scale (for example, disturbance and / or alterations to channel form / hydraulics with potential implications on flow conveyance, fish and fish habitat, and erosion–sedimentation processes) (Carrot River Valley Watershed Association n.d.; Guldin, 2004; Fisheries and Oceans Canada, n.d.).

9.3.2.3.5.2 Mitigation and Enhancement Measures

Marten Falls First Nation with the owner / operator will carefully manage runoff from disturbed areas to minimize or avoid potential changes in surface water quantity, surface water and sediment quality in receiving waterbodies. Mitigation measures include:

- Progressive revegetation of the right-of-way including revegetation using native seed or appropriate tree species, as appropriate;
- Use of existing access roads and trails for access, if available, to the extent practicable, to minimize new disturbance;
- Upgrading and constructing new access road in accordance with Ministry of Natural Resources' Environmental Guidelines for Access Roads and Water Crossing (Ministry of Natural Resources, 1990), which provides comprehensive guidance with respect to design and construction practices to mitigate environmental effects;

- Locating temporary construction camp facilities, temporary laydown areas, and other Project activities a minimum of 30 metres from the ordinary high-water mark of a waterbody;
- Progressively restoring temporary construction camps, temporary laydown areas, turn-around areas, and construction easements through construction to pre-existing compatible condition. Seeding will follow as close as possible to final cleanup and topsoil material replacement pending seasonal or weather conditions;
- Only materials cleared for acid rock drainage (in other words, non-potentially acid-generating rock) by a geochemical verification process will be used for the road surface to avoid acid rock drainage or associated metal leaching;
- Limiting use of off-road vehicles by Marten Falls First Nation and associated owner / operator during construction, noting that:
  - Off-road vehicle use will follow Fisheries and Oceans Canada's Code of Practice for Fording (Fisheries and Oceans Canada, 2022), Fisheries and Oceans Canada's All-Terrain Vehicle Guidance (Fisheries and Oceans Canada, 2010) and Ontario Regulation 316/03 under *Highway Traffic Act* (Government of Ontario, 1990g);
  - Inspecting and cleaning off-road vehicle before and after each use to prevent the spread of invasive species and to identify any fuel leaks or equipment damage; and
  - Avoidance of sensitive features and waterbody crossings to the extent practicable;
- Developing an Erosion and Sediment Control Plan and implementing control measures in accordance with the Ontario Provincial Standard Specifications for erosion and sediment control measures (Ministry of Transportation, 2021a, 2021b, 2021c). This includes provision of multistage drainage and sediment controls to collect and treat stormwater runoff from Project components, as appropriate. These controls may include diversion swales / dykes, collection ditches, silt fences, rock check dams, sediment traps / basins, level spreaders and riparian buffer strips. An Erosion and Sediment Control Plan will be provided in permit/approval applications for review by regulatory agencies, as applicable, in advance of construction activities; and
- Considering climate change factors in the selection and implementation of site-specific mitigation and enhancement measures, and increasing the inspection and monitoring frequency during and after the heavy rainfall and flooding events as outlined in Final Climate Adaption and Resiliency Technical Support Document (**Appendix Y**).

9.3.2.3.5.3 Predicted Residual Effects

Even with the effective implementation of the mitigation identified previously, changes to land cover, during construction, may result in a measurable increase in streamflows, water levels, and erosion–sedimentation processes at receiving waterbodies (due to associated increases in runoff rates and runoff volumes from the surrounding area). Changes to land cover may also result in an increase to the concentrations of suspended solids in receiving waterbodies (due to corresponding increase to streamflow and sediment erosion / transport processes). Further to this, the waterbodies generally have ephemeral or intermittent flow regimes with comparatively small catchment sizes, meaning that any increase in downstream flows and water levels at these waterbodies (mainly restricted to construction only) will be limited in spatial extent, recognizing that the anticipated effects will be largely indiscernible a short distance downstream of the crossing (as the ephemeral or intermittent water feature joins the broader surface water system and / or drains towards a progressively larger catchment area). Based on this, the Project–environment interaction during construction is carried forward to the residual effects characterization.

The potential changes in land cover during construction could result in changes to surface water quantity in the form of local increases in runoff rates and runoff volumes and, in turn, an increase in streamflows and / or water levels and erosion–sedimentation processes at receiving waterbodies. It could also result in potential changes to surface water and sediment quality at waterbodies through increased concentrations in suspended solids.

The residual effect is expected to be limited to the Construction Disturbance Area, as any increases to streamflows, water levels, erosion–sedimentation processes, and concentrations of suspended solids are likely limited to the area in the vicinity of the waterbody crossings and largely indiscernible a short distance downstream (in other words, less than 120 metres). The likelihood of occurrence of the residual effect was assessed as probable (the effect is likely to occur) during construction. Based on the criteria discussed, the effect was carried forward into the cumulative effects assessment.

9.3.2.3.6 Changes to Surface Water Quality from the Emission and Deposition of Airborne Particulate Matter to Nearby Waterbodies

9.3.2.3.6.1 Potential Effects

Air emissions from Project activities during construction could result in changes to surface water quality, if not mitigated. The emission and deposition of airborne particulate matter could result in increased concentrations of chemical constituents and

suspended solids in receiving waterbodies. during construction, particulate matter may be combustion products and / or fugitive dust generated from:

- Vehicle and equipment exhausts;
- Transportation of personnel, materials, and equipment on access roads and trails;
- Site preparation, earthworks, stockpiling, and demolition activities;
- Blasting activities;
- Concrete mixing on site and / or batch plants; and
- Site maintenance activities.

Air quality modelling was used to predict maximum ground-level concentrations of criteria air contaminant emissions during construction and operations. The methods and results for air quality modelling are presented in detail in the Final Atmospheric Environment Technical Support Document (**Appendix S**). Predicted concentrations of air criteria contaminants were compared to Canadian Ambient Air Quality Standards and / or Ontario Ambient Air Quality Criteria thresholds. During construction, threshold exceedances for the Project are predicted for particulate matter less than 2.5 micrometres and particulate matter less than 10 micrometres and total suspended particulate emissions. Threshold exceedances for dust emissions are predicted to be reached at less than 300 metres from the emission source. It should be noted that the air quality modelling incorporated conservative assumptions (in other words, using worst-case scenarios) to make sure that effects were not underestimated.

9.3.2.3.6.2 Mitigation and Enhancement Measures

Mitigation and enhancement measures planned to reduce the potential effects of airborne particulate matter on the surface water quality include:

- Mitigation measures as outlined in Section **9.5.4.1**; and
- Potential mitigation measures outlined in the Ontario Ministry of Transportation Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions for Provincial Transportation Projects (Ontario Ministry of Transportation, 2020) may be implemented, if feasible.

The effectiveness of mitigation measures will be evaluated during construction and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.3.2.3.6.3 Predicted Residual Effects

With the implementation of the mitigation measures, no residual effect on existing ambient concentration of particulate matter is expected during construction. To that end, no residual effect on surface water quality is expected as a result of the transport and delivery of airborne particulate matter.

9.3.2.3.7 Changes to Surface Water Quality from the Wash-Off of Trash, Domestic Waste, and Leachate at Waste Handling and Storage Facilities to Nearby Waterbodies

9.3.2.3.7.1 Potential Effects

Marten Falls First Nation with the owner / operator will establish and operate temporary waste handling and storage facilities at various locations during construction of the Community Access Road. The wash-off of trash, domestic waste (in other words, rainwater that has direct contact with the trash and may mobilize solids to downstream receivers), and leachate at these facilities to nearby waterbodies could result in changes to surface water quality relative to the existing conditions characterization. This potential effect has been noted as a concern by Indigenous communities including Fort Albany First Nation (Firelight Research Inc., 2024). Changes may include increases in concentrations of suspended solids (including floating debris) and chemical constituents in the receiving water.

9.3.2.3.7.2 Mitigation and Enhancement Measures

Marten Falls First Nation or the owner / operator will prepare and implement Waste Management Plans that describe the appropriate management of solid, liquid, and hazardous waste. Portable, secure, solid waste receptacles will be provided on work sites and at temporary laydown areas for the collection and temporary storage of domestic waste (for example, food scraps, paper, cardboard, bottles, and cans) and non-hazardous construction waste (for example, wiring, metal, and rubble). These receptacles will be located outside a minimum 30 metre buffer around waterbodies, to the extent practicable. The solid waste collected in these receptacles will be hauled periodically to waste handling and storage facilities located at the temporary construction camps.

Waste handling and storage facilities and waste recycling areas will be established at each temporary construction camp. These facilities will be located outside of the minimum 30 metre buffer zone around waterbodies to the extent practicable, provided with drainage controls and require personnel to be trained in industry standard waste management practices and procedures. Organic waste, recyclable materials, and

non-hazardous solid waste at waste handling and storage facilities will be separated and will be temporarily stored in appropriate containers. The waste will be transported to a waste disposal site designed to accept this type of waste and / or, whenever possible, the waste will be treated and disposed of at the site. Hazardous solid and liquid waste at waste handling and storage facilities will be temporarily stored in labelled, closed, compatible containers, with secondary containment if appropriate. Marten Falls First Nation or the owner / operator will also prepare and implement a Spill Prevention and Emergency Response Plan that describes specific measures that would be implemented if a spill occurred.

To avoid acid rock drainage or associated metal leaching, only the material that has been cleared for acid rock drainage (in other words, non-potentially acid-generating rock) through a geochemical verification process will be utilized for the road surface.

Hazardous, solid, and liquid waste will be managed and disposed of in compliance with Ontario Regulation 347 as amended by Ontario Regulation 105/24 under the *Environmental Protection Act* (Government of Ontario, 1990d).

Hazardous waste will be periodically transported by a registered hauler to an approved disposal site. The generation of hazardous waste is expected to be mainly associated with the servicing and maintenance of construction vehicles and equipment, although there may be other sources. Hazardous waste may include used oils, lubricants, and antifreeze as well as spent lubricating cartridges, oily rags, oily drums, fuel containers, batteries, and fluorescent bulbs.

9.3.2.3.7.3 Predicted Residual Effects

Based on the effective implementation of the mitigation described previously, coupled with other planning and strategies inherent to the design, no measurable increase to the concentrations of suspended solids and chemical constituents is expected in receiving waterbodies as a result of the wash-off of trash, domestic waste, and leachate at waste handling and storage facilities. The volume of trash or leachate-influenced water that collects near a solid waste handling and storage area is expected to be small, meaning that potential loading of suspended solids and chemical constituents to the broader surface water system is anticipated to be relatively inconsequential. In addition, the likelihood that this water is subsequently conveyed to a nearby waterbody is expected to be low, given the plan to maintain a 30 metre waterbody buffer and implement / maintain erosion and sediment controls. As such, this potential Project–environment interaction during construction is not carried forward to the residual effects characterization.

9.3.2.3.8 Changes to Surface Water Quality from the Wash-Off of Organic Debris from Vegetation Maintenance Activities to Adjacent Waterbodies

9.3.2.3.8.1 Potential Effects

During construction, vegetation maintenance activities will be required along the Community Access Road right-of-way to minimize the potential for vegetation to grow into, or fall onto, the road. Activities will generally include mechanical and / or manual methods to manage vegetation to an appropriate height. Mechanical vegetation maintenance activities along the right-of-way could result in changes to surface water quality if not mitigated. For instance, potential effects may include the transport of organic debris to nearby waterbodies, with the opportunity for increased concentrations of suspended solids in the receiving water.

9.3.2.3.8.2 Mitigation and Enhancement Measures

To minimize potential effects on waterbodies, a riparian buffer of 30 metres around waterbodies will be maintained for the right-of-way, unless required for access to install waterbody crossing structures, in which case a 10 metres wide right-of-way for equipment access will be cleared within right-of-way. Temporary access roads will be cleared and will be 10 metres wide.

Vegetation clearing will consist of cutting tree trunks parallel to and within 15 centimetres of the ground or lower as well as the removal of shrubs, debris, and other such materials. Grubbing may be required along some parts of the right-of-way. Vegetation will be largely removed by mechanical means, except within 10 metres of a watercourse or wetland. In these areas, vegetation will be removed manually, using chain saws and other hand-held equipment, while leaving the undergrowth and duff layer undisturbed to prevent erosion.

The temporary disturbance within the 30 metres buffer up to 10 metres from a waterbody will have potential to effects surface water during the construction time period. Vegetation clearing or disturbed areas within the 30 metre buffer will be provided with appropriate erosion and sediment controls in accordance with the Ontario Provincial Standard Specifications for erosion and sediment control measures (Ministry of Transportation, 2021a, 2021b, 2021c). After the construction time period, the 30 metre riparian buffer is expected to rehabilitate within a 2-year timeframe and will be maintained through operations. Removed vegetation will be immediately relocated outside a waterbody buffer zone (30 metre) and above its high-water mark.

Chemical vegetation maintenance will not involve the use of herbicides or pesticides at any stage of the Community Access Road construction. All vegetation maintenance will be carried out through mechanical removal or the use of environmentally friendly products in accordance with the Ministry of Transportation requirements.

9.3.2.3.8.3 Predicted Residual Effects

Based on the effective implementation of the mitigation measures described previously, coupled with other planning and strategies inherent to the design, no measurable changes to the concentrations of suspended solids are expected at receiving waterbodies as a result of wash-off of organic debris from mechanical vegetation maintenance activities during construction. The volume of water that could be potentially affected by clearing activities is expected to be small, meaning that potential loading of suspended solids including organic debris to the broader surface water system is anticipated to be relatively inconsequential. Further to this, the likelihood that this water is subsequently conveyed to a nearby waterbody is expected to be low, given the plans to maintain buffer zones of 30 metres around waterbodies, and limit clearing of riparian vegetation to the extent practicable and to the requirement of the Community Access Road and alignment clearing width only. Clearing at waterbody crossings along the 100 metre wide Community Access Road right-of-way will generally be limited to 10 metres for equipment access to waterbody crossing structures (for example, temporary bridges). Vegetation clearing or disturbed areas within the 30 metres buffer will be provided with appropriate erosion and sediment controls. As such, this potential Project–environment interaction during construction is not carried forward to the residual effects characterization.

9.3.2.3.9 Changes to Surface Water Quality and Sediment Quality from the Wash-Off of Organic Debris to Nearby Waterbodies, and / or Increased Rates of Erosion in Disturbed and Exposed Areas with Sediment Transport and Delivery to Adjacent Waterbodies

9.3.2.3.9.1 Potential Effects

Site preparation, earthworks, and stockpiling activities during construction could result in changes to surface water quality and sediment quality, recognizing that activities involving vegetation clearing and / or ground disturbance or exposure may result in increased rates of erosion, transport, and delivery of organic debris and sediments to nearby waterbodies. This in turn may result in an increase to the concentrations of suspended solids in receiving waterbodies, noting that suspended solids will be used as an indicator to assess other chemical constituents (including methylmercury and other metals). Potential effects including increased rates of erosion were noted as a concern by Indigenous communities including Marten Falls First Nation and Weenusk First

Nation (Marten Falls First Nation, 2022b, MNP LPP, 2024b). This includes concerns related to effects to streams / surface water quality (in other words, increased turbidity) (Marten Falls First Nation, 2022b).

Details of site preparation, earthworks, and stockpiling activities follow:

- The preparation of sites for the Community Access Road right-of-way and waterbody crossings will include vegetation removal, grubbing, stripping of topsoil, removal of unsuitable subsoil, and rough grading;
- The right-of-way preparation will be carried out over a typical 60 metre wide area, noting that the total width of right-of-way is approximately 100 metres. There may be additional right-of-way easement required at major waterbody crossings. Vegetation, including timber and shrubs, will be removed along the right-of-way. In addition, diseased or damaged trees located at the edge of the right-of-way will be removed;
- Temporary access roads and trails and temporary workspaces will also be cleared of vegetation, grubbed, stripped of topsoil and unsuitable subsoil (where required), and roughly graded;
- Earthworks will include excavation, fill, backfill, and final grading activities. Excavations along the right-of-way may include blasting, drilling and shallow digs. Excavation and fill for access road upgrades and construction will be required along the right-of-way to provide appropriate grades, widths, and travel surfaces (road subbase and base courses) for the safe transportation of personnel, materials and equipment;
- Fording of watercourses at crossing locations with clearing and crossing installation equipment may be necessary to facilitate installation of crossing structures;
- Earthworks for the installation of waterbody crossings will be required to provide the structural stability for bridges and culverts and to provide adequate widths and travel surfaces for vehicular traffic. Earthworks at waterbody crossings will include removal of unsuitable subsoil, excavation and placement of bedding and / or backfill materials for bridge foundations and culverts and fill to construct road embankments and travel surfaces; and
- Stockpiling will consist of the short-term storage of topsoil and unsuitable subsoil removed during site preparation as well as excavated materials (rock, soil) and required aggregates (sand, gravel, crushed rock) for the construction of the Community Access Road, waterbody crossings, and their foundations.

9.3.2.3.9.2 Mitigation and Enhancement Measures

The preparation of work sites will include vegetation removal, grubbing, stripping of topsoil and removal of unsuitable subsoil, and rough grading. The Community Access Road right-of-way preparation will be carried out in accordance with standard practices and procedures and will involve the removal of incompatible vegetation. Removal will consist of cutting trees within 15 centimetres of the root collar or lower as well as the removal of shrubs, debris, and other such materials. Diseased or damaged trees located outside of the right-of-way that have potential to fall onto the Community Access Road right-of-way or waterbody crossing structures will also be removed.

Clearing of the right-of-way will take the following factors into consideration:

- Widths of watercourses;
- Location of wetlands;
- Locations of known archaeological and heritage sites;
- Areas of timber storage and the method of cutting and storing timber; and
- Required buffer zones (for example, for watercourses).

Vegetation removal will take into consideration 30 metre buffer zones around waterbodies, and clearing of riparian vegetation will be restricted to the extent feasible. Vegetation removal at waterbody crossings along the right-of-way will generally be limited to a 10 metre wide Community Access Road right-of-way for equipment access to waterbody crossing structures (for example, temporary bridges). Cleared vegetation will be immediately removed outside a waterbody buffer zone and above its high-water mark where this is identified to extend beyond the buffer zone.

Marten Falls First Nation with the owner / operator will work with applicable Forest Resource Licence or Sustainable Forest Licence holders and Indigenous communities to manage merchantable timber cleared by the Project. Timber, chips, and other organic debris will be stored outside the buffer zone and above the high-water mark of any nearby waterbody. Slash and debris will be chipped or burned on site with other organic debris in compliance with Ontario Regulation 207/96 as amended by Ontario Regulation 94/18 under the *Forest Fires Prevention Act* (Government of Ontario, 1990e).

Earthworks will include excavation, fill, backfill, and final grading activities. Excavations for waterbody crossing foundations along the right-of-way may include blasting, drilling and shallow digs. Excavation and fill for the Community Access Road construction will be required to provide appropriate grades, widths, and travel surfaces (in other words, road subbase and base courses) for the safe transportation of personnel, materials, and

equipment. Earthworks for the installation of waterbody crossing structures will be required to provide the structural stability for bridges and culverts, and to provide adequate widths and travel surfaces for vehicular traffic.

Marten Falls First Nation or the owner / operator will develop and implement an Erosion and Sediment Control Plan. The Erosion and Sediment Control Plan will include appropriate locations of selected control measures, scheduling information for the installation of erosion and sediment control practices, and details of the assigned responsibilities for implementation, operation, modification, inspection, and maintenance. Erosion and sediment control measures will be installed and maintained in accordance with the Ontario Provincial Standard Specifications for erosion and sediment control measures (Ministry of Transportation, 2021a, 2021b, 2021c). All aggregate pits and quarries will be located a minimum of 120 metres away from the ordinary high-water mark of a waterbody, where possible. The aggregate pits and quarries will follow the guidelines and associated conditions / requirements of the approved permits, including development of a rehabilitation plan, outlined in the Aggregate Permits on Crown Lands for Pits and Quarries above Water (Ministry of Natural Resources and Forestry, 2014) and the Forest Management Planning Manual (Ministry of Natural Resources and Forestry, 2017).

Stockpiling will consist of the short-term storage of topsoil and unsuitable subsoil removed during site preparation as well as excavated materials (rock, subsoil) and required aggregates (sand, gravel, crushed rock) for the construction of waterbody crossing foundations and the Community Access Road and the installation of waterbody crossings.

Sedimentation in the receiving environment will be controlled by directing sediment-laden water to various temporary storage and settlement features (in other words, sumps, settling ponds, or catch basins) prior to discharge. Alternately, where appropriate, the sediment-laden water will be directed to drain / filter through low gradient, well-vegetated areas away from watercourses (in other words, using pumps and hoses).

Erosion and sediment control measures will be incorporated prior to construction activities or immediately after disturbance on site-specific cases throughout the Project to avoid introduction of sediment to the environment, and, as part of this, to stabilize drifting soils or loss of topsoil, as practicable.

To limit the disturbance caused by new construction, Marten Falls First Nation with the owner / operator will use the existing roads and trails, if available, for access, to the extent practicable. In addition, temporary laydown areas will be constructed on existing

disturbed areas with appropriate land use designations, where possible. Additional contingency measures will be implemented as appropriate in the event of excessive rain, wet weather or flood-like conditions (when the planned activity could cause significant damage to soils, such as rutting by traffic through the topsoil, soil structure damage during soil handling, or compaction and associated pulverization of topsoil structure damage due to heavy traffic). These measures include:

- Rescheduling work or reducing / detouring traffic in areas where soils are considered to be excessively wet;
- Restricting construction traffic, where feasible, to equipment with low-ground pressure tires or wide pad tracks;
- During excessively wet conditions, work only in non-problem areas, such as well-drained soil or well-sodded lands, until conditions improve;
- Limiting vehicle access through soft / wet areas to periods when frozen conditions occur (in other words, early morning / evening) and have crews park in a stable area and walk to onsite equipment if feasible;
- Installing access or rig matting in problem areas to protect soils; and
- If necessary, suspending work until soils dry out or appropriate site-specific mitigation can be used to prevent soil disturbance.

The Community Access Road and waterbody crossings will be constructed in accordance with Ministry of Natural Resources' Environmental Guidelines for Access Roads and Water Crossings (Ministry of Natural Resources, 1990) to the extent practicable. Where applicable, waterbody crossings will also be constructed in compliance with Ministry of Natural Resources approvals issued under Ontario Regulation 239/13 under the *Public Lands Act* (Government of Ontario, 1990h) and / or Ontario Regulation 454/96 under the *Lakes and Rivers Improvement Act* (Government of Ontario, 1990f). In accordance with these approvals, Marten Falls First Nation with the owner / operator will be required to complete construction along waterbody shorelines as well as in-water works in a manner that minimizes adverse environmental effects such as increased flooding, waterbody and shoreline erosion, and sediment loads.

9.3.2.3.9.3 Predicted Residual Effects

Even with the effective implementation of the mitigation measures identified previously, measurable changes to surface water quality (in other words, residual effects) may occur due to the wash-off of organic debris and / or increased rates of sediment erosion / transport to nearby waterbodies as part of site preparation, earthworks, stockpiling activities, and construction of the Community Access Road and waterbody crossings

during construction of the Project. Therefore, this Project–environment interaction during construction is carried forward to the residual effects characterization.

Site preparation, earthworks, and stockpiling activities during construction could result in changes to surface water and sediment quality, recognizing that activities involving vegetation clearing and / or ground disturbance or exposure may result in increased rates of erosion, transport, and delivery of organic debris and sediments to receiving waterbodies and, in turn, increased concentrations of suspended solids. The likelihood of occurrence of the residual effect was assessed as probable (the effect is likely to occur). Based on the criteria discussed, the effect was carried forward into the cumulative effects assessment.

9.3.2.3.10 Changes to Surface Water Quality and Sediment Quality from the Wash-Off of Accidental Spills and Leaks to Nearby Waterbodies

9.3.2.3.10.1 Potential Effects

Accidental spills and leaks from the transportation, storage, and handling of hazardous materials and the operation of vehicles and equipment during construction have the potential to change surface water and sediment quality. Spills and leaks could be washed off into nearby waterbodies during a runoff event and, if occurring in high enough volumes, could change the chemical constituents in receiving waters and affect surface water and sediment quality. These effects were also noted as a concern within the community of Marten Falls First Nation, Kashechewan First Nation, Fort Albany First Nation, Weenusk First Nation, and Aroland First Nation (Firelight Research Inc., 2024; MNP LPP 2024a; MNP LPP, 2024b; Marten Falls First Nation, 2022a; 2022b; 2023; Shared Value Solutions, 2024).. Specifically, the community highlighted pollution concerns (in other words, accidental spills, leaks, application of road salt) related to effects on water quality as a result of additional traffic to the area (Marten Falls First Nation, 2022a; 2022b; 2023). Members of Kashechewan First Nation highlighted concerns relating to accidental spills and leaks and associated contamination of surface water features due to previous experiences with Victor Diamond Mine (MNP LPP, 2024a). Additionally, Aroland First Nation also highlighted concerns related to the potential for accidents along the road resulting in contamination of the waterways and surrounding environment in the event of a truck overturning, sliding off the road in poor weather, or contamination spills. One interview participant spoke of their previous experience with seeing contamination from oil tanks and garbage out on the land, and was concerned that this could happen again if there is an accident on the road close to the water. While they noted the contamination they saw was cleaned up with bales of hay, they also emphasized that doing more to prevent these incidents is necessary (Shared Value Solutions, 2024).

Hazardous materials that may be handled and stored during construction include:

- Fuels and batteries for vehicle and equipment operation;
- Oils, grease, and liquid chemicals for vehicle and equipment maintenance;
- Explosives for blasting activities; and,
- Pesticides, sand and dust suppressant for maintenance activities.

9.3.2.3.10.2 Mitigation and Enhancement Measures

The transportation, storage, and handling of fuels during construction will be in compliance with Canada's *Transportation of Dangerous Goods Act* (Government of Canada, 1992) and the *Technical Standards and Safety Act* (Government of Ontario, 2000). Fuels will be transported to temporary construction camps and temporary laydown areas in tanker trucks, drums, or other approved containers and stored in aboveground storage tanks featuring secondary containment. Note that at the onset of the Community Access Road, fuel will be transported by aircraft to the fuel storage facility. Vehicles used for transportation will be licensed and maintained according to safety requirements. The aboveground storage tanks will meet the requirements of the Canadian Council of Ministers of the Environment (Canadian Council of Ministers of the Environment, 2003). Transportation of fuel on winter roads will only take place in safe ice conditions (for example, open roads where ice thickness has been measured). Marten Falls First Nation or the owner / operator will prepare Waste Management Plans that describe the appropriate management of solid, liquid, and hazardous waste. Drums and containers for disposal will be transported offsite and disposed at a waste disposal site designed to accept this type of waste.

Refuelling, service, and maintenance of vehicles and equipment will generally be carried out in designated areas at temporary construction camps and temporary laydown areas located a minimum of 120 metres from waterbodies to the extent possible. Designated refuelling, service, and maintenance areas will have adequate lighting available to help prevent the potential for spills during hours when daylight is not available. These areas will be designed and constructed to collect and contain minor leaks and spills. For example, spill containment measures may consist of low permeability liners, sloped appropriately, and buried in the ground, portable berms (for example, insta-berms) or concrete pads with perimeter drainage control. Drainage will be passed through an oil-water separator to remove hydrocarbons prior to its release to a vegetated area. If refuelling within 120 metres of a waterbody cannot be avoided, enhanced spill containment measures, including but not limited to the above mentioned measures and use of drip-trays and automatic shut-off nozzles, avoiding refuelling in riparian areas together with implementation of Spill and Emergency Response Plan, will

be used. In the event that refuelling, servicing and maintenance are required in the field, 120 metre buffer will be respected to the extent possible. There may be locations where this is not possible due to the prevalence of wetlands; however, in these locations enhanced spill containment measures will be used.

Marten Falls First Nation with the owner / operator will prepare and implement a Spill Prevention and Emergency Response Plan in accordance with Part X of the *Environmental Protection Act* and Ontario Regulation 675/98 under *Environmental Protection Act* (Government of Ontario, 1990d). The Plan will describe specific measures that would be implemented if a spill occurred. Spill Prevention and Emergency Response Plan will be provided in permit/approval applications for review by regulatory agencies, as applicable, in advance of construction activities. Spill response kits will be provided in fuel and hazardous materials storage and handling facilities at temporary construction camps and temporary laydown areas, in onsite work areas, and / or in vehicles and equipment, and personnel will be trained in spill response practices and procedures. Spills and leaks will be contained and cleaned up as soon as possible following incidents.

It is noted that a sewage Environmental Compliance Approval may be required for the management of stormwater drainage from the storage areas / facilities. In the event of a spill, it is anticipated that the water will be collected and transported in trucks to a treatment facility for disposal (similar to the management of wash water from vehicle and equipment).

9.3.2.3.10.3 Predicted Residual Effects

The wash-off of fluids from accidental spills and leaks may result in an increase to the concentrations of chemical constituents in receiving waterbodies. However, leaks or spills are considered avoidable with good planning, adequate design, and proper emergency response. Further to this, the frequency, spatial extent, and severity of accidental spills or leaks during the Construction of the Community Access Road are anticipated to be minimized with the effective implementation of the mitigation and enhancement measures identified previously. However, it is recognized that, even with the best planning and the implementation of mitigation measures, the potential exists for accidents and malfunctions. As such, measurable changes (in other words, residual effects) to surface water and sediment quality in the form of increase to the concentrations of chemical constituents in receiving waterbodies could occur in the event of the wash-off from accidental spills or leaks to nearby waterbodies. Therefore, this Project–environment interaction during construction is carried forward to the residual effects characterization.

Accidental spills and leaks from the transportation, storage, and handling of hazardous materials during construction and the operation of vehicles and equipment during construction, could be washed off into nearby waterbodies during a runoff event or when using winter access roads and, if occurring in high enough volumes, could change the chemical constituents in receiving waters and affect surface water and sediment quality. The likelihood of occurrence of the residual effect was assessed as possible (the effect may occur but is not likely), given that the implementation of the detailed Spill Prevention and Emergency Response Plan, which will be developed with consideration for applicable regulations and guidelines for spill management and clean-up, is expected to minimize opportunities for the wash-off of spills and leaks from relevant Project activities to enter nearby waterbodies. Based on the criteria discussed, the effect was not carried forward into the cumulative effects assessment.

9.3.2.3.11 Changes to Surface Water Quality and Sediment Quality from the Wash-Off of Explosive Spills and Residues from Blasting Activities to Nearby Waterbodies

9.3.2.3.11.1 Potential Effects

During construction, blasting may be required for aggregate extraction from pits and quarries and to facilitate excavation, supporting access roads (both temporary and permanent), and waterbody crossing structure foundations where other options are not feasible. The blasting agents employed for structure foundation works can be accidentally released during storage, transfer, or loading. These blasting activities may result in changes to surface water and sediment quality, recognizing that explosives spills and residues could be washed off into nearby waterbodies during a runoff event and, if occurring in high enough volumes, may result in changes to the concentrations of chemical constituents in receiving waters. A waterbody may be influenced by these potential effects only if there is need to employ blasting in close proximity to the feature. Therefore, it is anticipated that only a limited number of waterbodies may be potentially affected.

9.3.2.3.11.2 Mitigation and Enhancement Measures

The transportation and storage of explosives will be in compliance with the *Explosives Act* (Government of Canada, 1985) and the *Transportation of Dangerous Goods Act* (Government of Canada, 1992), where applicable, recognizing that explosives will be transported in vehicles with valid Natural Resources Canada permits and stored in properly sited and secured magazines licensed by Natural Resources Canada. Blasting activities in aggregate pits and quarries will abide by the hours of operation and any blasting restrictions on the aggregate permit / licence issued under *Aggregate*

Resources Act (Government of Ontario, 1990i), where applicable, to help mitigate the effects on the environment.

Ammonium nitrate and fuel oil will not be used. Explosives will be in emulsion form (ammonium nitrate emulsion) to mitigate potential dissolution and poor explosive performance in the presence of water, noting that emulsion type explosives are highly water resistant.

Marten Falls First Nation or the owner / operator will prepare and implement a Blasting and Communication Management Plan that describes specific measures that would be implemented if blasting is required. Marten Falls First Nation will employ only qualified persons with appropriate training and experience to carry out the transportation and handling of explosives. Good housekeeping practices will be observed during loading of explosives with a plan to immediately clean up spills and undetonated explosives. Proper loading techniques will be implemented to minimize the use of excess explosives and the potential for spillage. Waste rock (from the construction of waterbody crossing foundations) and aggregates (from quarrying activities) are expected to be free of blasting residues. The Environmental Inspector will monitor blasting operations for adherence to the Blasting and Communication Management Plan.

Blasting wastes may include discarded explosives and packaging containing chemical residues (classified as hazardous wastes) as well as waste rock. Discarded explosives will either be detonated on site as part of the blast with explosives packaging daily or temporarily stored in the explosives magazine and returned to the explosives' distributor.

9.3.2.3.11.3 Predicted Residual Effects

Measurable changes to surface water quality (in other words, residual effects) at nearby waterbodies may occur due to the wash-off of explosives spills and residues from blasting activities, especially at locations where structural foundation work is required, even with the effective implementation of the mitigation measures identified previously. Therefore, this Project–environment interaction during construction is carried forward to the residual effects characterization.

Blasting activities may result in changes to surface water and sediment quality, recognizing that explosives spills and residues could be washed off into nearby waterbodies during a runoff event and, if occurring in high enough volumes, may result in an increase to the concentrations of chemical constituents in receiving waters. A waterbody may be influenced by these potential effects only if there is need to employ blasting in close proximity to the feature. Therefore, it is anticipated that only a limited number of waterbodies may be affected. The likelihood of occurrence of the effect was

assessed as possible (the effect may occur but is not likely), given that the implementation of the detailed Blasting and Communication Management Plan, which will be developed with consideration for applicable regulations and guidelines for transportation, handling, storage, and use of explosives, is expected to minimize opportunities for the wash-off of explosives spills and residues from blasting activities to enter nearby waterbodies. Based on the criteria discussed, the effect was not carried forward into the cumulative effects assessment.

9.3.2.4 Residual Effects – Operations Phase

9.3.2.4.1 Changes to Surface Water Quantity, Surface Water Quality, and Sediment Quality due to Changes in Channel Hydraulics at Waterbody Crossings

9.3.2.4.1.1 Potential Effects

During operations of the Community Access Road problems resulting in changes to the channel hydraulics are expected to occur at waterbody crossing structures and surrounding areas. Common problems which may be encountered during operation of waterbody crossings include:

- Scour or erosion around or under waterbody crossings;
- Debris, ice or beaver activity blocking culvert inlet;
- Debris or beaver activity constricting the waterway opening;
- Damage or decay of structural component of a waterbody crossing structure; and
- Unstable embankment or soil around waterbody crossings.

To support the safe operation of waterbody crossing structures as per the design and to meet environmental protection requirements, waterbody crossings are expected to undergo maintenance during their operational life. Maintenance of waterbody crossing structures may require one or more of the following alterations / modifications:

- Repair or complete replacement of defective / damaged structural component of a waterbody crossings;
- Stabilization of surrounding areas to stop scour and erosion;
- Removal of debris, ice, or beaver activity reducing the discharge capacity of waterbody crossing and / or obstructions preventing fish passage; and
- Reinstallation / reconstruction if problem cannot be fixed using maintenance techniques or where problems persist.

The disturbances / alterations to channel geometry due to common problems encountered during the operational life and / or maintenance activities may result in a localized increase or reduction to flow velocities, shear stresses, water levels, and erosion–sedimentation processes at locations upstream or downstream of the crossing.

9.3.2.4.1.2 Mitigation and Enhancement Measures

Mitigation and enhancement measures to reduce the potential effects on cross-section hydraulics during operations will involve the following:

- Monitoring permanent culverts in accordance with the Culvert Inspection Guide (Ministry of Transportation, 2022) to identify and remove blockages (for example, ice, woody debris), as needed, that could otherwise lead to scouring and effects on channel morphology and fish habitat and potentially interfere with fish passage;
- Monitoring and inspecting new permanent waterbody crossing structures (bridge) and roadside drainage features for physical function and condition in accordance with the Ontario Structure Inspection Manual (Ministry of Transportation, 2018);
- Maintaining waterbody crossings in accordance with permits and approvals through Fisheries and Oceans Canada and Ministry of Natural Resources, as applicable;
- Increasing the inspection and monitoring frequency during and after the heavy rainfall and flooding events as outlined in Final Climate Adaption and Resiliency Technical Support Document (**Appendix Y**);
- Fixing the problems identified during monitoring and inspection immediately to prevent any further damage to the channel hydraulics, aquatic habitat and the fisheries resources;
- Minimizing in-water works and limiting the timing to avoid period of fish spawning, incubation and migration;
- Implementing appropriate erosion and sediment control measures in accordance with the Ontario Provincial Standard Specifications for erosion and sediment control measures (Ministry of Transportation, 2021a, 2021b, 2021c) prior to commencement of repair work;
- Restoring and re-vegetating disturbed areas to mitigate erosion and sediment entry to waterbodies;
- Repairing and reinforcing waterbody crossings in a manner that prevents waterbody crossing structure materials from entering waterbodies;

- Preventing entry of waste materials to be stabilized or disposed of in waterbodies; and
- Reconstructing waterbody crossings in compliance with Ministry of Natural Resources approvals, when necessary.

9.3.2.4.1.3 Predicted Residual Effects

Even with the effective implementation of the mitigation and enhancement measures identified previously, the installation of waterbody crossings along the right-of-way of the Community Access Road and support access roads may result in measurable changes (in other words, residual effects) to channel hydraulics at some crossing locations, with the potential for changes in surface water quantity (in other words, localized increase or reduction to flow velocities, shear stresses, water levels, and erosion–sedimentation processes at locations upstream or downstream of the crossing) and quality (increase or reduction to the concentrations of suspended solids at locations downstream of the crossings due to the corresponding changes to erosion–sedimentation processes in the vicinity of the crossing). Therefore, this Project–environment interaction during operations is carried forward to the residual effects.

Project activities may result in changes to channel hydraulics at waterbody crossings with the potential for a localized increase or reduction in flow velocities, shear stresses, water levels, and erosion–sedimentation processes at locations upstream or downstream of the crossing. The effect was assessed as negligible in magnitude as the crossings will be monitored and inspected regularly and restored to design conditions immediately after identification of a problem to minimize effects on channel hydraulics. The residual effect at permanent waterbody crossing structures is expected to be short-term in duration because the effect is not expected to persist after the maintenance of the affected crossing, noting that the maintenance of affected crossing are expected to be planned immediately after identification of a problem during routine monitoring and inspection. The residual effect was assessed to be infrequent, largely limited to infrequent, short-term runoff events (in other words, minor to major floods), rather than typical flow conditions. The residual effect is predicted to be reversible because maintenance activities are expected to restore the crossings to the design conditions. The geographic extent of the residual effect is expected to be limited to the Local Study Area, given that any changes to flow velocities, shear stresses, water levels, erosion–sedimentation processes, and concentrations of suspended solids are expected to be limited to short sections of the channel reach. The likelihood of occurrence of the effect was assessed as possible (the effect may occur but is not likely). Based on the criteria discussed, the effect was not carried forward into the cumulative effects assessment.

9.3.2.4.2 Changes to Surface Water Quantity, Surface Water Quality and Sediment Quality due to Changes in Land Cover

9.3.2.4.2.1 Potential Effects

Project activities during operations, although expected to be limited in scale and tied to discrete locations, may also result in potential changes to surface water quantity and surface water and sediment quality. For example, changes to the existing land cover (for example, existing treed and peatland areas changed to bare ground and / or low-growing grasses) due to maintenance activities could result changes to flowrates, water levels, erosion / sedimentation processes. Maintenance activities requiring changes to land cover may include:

- Repair of unstable foreslope or backslope of ditches, eroded roadbed and / or foreslopes, loose material and debris on the right-of-way creating hazard, erodible soil along the road shoulders, resurfacing and regrading of the Community Access Road, when necessary;
- Repair / replacement of waterbody crossings, stabilization of surrounding areas and / or removal of ice, debris, fallen tress, or beaver dams; and
- Clearing / establishing temporary access roads, turn-around areas, and temporary laydown areas for the maintenance activities.

In addition to above, recreational off-road vehicle usage because of new access route, temporary access roads and trails along Project areas is also expected to persist during Operations. The heightened unauthorized use of off-road vehicles within the right-of-way, as discussed previously, could further exacerbate the identified effects (for example, changes / disturbance to land cover with the potential for increased rates of runoff and associated erosion–sedimentation processes) and lead to changes / disturbance causing effects at a channel scale (Carrot River Valley Watershed Association n.d.; Guldin, 2004; Fisheries and Oceans Canada, n.d.).

9.3.2.4.2.2 Mitigation and Enhancement Measures

To minimize or avoid potential effects in receiving waterbodies due to change in land cover during operations, mitigation and enhancement measures will include the following:

- Minimizing the disturbance to existing land cover during maintenance works;
- Restoring and re-vegetating disturbed areas to mitigate changes to runoff rates and erosion / sedimentation processes;

- Making use of existing access roads and trails for access, if available, to the extent practicable, to minimize new disturbance;
- Upgrading new access road in accordance with Ministry of Natural Resources' Environmental Guidelines for Access Roads and Water Crossing (Ministry of Natural Resources, 1990), which provides comprehensive guidance with respect to design and construction practices to mitigate environmental effects;
- Using materials cleared for acid rock drainage (in other words, non-potentially acid-generating rock) by a geochemical verification process for the road resurfacing, when necessary, to avoid acid rock drainage or associated metal leaching;
- Inspecting and cleaning off-road vehicles before and after each use to prevent the spread of invasive species and to identify any fuel leaks or equipment damage; and
- Implementing appropriate erosion and sediment control measures in accordance with the Ontario Provincial Standard Specifications for erosion and sediment control measures (Ministry of Transportation, 2021a, 2021b, 2021c) prior to commencement of maintenance work.
- Considering climate change factors in the selection and implementation of site-specific mitigation and enhancement measures, and increasing the inspection and monitoring frequency during and after the heavy rainfall and flooding events as outlined in Final Climate Adaption and Resiliency Technical Support Document (**Appendix Y**).

9.3.2.4.2.3 Predicted Residual Effects

Even with the effective implementation of the mitigation identified previously, changes to land cover, during operations, may result in a measurable increase in streamflows, water levels, and erosion–sedimentation processes at receiving waterbodies (due to associated increases in runoff rates and runoff volumes from the surrounding area). Changes to land cover may also result in an increase to the concentrations of suspended solids in receiving waterbodies (due to corresponding increase to streamflow and sediment erosion / transport processes). The results of the assessment demonstrated that the magnitude of the effect is expected to be negligible at most of the assessment points, given that the percentage of disturbed area relative to the overall catchment is expected to be 5 percent or less at the majority of locations. For the locations where the proportion of total disturbed area to total catchment area will be higher than 5 percent, it was shown that the land cover change is primarily dominated by temporary disturbed areas and the contribution of permanent disturbed areas is less

than 5 percent. Further to this, the waterbodies generally have ephemeral or intermittent flow regimes with comparatively small catchment sizes, meaning that any increase in downstream flows and water levels at these waterbodies (mainly restricted to construction only) will be limited in spatial extent, recognizing that the anticipated effects will be largely indiscernible a short distance downstream of the crossing (as the ephemeral or intermittent water feature joins the broader surface water system and / or drains towards a progressively larger catchment area). Based on this, the Project–environment interaction during operations is carried forward to the residual effects characterization.

The potential changes in land cover during operations, although expected to be limited in scale and tied to discrete locations, could also result in changes to surface water quantity (in the form of local increases in runoff rates and runoff volumes and, in turn, an increase in streamflows and / or water levels and erosion–sedimentation processes at receiving waterbodies), surface water and sediment quality at waterbodies (through increased concentrations in suspended solids). The likelihood of occurrence of the residual effect during operations was assessed as possible (the effect may occur but is not likely). Based on the criteria discussed, the effect was not carried forward into the cumulative effects assessment

9.3.2.4.3 Changes to Surface Water Quality from the Emission and Deposition of Airborne Particulate Matter to Nearby Waterbodies

9.3.2.4.3.1 Potential Effects

During operations the Community Access Road will be available for public use. Fugitive dust emissions are expected to be produced by the road traffic on the Community Access Road, in addition to road maintenance activities. Air emissions from the road traffic and maintenance activities and deposition of airborne particulate matter in nearby waterbodies could result in changes to surface water quality, if not mitigated.

During operations, particulate matter may be combustion products and / or fugitive dust generated from:

- Vehicular traffic on Community Access Road;
- Road maintenance activities including use of vehicles and equipment, transportation of personnels, material and equipment, and site preparation and earthwork.

Air quality modelling was used to predict maximum ground-level concentrations of criteria air contaminant emissions during construction and operations. The methods and results for air quality modelling are presented in detail in the Atmospheric Environment

Technical Support Document (**Appendix S**). Predicted concentrations of air criteria contaminants were compared to Canadian Ambient Air Quality Standards and / or Ontario Ambient Air Quality Criteria thresholds. During operations, threshold exceedances for the Project are predicted for Particulate Matter 2.5, Particulate Matter 10 and Total Suspended Particulate. The Particulate Matter 2.5 levels are predicted to reach the 24-hour and annual criteria thresholds at 115 metres and 134 metres from the road, respectively. Levels of Particulate Matter 10 are predicted to reach the 24-hour threshold at 1,986 metres from the road. Emissions of Total Suspended Particulate are predicted to reach the 24-hour and annual thresholds at 3,004 metres and 899 metres from the road, respectively.

9.3.2.4.3.2 Mitigation and Enhancement Measures

Mitigation and enhancement measures planned to reduce the potential effects of airborne particulate matter on the surface water quality include:

- Mitigation measures as outlined in Section **9.5.4.1;** and
- Potential mitigation measures outlined in the Ontario Ministry of Transportation Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions for Provincial Transportation Projects (Ontario Ministry of Transportation, 2020) may be implemented, if feasible.

9.3.2.4.3.3 Predicted Residual Effects

The results of air quality modelling (Dillon, 2024a) predicted dust emissions to be higher during operations than construction. Because, during construction, Marten Fall First Nation and / or their contactors are expected to have better control over mitigation measures and implementation of Adaptive Management Plan, mitigation measures to limit dust emissions are predicted to be more effective during construction compared to operations.

With the implementation of the mitigation measures (also summarized in **Table 9.3-4**), no residual effect on existing ambient concentration of particulate matter is expected during construction. To that end, no residual effect on surface water quality is expected as a result of the transport and delivery of airborne particulate matter. However, during operations, dust dispersion and potential deposition are expected to effect surface water quality of nearby waterbodies, if not mitigated. There are currently no plans to decommission the Project and dust deposition is expected over the life of the Project. Therefore, this effect (in other words, increase to the concentrations of chemical constituents and suspended solids in receiving waterbodies from the transport and delivery of airborne particulate matter) during operations only is carried forward to the residual effects characterization.

Air emissions of particulate matter are expected due to vehicular traffic on the Community Access Road, in addition to maintenance activities and the resulting deposition of the airborne particulate matter could result in increased concentrations of chemical constituents and suspended solids in receiving waterbodies, if not mitigated. The likelihood of occurrence of the residual effect was assessed as possible (the effect may occur but is not likely). Based on the criteria discussed, the effect was not carried forward into the cumulative effects assessment.

9.3.2.4.4 Changes to Surface Water Quality from the Wash-Off of Organic Debris from Vegetation Maintenance Activities to Adjacent Waterbodies

9.3.2.4.4.1 Potential Effects

Similar to construction, vegetation maintenance activities during Operations will be required along the Community Access Road right-of-way and could result in changes to surface water quality, if not mitigated. Vegetation maintenance activities will include:

- Clearing and / or trimming vegetation along Community Access Road right-of-way to main line of sight safety requirements;
- Clearing and / or trimming vegetation along access roads and waterbody crossings requiring maintenance work;
- Minor landscaping to restore seasonal vegetation loss and improve aesthetics;
- Maintaining desired planting densities and vegetation height along slopes and in swales / ditches;
- Weed control (in other words, removal of undesirable plant species); and
- Removal of fallen trees / vegetation blocking flow in waterbodies (including emergency cases and before and after a significant storm event).

9.3.2.4.4.2 Mitigation and Enhancement Measures

- To minimize the potential effects on the water quality of receiving waterbodies due to vegetation maintenance activities, mitigation and enhancement measures will include:
- Removal of vegetation using mechanical means, except within 10 metres of a waterbody where chain saws and other hand-held equipment will be used;
- Avoiding soil disturbance, including grubbing, 30 metres of a waterbody;

- Maintaining a riparian buffer of 30 metres around waterbodies for the right-of-way, unless required for access to repair / replace waterbody crossing structures, in which case a 10 metres wide right-of-way for equipment access will be cleared within right-of-way. Temporary access roads will be cleared and will be 10 metres wide;
- Implementing appropriate erosion and sediment controls in accordance with the Ontario Provincial Standard Specifications for erosion and sediment control measures (Ministry of Transportation, 2021a, 2021b, 2021c) when clearing or disturbing areas within the 30 metre buffer;
- Relocating removed vegetation immediately outside a waterbody buffer zone (30 metres) and above its high-water mark; and
- Chemical vegetation maintenance will not involve the use of herbicides or pesticides, rather all vegetation maintenance will be carried out through mechanical removal or the use of environmentally friendly products.

9.3.2.4.4.3 Predicted Residual Effects

Based on the effective implementation of the mitigation measures described previously, coupled with other planning and strategies inherent to the design, no measurable changes to the concentrations of suspended solids are expected at receiving waterbodies as a result of wash-off of organic debris from mechanical vegetation maintenance activities during operations. The volume of water that could be potentially affected by clearing activities is expected to be small, meaning that potential loading of suspended solids including organic debris to the broader surface water system is anticipated to be relatively inconsequential. Further to this, the likelihood that this water is subsequently conveyed to a nearby waterbody is expected to be low, given the plans to maintain buffer zones of 30 metres around waterbodies, and limit clearing of riparian vegetation to the extent practicable and to the requirement of the Community Access Road and alignment clearing width only. Clearing at waterbody crossings along the 100 metre wide Community Access Road right-of-way will generally be limited to 10 metres for equipment access to waterbody crossing structures (for example, temporary bridges). Vegetation clearing or disturbed areas within the 30 metre buffer will be provided with appropriate erosion and sediment controls. As such, this potential Project–environment interaction during operations is not carried forward to the residual effects characterization.

9.3.2.4.5 Changes to Surface Water Quality and Sediment Quality from the Wash-Off of Accidental Spills and Leaks to Nearby Waterbodies

9.3.2.4.5.1 Potential Effects

During operations, Community Access Road will be available to the public and will connect communities and enable the smooth flow of goods and people. However, due to increased vehicular traffic and transportation of goods including hazardous materials, accidental spills and leaks may occur and potentially change surface water and sediment quality. As discussed above (construction phase), potential effects were also noted as a concern within the community of Marten Falls First Nation.

The causes of spills and leaks during operations include:

- Road accidents involving vehicles (including hazardous material carrying vehicles), collisions, rollovers or other incidents that can rupture the oil containers and cause spill to road surface;
- Mechanical failure of vehicles involving fuel tank leaks, engine leaks, faulty or worn-out component leaks; and
- Improper handling and transportation of hazardous materials such as spillage during refueling, negligence in securing containers, overloading or inadequate storage method.

Hazardous materials expected to be transported, handled or stored during operations include fuels (gasoline, diesel, propane), lubricating oils, greases, liquid chemicals, pesticides, sand, salts and dust suppressants.

In addition to above, maintenance activities during operations will also include transportation, storage, and handling of hazardous materials and the operation of vehicles and equipment. Accidental spills and leaks from the maintenance activities may also occur and potentially change surface water and sediment quality, if not mitigated.

9.3.2.4.5.2 Mitigation and Enhancement Measures

During the operational life of the Community Access Road, it is expected that the operators of vehicles (private and / or commercial vehicle drivers) will follow the regulations regarding the road safety, vehicle safety, and transportation and handling of hazardous material to help maintain the safety of road users and protect environment. It is also expected that highway Ontario Provincial Police will patrol the Community Access Road, enforce relevant regulations, when necessary, and respond to accidents immediately.

Spill containment will be carried out by commercial vehicle drivers. In the event that a spill exceeds the capability of on-site commercial drivers, or if specialized equipment is required, the local fire department will be contacted immediately to provide containment and support.

In addition to above expectations, mitigation and enhancement measures to minimize the potential effects on the water and sediment quality of receiving waterbodies due to accidental spills and leaks during the maintenance activities will include:

- Using vehicles or equipment for maintenance activities that are licensed and maintained according to safety requirements;
- Performing regular inspections of vehicles and equipment for leaks;
- Storing hazardous materials in designated areas designed and constructed to collect and contain minor leaks and spills;
- Developing and implementing Spill Prevention and Emergency Response Plan (including clean-up equipment and material, instructions, education and emergency numbers) for maintenance activities;
- Removing and hauling contaminated soil to an approved land facility for disposal; and
- Using sand on bridge decks and roads for de-icing instead of salt.

9.3.2.4.5.3 Predicted Residual Effects

The wash-off of fluids from accidental spills and leaks may result in an increase to the concentrations of chemical constituents in receiving waterbodies. However, leaks or spills are considered avoidable with good planning, adequate design, and proper emergency response. Further to this, the frequency, spatial extent, and severity of accidental spills or leaks during operations of the Project are anticipated to be minimized with the effective implementation of the mitigation and enhancement measures identified previously. However, it is recognized that, even with the best planning and the implementation of mitigation measures, the potential exists for accidents and malfunctions. As such, measurable changes (in other words, residual effects) to surface water and sediment quality in the form of increase to the concentrations of chemical constituents in receiving waterbodies could occur in the event of the wash-off from accidental spills or leaks to nearby waterbodies. Therefore, this Project–environment interaction during operations is carried forward to the residual effects characterization.

Accidental spills and leaks from vehicle accidents, mechanical failure and improper handling and transportation of hazardous material as well as the transportation, storage, and handling of hazardous materials and the operation of vehicles and equipment for maintenance activities, could be washed off into nearby waterbodies, if occurring in high enough volumes or during a runoff event, and could change the chemical constituents in receiving waters and affect surface water and sediment quality. The likelihood of occurrence of the residual effect was assessed as possible (the effect may occur but is not likely), given that the Spill Prevention and Emergency Response Plan for maintenance activities will be developed and implementation to minimize opportunities for the wash-off of spills and leaks to enter nearby waterbodies. Based on the criteria discussed, the effect was not carried forward into the cumulative effects assessment.

9.3.2.5 Summary of Residual Effects

Table 9.3-4 provides a summary of the potential effects for surface water, mitigation measures, and residual effects. Detailed information is included in **Appendix F**.

Table 9.3-4: Summary of Residual Effects for Surface Water and Characterization

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Surface Water Quantity**	• Constructing the Community Access Road • Constructing and installation of bridges and culverts • Construction and operation of temporary infrastructure	• Construction	• Changes to surface water quantity from short-term water taking	• Water taking will be in compliance with Ontario Regulation 387/04: Water Taking and Transfer under the Ontario *Water Resources Act* as amended by Ontario Regulation 64/16 (Government of Ontario, 1990d) (pertaining to permits, data and reporting, and water transfers), where applicable, and best industry practices. • Eligible activities will be registered on the Environmental Activity and Sector Registry. If an activity does not meet these criteria, a Permit to Take Water will be obtained. • Site specific water flow and / or levels triggers will be developed for sensitive water sources that may be affected by water takings, if needed. • Potable water for work sites, temporary construction camps, and temporary laydown areas will be obtained from surface water sources (with appropriate treatment as needed), bottled sources, and groundwater wells (only if necessary). • All water taking will be in compliance with the applicable legislation, regulations, and best industry practices.	• Residual changes to surface water quantity during construction from short-term water taking	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local Study Area • Duration: Short term • Frequency: Frequent • Reversibility: Reversible • Likelihood: Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Surface Water Quantity** • **Surface Water Quality** • **Sediment Quality**	• Constructing the Community Access Road • Construction and installation of bridges and culverts • Construction and operation of temporary infrastructure	• Construction	• Changes to surface water quantity, surface water quality, and sediment quality from short-term water discharges	• Construction water will be discharged in compliance with Ontario Regulation 387/04: Water Taking and Transfer under the Ontario *Water Resources Act* as amended by Ontario Regulation 64/16 (Government of Ontario, 1990d) or Ontario Regulation 63/16 under the *Environmental Protection Act* (Government of Ontario, 1990e), where applicable, and good industry practice. • Treatment and disposal of water from concrete batch plants at pits and quarries will be in compliance with Environmental Compliance Approvals issued by the Ministry of the Environment, Conservation and Parks under the *Environmental Protection Act* (Government of Ontario, 1990e), where applicable. • Waste associated with discharges from Project will be characterised and, in some cases, assimilative capacity study may be conducted where necessary. • Wash water from cleaning concrete mixing equipment and delivery systems, as well as from vehicles and equipment, will be collected in designated wash-out sites, located at least 30 metres from a waterbody. No contamination of rivers or streams by foreign materials is permitted. The wash-out site will be monitored regularly to verify that runoff from the area does not report to a waterbody. Following Construction, all temporary wash-out sites will be capped with local backfill and regraded prior to construction crews departing the site. • Domestic wastewater will be discharged to onsite leaching beds at the temporary construction camps. All required permits and authorizations will be acquired for construction and operation of the leaching beds. Leaching beds will be designed and constructed in	• Residual changes to surface water quantity, surface water quality and sediment quality from short-term water discharges	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local Study Area • Duration: Short term • Frequency: Frequent • Reversibility: Reversible • Likelihood: Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				accordance with Ontario Regulation 332/12: Building Code, under the *Building Code Act* (Government of Ontario, 1992). • If required and when feasible, domestic wastewater will be removed by approved disposal trucks and disposed of at wastewater treatment plants with authorization and capacity to accept this wastewater. • Construction water / wastewater (not requiring approvals) will be directed at, a minimum, to low-lying vegetation areas for infiltration, and measures such as filter fabric or straw bales will be utilized to minimize sediment transport during dewatering. • Marten Falls First Nation and / or the owner / operator will review discharge sites / locations to avoid discharging to sensitive areas, including areas identified through the Indigenous Knowledge Program.		
• **Surface Water Quantity** • **Surface Water Quality** • **Sediment Quality**	• Constructing bridges and install culverts • Decommissioning temporary infrastructure (for example, remove temporary culverts and bridges)	• Construction	• Changes to surface water quantity, surface water quality, and sediment quality during short-term water diversions at waterbody crossings	• The construction (and removal as needed) of temporary and permanent waterbody crossings, and removal of temporary waterbody crossing structures following the completion of the relevant work, will be in compliance with Ministry of the Environment, Conservation and Parks-specified conditions and Ministry of Natural Resources regulatory permits and approvals, as applicable. • Short-term water diversions (active or passive) will be carried out in accordance with Ontario Regulation 387/04: Water Taking and Transfer under the Ontario *Water Resources Act* as amended by Ontario Regulation 301/21 (Government of Ontario, 1990d). • Waterbody crossings will be designed and constructed in compliance with Ontario Regulation 454/96, under the Lakes and Rivers Improvement Act (Government of Ontario, 1990h), as applicable. • Waterbody crossings will be constructed in accordance with the Ministry of the Environment, Conservation and Parks specified conditions and Ministry of Naturals Resources approvals, if required. • Waterbody crossings will be designed and constructed in accordance with the Ministry of Natural Resources' Environmental Guidelines for Access Roads and Water Crossings (Ministry of Natural Resources, 1990) as well as Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales (Ministry of Natural Resources, 2010) and Technical Guide River and Stream Systems: Flooding Hazard Limit (Ministry of Natural Resources, 2002), as applicable. • To account for climate change effects, Marten Falls First Nation will also implement mitigation measures as outlined in Final Climate Adaptation and Resilience Technical Support Document (**Appendix Y**)	• Residual changes to surface water quantity, surface water quality, and sediment quality during short-term water diversions at water crossings	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration: Short term • Frequency: Infrequent • Reversibility: Reversible • Likelihood: Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				• Environmental monitoring (including water quality sampling / testing noted in Section 9.2 of the Technical Support Document; Appendix F) will be conducted during construction to verify the performance and effectiveness of the planned mitigation measures. Monitoring will occur during installation works, including all in-water activities, and continue during construction, including the removal of temporary crossing structures as part of construction decommissioning activities. The monitoring program will be under the direction of the Environmental Monitor and Indigenous Environmental Monitor. • Temporary waterbody crossings will be remediated at the end of Construction. The remediation will involve removal of temporary waterbody crossing structures (if constructed), restoration, and stabilization of waterbody banks and other disturbed areas when the crossing is no longer required. • An Adaptive Management Plan will be developed in the event of an unexpected change to water quantity or quality (in other words, increase in turbidity in accordance with Canadian Council of Ministers of the Environment standards).		
• **Surface Water Quantity** • **Surface Water Quality** • **Sediment Quality**	• Constructing and installing bridges and culverts	• Construction	• Changes to surface water quantity, surface water quality, and sediment quality due to changes in channel hydraulics at waterbody crossings	• Waterbody crossings will be designed and constructed in accordance with permits and approvals through Fisheries and Oceans Canada, and Ministry of Natural Resources, as applicable. • All newly installed or upgraded waterbody crossing structures will be in compliance with Ontario Regulation 239/13, under the *Public Lands Act* (Government of Ontario, 1990g) and Ontario Regulation 454/96, under the Lakes and Rivers Improvement Act (Government of Ontario, 1990h), as applicable. • Waterbody crossings will be designed and constructed in accordance with the Ministry of Natural Resources' Environmental Guidelines for Access Roads and Water Crossings (Ministry of Natural Resources, 2019) as well as Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales (Ministry of Natural Resources, 2010) and Technical Guide River and Stream Systems: Flood Hazard Limit (Ministry of Natural Resources, 2002), as applicable. • Marten Falls First Nation will implement mitigation measures as outlined in Climate Change Adaption and Resiliency Technical Support Document (**Appendix Y**). In addition, it is worth highlighting that the design of waterbody crossing structures (culverts and bridges) will consider climate change effects. • Waterbody crossing structures, including clear span bridges, ice bridges / snow fills, rig mats and culverts, will be primarily based on hydrologic and hydraulic design flow calculations, which consider, but are not limited to, expected rainfall and peak flow within the geographic area as well as the relevant catchment area, channel slope, and channel substrate.	• Residual changes to surface water quantity, surface water quality, and sediment quality due to changes in channel hydraulics at waterbody crossings	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local Study Area • Duration: Long term • Frequency: Infrequent • Reversibility: Irreversible • Likelihood: Possible • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				• At some locations where it is determined that spring-melt or storm runoff needs to pass from one side of the right-of-way to the other to prevent flooding and / or erosion, equalization culverts will be installed. • Each waterbody crossing will be visited ahead of construction by qualified environmental personnel and fisheries biologists and / or technicians (such as, Aquatics Specialist) to verify that the crossing location is conducive to the planned crossing structure installation, such that any changes in site conditions can be addressed through necessary design adjustments. During pre-construction site visits, surface water surveys at any waterbody crossing location that has not already been assessed as part of the field investigations will be conducted. • If site-specific changes to waterbody crossing structure type are required, engagement with appropriate regulatory authorities (such as, Fisheries and Oceans Canada, Ministry of Natural Resources) will occur prior to any instream construction activities, where appropriate (such as, placement of additional fill, regrading and / or stabilization of bed or banks). • To reduced the potential effects on cross-section hydraulics mitigation measures will include: – Minimizing the number of waterbody crossings required, to the extent possible and use of existing roads or trails; – Carrying out construction activities without any permanent in-water works except where culverts will be used; – Designing the infrastructure at waterbody crossings to pass peak flows (including extreme storm events caused by climate change, as appropriate) and maintain sufficient flow conveyance in such a way that no discernible effects on stream hydraulics occur. • Waterbody crossing design and construction will maintain the characteristic channel width, depths, slopes, and substrate in the event that a channel realignment is required, noting that: – Channel realignments and / or infillings will be avoided through Project planning and design to the extent practicable. – Channel realignments and / or infilling will only be undertaken in locations where specific conditions are met and / or where required for safety and security purposes; and if required. – Changes to stream morphology, including fitting a culvert to the channel alignment to minimize changes in stream morphology, will like likely require approval by Fisheries and Oceans Canada), with the plan and mitigations requiring reviewed by Ministry of Natural Resources through permitting the water crossing. • Prior to commencing construction work, Marten Falls First Nation and associated owner / operators will implement erosion and sediment control measures.		

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				• Upon completion of construction work, watercourse banks will be returned to their original profile and disturbed areas will be stabilized as necessary to prevent soil erosion. • At the end of construction, temporary waterbody crossings will be reclaimed.		
• **Surface Water Quantity** • **Surface Water Quality** • **Sediment Quality**	• Maintain the Community Access Road and permanent access roads, including bridges and culverts(Footnote a)	• Operations	• Changes to surface water quantity, surface water quality, and sediment quality due to changes in channel hydraulics at waterbody crossings	• Permanent culverts will be monitored in accordance with the Culvert Inspection Guide (Ministry of Transportation, 2022b) to identify and remove blockages (for example, ice, woody debris), as needed, that could otherwise lead to scouring and effects on channel morphology and fish habitat and potentially interfere with fish passage. • New permanent waterbody crossing structures (bridges), and roadside drainage features will be monitored and inspected for physical function and condition in accordance with the Ontario Structure Inspection Manual (Ministry of Transportation, 2008). • Waterbody crossings will be maintained in accordance with permits and approvals through Fisheries and Oceans Canada and Ministry of Natural Resources, as applicable. • Inspection and monitoring frequency will be increase during and after the heavy rainfall and flooding events as outlined in Climate Adaptation and Resiliency Technical Support Document (**Appendix Y**). • Problems identified during monitoring and inspection will be fixed immediately to prevent any further damage to the channel hydraulics, aquatic habitat and the fisheries resources. • In-water works will be minimized, where possible, and timing of work will also be limited to avoid period of fish spawning, incubation and migration. • Appropriate erosion and sediment control measures will be implemented in accordance with the Ontario Provincial Standard Specifications for erosion and sediment control measures (Ministry of Transportation, 2021a, 2021b, 2021c) prior to commencement of repair work. • Disturbed areas will be restored and re-vegetated to mitigate erosion and sediment entry to waterbodies. • Waterbody crossings will be repaired and reinforced in a manner that prevents waterbody crossing structure materials from entering waterbodies. • Entry of waste materials to be stabilized or disposed of will be prevented in waterbodies. • Waterbody crossings will be reconstructed, when necessary, in compliance with Ministry of Natural Resources approvals.	• Residual changes to surface water quantity, surface water quality, and sediment quality due to changes in channel hydraulics at waterbody crossings	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local Study Area • Duration: Short term • Frequency: Infrequent • Reversibility: Reversible • Likelihood: Possible • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Surface Water Quantity** • **Surface Water Quality** • **Sediment Quality**	• Clearing of the right-of-way for the Community Access Road and supporting access roads • Constructing the Community Access Road • Constructing and operating temporary infrastructure • Decommissioning temporary infrastructure	• Construction	• Changes to surface water quantity, surface water quality, and sediment quality due to changes in land cover	• The right-of-way, roads, and trails (existing and new) will be used for access, to the extent practicable, to minimize changes in land cover. • Upgrade and construction of new access road will be in accordance with the Environmental Guidelines for Access Roads and Water Crossings (Ministry of Natural Resources, 2019). • Temporary construction camps, temporary laydown areas, and other Project activities will be located a minimum of 30 metres away from the ordinary high-water mark of a waterbody. • Progressive revegetation of the right-of-way using native seed or appropriate tree species will be implemented, as appropriate. Temporary access roads and trails, temporary construction camps, turn-around areas, waterbody crossings, and temporary laydown areas will be progressively restored to pre-existing compatible condition through the Construction. • Seeding will follow as close as possible to final cleanup and topsoil material replacement pending seasonal or weather conditions. • Only materials cleared for acid rock drainage (such as, non-potentially acid-generating rock) by a geochemical verification process will be used for the road surface to avoid acid rock drainage or associated metal leaching. • Marten Falls First Nation and associated owner / operator will limit the use of off-road vehicles during construction, noting that: – Off-road vehicle use will follow the Code of Practice: Temporary Fords (Fisheries and Oceans Canada, 2022), All-Terrain Vehicles, Fish Habitat and You guidance (Fisheries and Oceans Canada, 2010), and Ontario Regulation 316/03, under the Highway Traffic Act (Government of Ontario, 1990f). – Inspections and maintenance activities will include cleaning of off-road vehicles before and after each use to prevent the spread of invasive species and to identify any fuel leaks or equipment damage. – Avoidance of sensitive features and waterbody crossings to the extent practicable. • Erosion and Sediment Control Plan will be developed and implemented in accordance with Ontario Provincial Standard Specifications for erosion and sediment control measures (Ministry of Transportation, 2021a, 2021b, 2021c). This includes provision of multistage drainage and sediment controls to collect and treat stormwater runoff from Project components, as appropriate. These controls may include diversion swales / dykes, collection ditches, silt fences, rock check dams, sediment traps / basins, level spreaders and riparian buffer strips. An Erosion and Sediment Control Plan will be provided in permit/approval applications for review by regulatory agencies, as applicable, in advance of construction activities. • Climate change factors will be considered in the selection and implementation of site-specific mitigation and enhancement measures, and increasing the inspection and monitoring frequency during and after the heavy rainfall and flooding events as outlined in Climate Adaption and Resilience Technical Support Document (**Appendix Y**).	• Residual changes to surface water quantity, surface water quality, and sediment quality due to changes in land cover	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration: Long term • Frequency: Frequent • Reversibility: Irreversible • Likelihood: Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Surface Water Quantity** • **Surface Water Quality** • **Sediment Quality**	• Maintain the Community Access Road and permanent access roads, including bridges and culverts(Footnote a)	• Operations	• Changes to surface water quantity, surface water quality, and sediment quality due to changes in land cover	• Disturbance to existing land cover during maintenance works will be kept to a minimum level. • Disturbed areas will be restored and re-vegetated to mitigate changes to runoff rates and erosion / sedimentation processes. • Existing access roads and trails for access, if available, will be used, to the extent practicable, to minimize new disturbance. • New access road will be upgraded in accordance with the Environmental Guidelines for Access Roads and Water Crossing (Ministry of Natural Resources, 2019), which provides comprehensive guidance with respect to design and construction practices to mitigate environmental effects. • Materials cleared for acid rock drainage (such as, non-potentially acid-generating rock) by a geochemical verification process for the road resurfacing, when necessary, will be used to avoid acid rock drainage or associated metal leaching. • Off-road vehicles will be inspected and cleaned before and after each use to prevent the spread of invasive species and to identify any fuel leaks or equipment damage. • Appropriate erosion and sediment control measures will be implemented in accordance with the Ontario Provincial Standard Specifications for erosion and sediment control measures (Ministry of Transportation, 2021a, 2021b, 2021c) prior to commencement of maintenance work. • Climate change factors will be considered in the selection and implementation of site-specific mitigation and enhancement measures, and increasing the inspection and monitoring frequency during and after the heavy rainfall and flooding events as outlined in Climate Adaption and Resiliency Technical Support Document (**Appendix Y**)	• Residual changes to surface water quantity, surface water quality, and sediment quality due to changes in land cover	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration: Short term • Frequency: Infrequent • Reversibility: Reversible • Likelihood: Possible • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Surface Water Quality**	• Clearing of the right-of-way for the Community Access Road and supporting access roads • Blasting rock • Constructing the Community Access Road • Constructing and operating temporary infrastructure • Decommissioning temporary infrastructure	• Construction	• Changes to surface water quality from the transport and delivery of airborne particulate matter to nearby waterbodies	• Mitigation measures provided in the Atmospheric Environment Technical Support Document (**Appendix S**) will be implemented. • Potential mitigation measures outlined in the Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions for Provincial Transportation Projects (Ministry of Transportation, 2020) may be implemented, if feasible.	• No residual effect anticipated	• No residual effect anticipated

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Surface Water Quality**	• Operate the Community Access Road and permanent access roads • Maintain the Community Access Road and permanent access roads, including bridges and culverts(Footnote a)	• Operations	• Changes to surface water quality from the transport and delivery of airborne particulate matter to nearby waterbodies	• Mitigation measures provided in the Atmospheric Environment Technical Support Document (**Appendix S**) will be implemented. • Potential mitigation measures outlined in the Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions for Provincial Transportation Projects (Ministry of Transportation, 2020) may be implemented, if feasible.	•	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Local Study Area • Duration: Long term • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Possible • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Surface Water Quality**	• Clearing of the right-of-way for the Community Access Road and supporting access roads • Constructing the Community Access Road • Construction and operation of temporary infrastructure	• Construction	• Changes to surface water quality from the wash-off of trash, domestic waste, and leachate at waste handling and storage facilities to nearby waterbodies	• Marten Falls First Nation or the owner / operator will prepare and implement Waste Management Plans that describe the appropriate management of solid, liquid, and hazardous waste. • Portable, secure, solid waste receptacles will be provided on work sites and temporary laydown areas and the solid waste collected will be hauled periodically to waste handling and storage facilities located at the temporary construction camps; • Solid waste handling and storage facilities at temporary construction camps will be sited outside a minimum 30 metre buffer around waterbodies. • Solid waste handling and storage facilities at temporary construction camps and aggregate pits and quarries will be provided with drainage controls. • Marten Falls First Nation, or the owner / operator, will prepare and implement a Spill Prevention and Emergency Response Plan that describes specific measures that would be implemented if a spill occurred. • Only materials cleared for acid rock drainage (such as, non-potentially acid-generating rock) by a geochemical verification process will be used for the road surface to avoid acid rock drainage or associated metal leaching. • Solid waste will be managed and disposed in compliance with Ontario Regulation 347 as amended by Ontario Regulation 105/24 under the *Environmental Protection Act* (Government of Ontario, 1990e). • Hazardous waste will be periodically transported by a registered hauler to an approved disposal site.	• No residual effect anticipated	• No residual effect anticipated

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Surface Water Quality**	• Clearing of the right-of-way for the Community Access Road and supporting access roads	• Construction	• Changes to surface water quality from the wash-off of organic debris from vegetation maintenance activities to adjacent waterbodies	• A riparian buffer of 30 metres around waterbodies will be maintained for the right-of-way, unless required for access to install waterbody crossing structures, in which case a 10 metres wide right-of-way for equipment access will be cleared within right-of-way. • Temporary access roads will be cleared and will be 10 metres wide. • Vegetation clearing will consist of cutting tree trunks parallel to and within 15 centimetres of the ground or lower as well as the removal of all shrubs, debris, and other such materials. • Vegetation will be largely removed by mechanical means, except within 10 metres of a watercourse or wetland. In these areas, vegetation will be removed manually, using chain saws and other hand-held equipment, while leaving the undergrowth and duff layer undisturbed to prevent erosion. • Vegetation clearing or disturbed areas within the 30 metre buffer will be provided with appropriate erosion and sediment controls in accordance with the Ontario Provincial Standard Specifications for erosion and sediment control measures (Ministry of Transportation, 2021a, 2021b, 2021c). • Removed vegetation will be immediately transported outside a waterbody buffer zone (30 metres) and above its high-water mark. • Chemical vegetation maintenance will not involve the use of herbicides or pesticides, rather all vegetation maintenance will be carried out through mechanical removal or the use of environmentally friendly products.	• No residual effect anticipated	• No residual effect anticipated
• **Surface Water Quality**	• Maintain the Community Access Road and permanent access roads, including bridges and culverts(Footnote a)	• Operations	• Changes to surface water quality from the wash-off of organic debris from vegetation maintenance activities to adjacent waterbodies	• Vegetation will be removed using mechanical means, except within 10 metres of a waterbody where chain saws and other hand-held equipment will be used. • Soil disturbance, including grubbing, will be avoided within 30 metres of a waterbody. • A riparian buffer of 30 metres around waterbodies for the right-of-way will be maintained, unless required for access to repair / replace waterbody crossing structures, in which case a 10 metres wide right-of-way for equipment access will be cleared within right-of-way. Temporary access roads will be cleared and will be 10 metres wide. • Appropriate erosion and sediment controls will be implemented in accordance with the Ontario Provincial Standard Specifications for erosion and sediment control measures (Ministry of Transportation, 2021a, 2021b, 2021c) when clearing or disturbing areas within the 30 metre buffer. • Removed vegetation will be relocated immediately outside a waterbody buffer zone (30 metres) and above its high-water mark. • Chemical vegetation maintenance will not involve the use of herbicides or pesticides, rather all vegetation maintenance will be carried out through mechanical removal or the use of environmentally friendly products.	• No residual effect anticipated	• No residual effect anticipated

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Surface Water Quality** • **Sediment Quality**	• Clearing of the right-of-way for the Community Access Road and supporting access roads • Constructing the Community Access Road • Constructing and operating temporary infrastructure • Decommissioning temporary infrastructure	• Construction	• Changes to surface water quality and sediment quality from the wash-off of organic debris to nearby waterbodies and / or increased rates of erosion in disturbed and exposed areas with sediment transport and delivery to adjacent waterbodies	• During construction, existing access to roads or trails, if available, will be used as much as possible to limit disturbance resulting from construction of new Community Access Road. • Temporary laydown areas and temporary construction camps will be constructed on existing disturbed areas and / or at reasonably flat areas with stable soil, where possible. • The new Community Access Road and waterbody crossings will be designed and constructed in accordance with the Ministry of Natural Resources' Environmental Guidelines for Access Roads and Water Crossings (Ministry of Natural Resources, 2019). • Water crossings will be constructed in compliance with Ontario Regulation 239/13, under the *Public Lands Act* (Government of Ontario, 1990g) and / or Ontario Regulation 454/96, under the Lakes and Rivers Improvement Act (Government of Ontario, 1990h), as applicable. • Buffer zones of 30 metres will be maintained around waterbodies and clearing of riparian vegetation will be limited to the extent practicable and to the requirement of the access road and alignment clearing width only. Clearing at waterbody crossings along the Community Access Road right-of-way will generally be limited to a 10 metres wide right-of-way for equipment access to waterbody crossing structures (for example, temporary bridges). • Removed vegetation will be immediately transported outside a waterbody buffer zone and above its high-water mark to minimize disturbance to the bed and banks. • Marten Falls First Nation with the owner / operator will work with both Indigenous communities and forest management units to manage merchantable timber cleared by the Project. • Slash and debris will be chipped and spread over the right-of-way or offered to Indigenous Communities. • Marten Falls First Nation, or the owner / operator, will develop and implement Erosion and Sediment Control Plan. Marten Falls First Nation, or the owner / operator, will install, monitor, and manage appropriate erosion and sedimentation control measures in accordance with Ontario Provincial Standard Specifications for erosion and sediment control measures (Ministry of Transportation, 2021a, 2021b, 2021c) to minimize or avoid sediment mobilization to drainages, or waterbodies. Adequate and appropriate erosion and sedimentation control materials will be on site and available prior to commencement of Construction. • Disturbed areas will be stabilized (for example, cover exposed areas with erosion control blankets or tarps to keep the soil in place and prevent erosion) as needed. Such areas will be covered with mulch to prevent erosion. • Sedimentation in the receiving environment will be controlled by directing sediment-laden water to various temporary storage and	• Residual changes to surface water quality and sediment quality from the wash-off of organic debris to nearby waterbodies and / or increased rates of erosion in disturbed and exposed areas with sediment transport and delivery to adjacent waterbodies	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Local Study Area • Duration: Short term • Frequency: Frequent • Reversibility: Reversible • Likelihood: Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				settlement features (such as, sumps, settling ponds or catch basins) prior to discharge. Alternately, where appropriate, the sediment-laden water will be directed to drain / filter through low gradient, well-vegetated areas away from watercourses (such as, using pumps and hoses).		
• **Surface Water Quality** • **Sediment Quality**	• Clearing of the right-of-way for the Community Access Road and supporting access roads • Constructing the Community Access Road • Constructing and operating temporary infrastructure • Decommissioning temporary infrastructure	• Construction	• Changes to surface water quality and sediment quality from the wash-off of organic debris to nearby waterbodies and / or increased rates of erosion in disturbed and exposed areas with sediment transport and delivery to adjacent waterbodies	• Sediment control measures will be incorporated prior to construction activities or immediately after disturbance on site-specific cases throughout the Project to avoid introduction of sediment to the environment, and, as part of this, to stabilize drifting soils or loss of topsoil, as practicable. Sediment control measures may include silt fences, filter bags, straw bale fences, berms, ponds and gravel or vegetative filters, check dams, erosion control blankets, and other features. • Additional contingency measures will be implemented as appropriate in the event of excessive rain, wet weather, or flood-like conditions (when the planned activity could cause significant damage to soils, such as rutting by traffic through the topsoil, soil structure damage during soil handling, or compaction and associated pulverization of topsoil structure damage due to heavy traffic): – Reschedule work or reduce / detour traffic in areas where soils are considered to be excessively wet. – Restrict construction traffic, where feasible, to equipment with low-ground pressure tires or wide pad tracks. – During excessively wet conditions, work only in non-problem areas, such as well-drained soil or well-sodded lands, until conditions improve. – Limit vehicle access through soft / wet areas to periods when frozen conditions occur (such as, early morning / evening) and have crews park in a stable area and walk to onsite equipment if feasible. – Install access or rig matting in problem areas to protect soils. – If necessary, work will be suspended until soils dry out or appropriate site-specific mitigation can be used to prevent soil disturbance. • Progressive reclamation of disturbed areas will be practiced. Where seeding will be required, erosion prone areas will be seeded with a native cover crop and certified seed mix approved by the applicable regulatory agency, as soon as feasible after Construction. • All aggregate pits will be located a minimum of 120 metres away from the ordinary high-water mark of a waterbody, where possible. The aggregate pits will follow the guidelines and associated conditions / requirements of the approved permits, including development of a rehabilitation plan, outlined in Provincial Standards of Ontario - Category 9 - Pit Above Water (Ministry of Natural Resources, 2006) and the Forest Management Planning Manual (Ministry of Natural Resources and Forestry, 2020b). • Climate change factors will be considered in design of the Community Access Road, waterbody crossing, and stormwater management works, and the implementation of proposed mitigation and enhancement measures (including measures outlined in the Climate Adaption and Resiliency Technical Support Document; **Appendix Y**).	• Residual changes to surface water quality and sediment quality from the wash-off of organic debris to nearby waterbodies and / or increased rates of erosion in disturbed and exposed areas with sediment transport and delivery to adjacent waterbodies	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Local Study Area • Duration: Short term • Frequency: Frequent • Reversibility: Reversible • Likelihood: Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Surface Water Quality** • **Sediment Quality**	• Clearing of the right-of-way for the Community Access Road and supporting access roads • Blasting rock • Constructing the Community Access Road • Constructing bridges and install culverts • Construction and operation of temporary infrastructure • Decommissioning temporary infrastructure	• Construction	• Changes to surface water quality and sediment quality from the wash-off of accidental spills and leaks to nearby waterbodies	• The transportation, storage, and handling of fuels during construction will be in compliance with the *Transportation of Dangerous Goods Act* (Government of Canada, 1992) and the Technical Standards and Safety Act (Government of Ontario, 2000). • The aboveground storage tanks will meet the requirements of the Canadian Council of Ministers of the Environment (2003). • Marten Falls First Nation or the owner / operator will prepare and implement Waste Management Plans that describe the appropriate management of solid, liquid, and hazardous waste. • Marten Falls First Nation with the owner / operator will prepare and implement a Spill Prevention and Emergency Response Plan in accordance with Part X of the *Environmental Protection Act* and Ontario Regulation 675/98, under the *Environmental Protection Act* (Government of Ontario, 1990e). • A Spill Prevention and Emergency Response Plan will be provided in permit/approval applications for review by regulatory agencies, as applicable, in advance of construction activities. • Fuel and hazardous materials will be transported in approved containers in licensed vehicles. • Transportation of fuel on winter roads will only take place in safe ice conditions, noting that at the onset of the Community Access Road, fuel will be transported by aircraft to the fuel storage facility. • Vehicles used for transportation will be licensed and maintained in accordance with safety requirements. Vehicles and equipment used for construction will be regularly serviced, maintained and inspected for leaks. • Fuel and hazardous materials will be stored and handled in designated areas with appropriate secondary containment. • Refuelling, service, and maintenance of vehicles and equipment will generally be carried out in designated areas at temporary construction camps and temporary laydown areas located a minimum of 120 metres from waterbodies to the extent possible. • Designated refuelling, service, and maintenance areas will be designed and constructed to collect and contain minor leaks and spills, and will also have adequate lighting available to help prevent the potential for spills during hours when daylight is not available. • If refuelling within 120 metres of a waterbody cannot be avoided, enhanced spill containment measures, such as a Spill Prevention and Emergency Response Plan, will be used. • In the event that refuelling, servicing, and maintenance is required in the field, 120-metre buffer will be respected to the extent possible. There may be locations where this is not possible due to the prevalence of wetlands; however, in these locations, enhanced spill containment measures will be used. • Spill response kits will be provided in fuel and hazardous materials storage and handling facilities at temporary construction camps and	• Residual changes to surface water quality and sediment quality from the wash-off of accidental spills and leaks to nearby waterbodies	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Construction Disturbance Area • Duration: Short term • Frequency: Infrequent • Reversibility: Reversible • Likelihood: Possible • Significance: Not Significant • Uncertainty: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				temporary laydown areas, in onsite work areas, and / or in vehicles and equipment, and personnel will be trained in spill response practices and procedures. • Spills and leaks will be contained and cleaned up as soon as possible following incident and disposed of at a treatment facility with authorization and capacity to accept this waste.		
• **Surface Water Quality** • **Sediment Quality**	• Maintain the Community Access Road and permanent access roads, including bridges and culverts (Footnote a)	• Operations	• Changes to surface water quality and sediment quality from the wash-off of accidental spills and leaks to nearby waterbodies	• Vehicles or equipment for maintenance activities will be licensed and maintained in accordance with safety requirements. • Regular inspections of vehicles and equipment for leaks will be performed. • Hazardous materials will be stored in designated areas designed and constructed to collect and contain minor leaks and spills. • Spill Prevention and Emergency Response Plan (including clean-up equipment and material, instructions, education and emergency numbers) for maintenance activities will be developed and implemented. • Contaminated soil will be removed and hauled to an approved land facility for disposal. • Sand will be used on bridge decks and roads for de-icing instead of salt.	• Residual changes to surface water quality and sediment quality from the wash-off of accidental spills and leaks to nearby waterbodies	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Construction Disturbance Area • Duration: Short term • Frequency: Infrequent • Reversibility: Reversible • Likelihood: Possible • Significance: Not Significant • Uncertainty: Moderate • Direct / Indirect: Direct
• **Surface Water Quality** • **Sediment Quality**	• Clearing of the right-of-way for the Community Access Road and supporting access roads • Blasting rock (for example, remove rock at quarries and, as required, at specific locations in association with road and bridge construction) • Constructing the Community Access Road • Constructing bridges and install culverts	• Construction	• Changes to surface water quality and sediment quality from the wash-off of explosives spills and residues from blasting activities to nearby waterbodies	• The transportation and storage of explosives will be in compliance with the Explosives Act (Government of Canada, 1985) and the *Transportation of Dangerous Goods Act* (Government of Canada, 1992), where applicable. • Ammonium nitrate and fuel oil will not be used. Explosives will be in emulsion form (ammonium nitrate emulsion) to mitigate potential dissolution and poor explosive performance in the presence of water. • Blasting activities will also be in accordance with aggregate permit / licence issued under the *Aggregate Resources Act* (Government of Ontario, 1990b). • Marten Falls First Nation or the owner / operator will prepare and implement a Blasting and Communication Management Plan that describes specific measures that would be implemented if blasting is required. • The Environmental Inspector will monitor blasting operations for adherence to the Blasting and Communication Management Plan. • Discarded explosives will either be detonated on site as part of the blast with explosives packaging daily or temporarily stored in the explosives magazine and returned to the explosives' distributor.	• Residual changes to surface water quality and sediment quality from the wash-off of explosives spills and residues from blasting activities to nearby waterbodies	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Construction Disturbance Area • Duration: Short term • Frequency: Frequent • Reversibility: Reversible • Likelihood: Possible, where proposed work is below the high-water mark (for example, installation of a culvert) and / or where spills occur less than 30 metres away from the high watermark • Significance: Not Significant • Uncertainty: Moderate • Direct / Indirect: Direct

Footnotes: (a) Includes General Maintenance (for example, grading, erosion control, quarrying, pits and quarries), Seasonal Maintenance (for example, snow clearing and bridge and culvert maintenance), and Special Maintenance (for example, slope failures and road settlement / break-up).

9.3.3 Fish and Fish Habitat

9.3.3.1 Project-Environment Interactions

As a component of the effects assessment, the Project activities were reviewed to find potential environmental interactions. These interactions were then assessed for potential effect (**Table 9.3-5**).

Table 9.3-5: Project-Environment Interactions – Fish and Fish Habitat

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• **Construction**	• Constructing the Community Access Road; • Constructing bridges and installing culverts; • Construction of temporary infrastructure (for example access roads, construction camps, laydown areas, and staging areas); and • Decommissioning of temporary infrastructure.	• Lake Sturgeon (Acipenser fulvescens) • Walleye (Sander vitreus) • Speckled Trout / Brook Trout (Salvelinus fontinalis); • Northern Pike (Esox lucius) • Lake Whitefish (Coregonus clupeaformis • Burbot (Lota lota)	• Habitat quantity and quality	• Changes to fish habitat quantity and quality through physical alteration of waterbodies
• **Construction**	• Clearing of the right-of-way and temporary access roads; • Constructing the Community Access Road; • Construction of temporary infrastructure (for example access roads, construction camps, laydown areas, and staging areas); and • Decommissioning of temporary infrastructure.	• Lake Sturgeon • Walleye • Speckled Trout / Brook Trout • Northern Pike • Lake Whitefish • Burbot	• Habitat quantity and quality	• Changes to fish habitat quantity and quality through changes to riparian vegetation
• **Construction**	• Constructing the Community Access Road; • Constructing bridges and installing culverts; • Construction of temporary infrastructure (for example access roads, construction camps, laydown areas, and staging areas); and • Decommissioning of temporary infrastructure.	• Lake Sturgeon • Walleye • Speckled Trout / Brook Trout • Northern Pike • Lake Whitefish • Burbot	• Survival and reproduction	• Injury or mortality of fish from instream construction
• **Construction**	• Clearing of the right-of-way and temporary access roads; • Constructing the Community Access Road; • Constructing bridges and installing culverts; • Construction of temporary infrastructure (for example access roads, construction camps, laydown areas, and staging areas); and • Decommissioning of temporary infrastructure.	• Lake Sturgeon • Walleye • Speckled Trout / Brook Trout • Northern Pike • Lake Whitefish • Burbot	• Habitat quantity and quality	• Changes to habitat quality from release of sediment at waterbody crossings
• **Construction**	• Clearing of the right-of-way and temporary access roads; • Constructing the Community Access Road; • Constructing bridges and installing culverts; • Construction of temporary infrastructure (for example access roads, construction camps, laydown areas, and staging areas); and • Decommissioning of temporary infrastructure.	• Lake Sturgeon • Walleye • Speckled Trout / Brook Trout • Northern Pike • Lake Whitefish • Burbot	• Habitat quantity and quality	• Changes to fish habitat quantity and quality from the placement of waterbody crossing structures and changes in channel morphology
• **Construction**	• Constructing bridges and installing culverts • Construction of temporary infrastructure (for example access roads, construction camps, laydown areas, and staging areas)	• Lake Sturgeon • Walleye • Speckled Trout / Brook Trout • Northern Pike • Lake Whitefish • Burbot	• Distribution and connectivity • Survival and reproduction	• Changes to fish survival, reproduction, and distribution from the placement of waterbody crossing structures, affecting fish access to habitats
• **Construction**	• Clearing of the right-of-way and temporary access roads; • Constructing the Community Access Road; • Constructing bridges and installing culverts; and • Construction of temporary infrastructure (for example access roads, construction camps, laydown areas, and staging areas).	• Lake Sturgeon • Walleye • Speckled Trout / Brook Trout • Northern Pike • Lake Whitefish • Burbot	• Habitat quantity and quality	• Changes to fish habitat quantity and quality due to changes in hydrology or groundwater that may alter drainage patterns and increase or decrease drainage flows and surface water levels
• **Construction**	• Blasting rock	• Lake Sturgeon • Walleye • Speckled Trout / Brook Trout • Northern Pike • Lake Whitefish • Burbot	• Survival and reproduction	• Blasting-related injuries or mortality to fish

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• **Construction**	• Clearing of the right-of-way and temporary access roads; • Blasting rock; • Constructing the Community Access Road; • Constructing bridges and installing culverts; • Construction of temporary infrastructure (for example access roads, construction camps, laydown areas, and staging areas); and • Decommissioning of temporary infrastructure.	• Lake Sturgeon • Walleye • Speckled Trout / Brook Trout • Northern Pike • Lake Whitefish • Burbot	• Habitat quantity and quality	• Changes to fish habitat quality from the deposition of air contaminants and fugitive dust emissions
• **Construction**	• Constructing the Community Access Road; • Constructing bridges and installing culverts; and • Construction of temporary infrastructure (for example access roads, construction camps, laydown areas, and staging areas).	• Lake Sturgeon • Walleye • Speckled Trout / Brook Trout • Northern Pike • Lake Whitefish • Burbot	• Survival and reproduction	• Changes to fish survival and reproduction from improved public access to recreational angling areas
• **Construction**	• Clearing of the right-of-way and temporary access roads; • Blasting rock; • Constructing the Community Access Road; • Constructing bridges and installing culverts; • Construction of temporary infrastructure (for example access roads, construction camps, laydown areas, and staging areas); and • Decommissioning of temporary infrastructure.	• Lake Sturgeon • Walleye • Speckled Trout / Brook Trout • Northern Pike • Lake Whitefish • Burbot	• Survival and reproduction	• Changes to fish survival and reproduction from spills of fuel or other materials
• **Operations**	• Operating the Community Access Road and permanent access roads; and • Maintaining the Community Access Road and permanent access roads, including bridges and culverts;	• Lake Sturgeon • Walleye • Speckled Trout / Brook Trout • Northern Pike • Lake Whitefish • Burbot	• Habitat quantity and quality	• Changes to fish habitat quantity and quality through physical alteration of waterbodies
• **Operations**	• Maintaining the Community Access Road and permanent access roads, including bridges and culverts	• Lake Sturgeon • Walleye • Speckled Trout / Brook Trout • Northern Pike • Lake Whitefish • Burbot	• Habitat quantity and quality	• Changes to fish habitat quantity and quality through changes to riparian vegetation
• **Operations**	• Operating the Community Access Road and permanent access roads; and • Maintaining the Community Access Road and permanent access roads, including bridges and culverts.	• Lake Sturgeon • Walleye • Speckled Trout / Brook Trout • Northern Pike • Lake Whitefish • Burbot	• Habitat quantity and quality	• Changes to fish habitat quantity and quality from the placement of waterbody crossing structures and changes in channel morphology
• **Operations**	• Operating the Community Access Road and permanent access roads; and • Maintaining the Community Access Road and permanent access roads, including bridges and culverts.	• Lake Sturgeon • Walleye • Speckled Trout / Brook Trout • Northern Pike • Lake Whitefish • Burbot	• Distribution and connectivity • Survival and reproduction	• Changes to fish survival, reproduction, and distribution from the placement of waterbody crossing structures, affecting fish access to habitats
• **Operations**	• Operating the Community Access Road and permanent access roads; and • Maintaining the Community Access Road and permanent access roads, including bridges and culverts.	• Lake Sturgeon • Walleye • Speckled Trout / Brook Trout • Northern Pike • Lake Whitefish • Burbot	• Habitat quantity and quality	• Changes to fish habitat quantity and quality due to changes in hydrology or groundwater that may alter drainage patterns and increase or decrease drainage flows and surface water levels

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• **Operations**	• Operating the Community Access Road and permanent access roads; and • Maintaining the Community Access Road and permanent access roads, including bridges and culverts.	• Lake Sturgeon • Walleye • Speckled Trout / Brook Trout • Northern Pike • Lake Whitefish • Burbot	• Habitat quantity and quality	• Changes to fish habitat quality from the deposition of air contaminants and fugitive dust emissions
• **Operations**	• Operating the Community Access Road and permanent access roads; and • Maintaining the Community Access Road and permanent access roads, including bridges and culverts.	• Lake Sturgeon • Walleye • Speckled Trout / Brook Trout • Northern Pike • Lake Whitefish • Burbot	• Survival and reproduction	• Changes to fish survival and reproduction from improved public access to recreational angling areas
• **Operations**	• Operating the Community Access Road and permanent access roads; and • Maintaining the Community Access Road and permanent access roads, including bridges and culverts.	• Lake Sturgeon • Walleye • Speckled Trout / Brook Trout • Northern Pike • Lake Whitefish • Burbot	• Survival and reproduction	• Changes to fish survival and reproduction from spills of fuel or other materials

9.3.3.2 Discipline-Specific Characteristics

In support of the residual effects characteristics described in **Section 6.7.3**, **Table 6-1**, the following fish and fish habitat definitions apply to the effects assessment.

Ecological and Social Context

Ecological context for fish and fish habitat valued components considers species sensitivity, resilience, adaptive capacity, current status and trends, applicable legislation, and best management practices. The current and future sensitivity and resilience of fish and fish habitat valued components to change caused by the Community Access Road are considered and include Indigenous Knowledge where it was available. The ecological context of the effect includes a discussion of the environmental consequences of the predicted effect. Consideration of ecological context includes timing when it is important in the evaluation of the effect, such as when the effect could occur during a species life cycle window. Context also considered whether the residual effect would alter the ability of the valued component fish populations to be self sustaining and ecologically effective.

Magnitude

When evaluating the magnitude of effects, the fish and fish habitat assessment considered both the proportion of the valued component affected within identified spatial boundaries and the relative effect.

For magnitude, environmental discipline-specific definitions were developed as part of the study plan; however, the rationale for “low” magnitude was changed. During construction, there is potential for the death of fish during normal activities or harvest (for example during a fish salvage); however, this will not result in a change in the population dynamics; therefore, a low rating is suitable.

For magnitude, environmental discipline-specific definitions are required and are provided in (**Table 9.3-6**).

Table 9.3-6: Fish and Fish Habitat Magnitude Definition

Magnitude Level	Definition	Rationale
• Negligible	• None or negligible change to existing habitat conditions or fish behaviour	• No change in function or productivity of valued component habitat. • No change in behaviour or survival of valued component. • Minor change in valued component habitat to a degree that does not reduce productivity or function. • Minor disturbance to valued component behaviour that does not impede valued components from carrying out their life processes; for example, temporary impediments to fish movement or access to habitat during dewatering outside of important timing windows such as spawning. • Potential incidental death of individual fish to a degree that is not likely to disrupt overall population dynamics or affect local productivity.
• Low	• Minor change to existing habitat and conditions without loss of local productivity	• Habitat of valued components remain suitable and functional but decrease in productivity. • Minor or temporary disturbance to fish that may interrupt a life process but not decrease productivity or prevent fish from carrying out the activity; for example, alteration or infill of a minor portion of productive littoral area used by valued component for feeding. • Potential incidental death of fish to a degree that is not likely to disrupt overall population dynamics or affect local productivity.
• Medium	• Change to existing habitat and conditions that results in decrease in function and productivity and / or potential harm to fish	• Habitat quality and function is reduced but not eliminated. • Decrease in productivity. • Impediment to fish from carrying out life processes. • Potential incidental death of fish to a degree that is not likely to disrupt overall population dynamics but may affect local productivity.
• High	• Change to existing habitat and conditions that renders them unusable to fish and / or increases the likelihood of harm to fish	• Destruction, complete displacement, or alteration of habitat, rendering it no longer suitable for the function at existing conditions. • Loss of productivity as a result of loss of habitat function. • Restricting fish from carrying out life processes, such as complete barrier to fish migration to spawning habitat. • The death of fish to a degree that results in changes to population dynamics.

9.3.3.3 Residual Effects – Construction Phase

9.3.3.3.1 Changes to Fish Habitat Quantity and Quality Through Physical Alterations of Waterbodies

9.3.3.3.1.1 Potential Effects

The construction of the Community Access Road has the potential for direct and indirect effects that could cause negative changes to fish habitat quantity and quality through physical alteration of waterbodies. Permanent waterbody crossing structures are required on the Preferred Route and temporary waterbody crossing structures are required along the temporary access roads. These waterbody crossings have the potential to directly affect fish habitat quantity and quality in each of the waterbodies where they are installed. Where new waterbody crossing structures are proposed, the primary preferred structures to be used are culverts, clear span bridges, and multi-span bridges. For temporary crossings, culverts, clear span bridges, and ice bridges will be used.

Disturbances that may affect fish habitat directly from Construction of waterbody crossings include:

- Operation of heavy machinery in the waterbody for installation of a crossing structure;
- Installation of isolation structures;
- Bank treatments, site preparation, and restoration / reclamation;
- Placement of structures (for example, piers and culverts), fill, or other materials in the waterbody; and
- Removal of temporary crossing structures.

Direct effects on fish habitat from work in a waterbody during construction have the potential to affect fish and fish habitat through the following:

- Changes in the waterbody bed (from disturbance);
- Changes in food supply (in other words, effects on benthic invertebrate communities);
- Changes in flows from the installation of isolation structures during in-water construction;
- Changes in the composition and size of bed material; and / or
- Changes in the bank configuration or materials.

Direct habitat effects can include alteration or loss of specific habitat features, such as pools, aquatic vegetation, and bed materials that ultimately lead to loss or impairment of habitat functions, such as overwintering, spawning, and rearing habitat for fish or lower trophic levels. These direct habitat effects may result in changes in the food supply, which may be reflected in altered fish community structure and productivity.

Aroland First Nation noted concerns associated with how Lake Sturgeon might be impacted by new watercourse crossings, noting that the species is sensitive to habitat disturbances (Shared Value Solutions, 2024).

Along the Preferred Route, a total of approximately 8.3 hectares of aquatic habitat will be lost or altered from the waterbody crossing structures, including 0.7 hectares of habitat lost for culverts, 1.6 hectares altered for clear span bridges, and 6.1 hectares altered for multi-span bridges. This includes approximately 2.6 hectares of habitat for Lake Sturgeon, 7.1 hectares of habitat for Walleye, 7.1 hectares of habitat for Brook Trout, 8.1 hectares of habitat for Northern Pike, 2.6 hectares of habitat for Lake Whitefish, and 6.4 hectares of habitat for Burbot could be altered or lost.

Along the temporary access roads, a total of approximately 4.4 hectares of aquatic habitat will be altered from the waterbody crossing structures, including 0.2 hectares of habitat altered for culverts, 1.7 hectares altered for clear span bridges, and 2.5 hectares altered for multi-span bridges. This includes approximately 0.2 hectares of habitat for Walleye, 0.2 hectares of habitat for Brook Trout, 0.3 hectares of habitat for Northern Pike, and 0.1 hectares of habitat for Burbot could be altered or lost. No habitat for Lake Sturgeon or Lake Whitefish was present on the temporary access roads.

This may include a loss of gravel spawning habitat for the valued component fish species such as Brook Trout, Walleye, Burbot, or Lake Sturgeon, a loss of shoal spawning habitat for the valued component fish species such as Lake Whitefish, or a loss of aquatic vegetation spawning habitat for fish species that spawn in aquatic vegetation such as Northern Pike.

The effects depend on the types of habitat at the crossing site, the type of crossing structure used, and the timing of the construction. If work is required below the high-water mark (for example, installation of fill or a culvert), work may temporarily or permanently affect the section of fish habitat where the work below the high-water mark is located. Additionally, fish communities can be negatively affected by in-water work that occurs during certain periods in their life history or at certain life stages; for example, this can include movements to spawning areas, spawning and egg incubation, or eggs and newly hatched fry.

9.3.3.3.1.2 Mitigation and Enhancement Measures

Mitigation and enhancement measures and best management practices that will be implemented during construction are as follows:

- General:
  - Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project including those issued from Fisheries and Oceans Canada (a Request for Review will be prepared for Fisheries and Oceans Canada. Fisheries and Oceans Canada will determine whether to provide a Letter of Advice or if a *Fisheries Act* Authorization is required) and the Ministry of Natural Resources (permits will be required from the Ministry of Natural Resources under the Lakes and Rivers Improvement Act).
  - Where feasible, areas of sensitive fish habitat and fishing areas that have been identified through the Indigenous Knowledge program in pre-construction design will be avoided.
  - Limit the Project footprint to the extent feasible.
  - Use existing access roads where possible, recognizing that existing access is limited.
  - Complete work as quickly as possible to shorten the duration of disturbance.
  - Decommission and rehabilitate temporary access roads, staging areas, camps, and debris and / or timber stockpiles following Construction, where not needed for operations activities.
- Waterbody crossings:
  - Design permanent waterbody crossing structures to accommodate climate change considerations.
  - Use existing waterbody crossing structures where possible. Minimize the number of waterbody crossings required for the Project.
  - During detail design, complete site-specific fish and fish habitat and surface water surveys to support engineering and Fisheries and Oceans Canada and the Ministry of Natural Resources permitting at waterbody crossings where work below the high-water mark is proposed. Submit designs of waterbody crossings as required for permit applications to Fisheries and Oceans Canada and the Ministry of Natural Resources. Surveys may also be required at select sites where work above the high-water mark is proposed based on Fisheries and Oceans Canada and the Ministry of Natural Resources permitting requirements.

- Have Environmental Monitors and Indigenous Environmental Monitors on site during construction to confirm that waterbodies crossed by the Preferred Route right-of-way and access roads have been identified and documented in the waterbody crossing list. The Environmental Monitors will monitor the installation, use, and removal of waterbody crossing structures. The Environmental Monitors will confirm that the appropriate waterbody crossing structure is being used and that the required Fisheries and Oceans Canada and the Ministry of Natural Resources approvals and permits are in place.
- If new waterbodies are identified prior to construction, contract an Aquatics Specialist to assess the waterbody. Depending on the nature of the waterbody, recommendations for construction methods, appropriate mitigation and enhancement measures, and permitting requirements will be made by the Aquatics Specialist and, if necessary, local First Nation communities and appropriate regulatory agencies including Fisheries and Oceans Canada and the Ministry of Natural Resources will be engaged. This will allow for the appropriate mitigation and enhancement measures to be implemented during construction at each waterbody crossing at a site-specific level, which will reduce or avoid potential effects on habitat quantity and quality. If new waterbodies are identified during construction, clearly flag the waterbody and suspend activity within 30 metres of the location until an Aquatic Specialist has assessed the waterbody and determined a suitable course of action, which may include contacting Fisheries and Oceans Canada and the Ministry of Natural Resources.
- Construct waterbody crossings in a manner that maintains downstream flows and fish passage and follows conditions of permits or authorizations issued for the Project by Fisheries and Oceans Canada and the Ministry of Natural Resources.
- Construct, operate, remove, decommission, and rehabilitate waterbody crossing structures, if appropriate, following best management practices and environmental approval conditions, including Ontario Provincial Standard Specification General Specification for Environmental Protection for Construction in and Around Waterbodies and on Waterbody Banks (OPSS, 2021b), Ministry of Natural Resources Environmental Guidelines for Access Roads and Water Crossings (Ministry of Natural Resources and Forestry, 1990) and Fisheries and Oceans Canada's Measures to Protect Fish and Fish Habitat (Fisheries and Oceans Canada, 2025a) and Standards and Codes of Practice (Fisheries and Oceans Canada, 2025b).

  - Avoid constructing in sensitive habitats (for example, spawning areas and groundwater upwellings) where feasible.
  - Construct or install waterbody crossing structures in a manner that protects the banks from erosion, maintains downstream flows in the waterbody, and follows the requirements of permits or authorizations issued for the Project from Fisheries and Oceans Canada and the Ministry of Natural Resources.
  - Fording of a waterbody is not permitted, unless approved by the Ministry of Natural Resources and Fisheries and Oceans Canada. As per Fisheries and Oceans Canada's Codes of Practice (Fisheries and Oceans Canada, 2025b), limit fording to a one-time event (over and back) and use only if an existing crossing at another location is not available or practical to use. If repeated crossings of the waterbody are required, a crossing structure will be installed. Permits are expected to be required from Ministry of Natural Resources for any use of a ford.

- Instream Construction:
  - Complete instream construction in isolation of flowing water (in other words, use isolation methods for the installation and removal of culverts where surface water exists at the time of construction).
  - For isolations / diversions, maintain 100 percent downstream flow.
  - Use erosion-resistant fill material below the high-water level within the floodplain of a waterbody.
  - Upon removal of the temporary crossing materials, return the waterbody banks to their original profile if needed and stabilize and revegetate disturbed areas, as necessary, to prevent soil erosion.
  - Locate temporary access roads, staging areas, camps, and debris and / or timber stockpiles a minimum of 30 metres away from the ordinary high-water mark of a waterbody, where possible.
- Restricted Activity Timing Window:
  - Avoid construction during a fish and fish habitat restricted activity timing window, where feasible. Work may not be conducted during the proposed restricted activity timing window unless approval is obtained from the Ministry of Natural Resources and Fisheries and Oceans Canada. Proposed restricted activity timing windows were assigned to avoid work during sensitive life history periods or life stages for all fish that may be present in each waterbody, including movements to spawning areas, spawning and egg incubation, or eggs and newly hatched fry. The restricted activity timing

windows for each waterbody crossing will be finalized by the Ministry of Natural Resources during permitting.

  - For permanent and temporary waterbody crossing structures, the proposed restricted activity timing window will be applicable if:
    - Any work is completed below the high-water mark (for example, installation or removal of fill or culverts, bridge supports below the high-water mark, one-time ford).
    - The waterbody is frozen and an ice bridge / snow fill is constructed.
    - Beaver dam removals are required.
  - For permanent and temporary waterbody crossing structures, the proposed restricted activity timing window will not be applicable:
    - If all work is completed above the high-water mark (for example, installation or removal of a clear span bridge with no fill or supports below the high-water mark).
    - If work is completed below the high-water mark and approval is obtained from Ministry of Natural Resources and Fisheries and Oceans Canada prior to construction.
    - When using the existing and installed waterbody crossing structures, where no modifications are required.

- Riparian Vegetation:
  - Maintain buffer zones of 30 metres around waterbodies and limit clearing of riparian vegetation to the extent practical and to the requirement of the access road and alignment clearing width only.
- Sediment and Erosion Control:
  - Install, monitor, and manage appropriate erosion and sedimentation control measures to minimize or avoid sediment mobilization from the disturbed area to drainages or waterbodies and in accordance with Ontario Provincial Standard Specifications Construction Specification for Temporary Erosion Control (OPSS, 2021a) and Construction Specification for Temporary Sediment Control (OPSS, 2020). Adequate and appropriate erosion and sedimentation control materials will be on site and available prior to commencement of construction.

9.3.3.3.1.3 Residual Effects

Changes in fish habitat quantity and quality through physical alteration of waterbodies in Construction will be minimized by effective implementation of the mitigation and enhancement measures. However, changes in fish habitat quantity and quality through physical alteration of waterbodies are predicted to occur, as for some crossings, the waterbody crossing may be installed below the high-water mark and potentially occur in the restricted activity timing window. Therefore, changes in fish habitat quantity and quality through physical alteration of waterbodies was predicted to result in a residual effect during construction and this interaction was carried forward to the residual effects characterization.

Physical alteration of the waterbodies is expected to result in minor effects on fish habitat quantity or quality with effective implementation of mitigation and enhancement measures. Habitat of the valued component fish species (Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot) is anticipated to remain stable and functional but there may be a minor decrease in productivity from physical alteration of the waterbodies. However, the valued component fish species populations are anticipated to remain self-sustaining and ecologically effective. As a result, no effects on aquatic biodiversity would be expected.

9.3.3.3.2 Changes to Fish Habitat Quantity and Quality Through Changes to Riparian Vegetation

9.3.3.3.2.1 Potential Effects

During construction, riparian vegetation will be cleared along the Community Access Road right-of-way and temporary access roads. Mechanical or chemical clearing or removal of riparian vegetation has the potential to directly and indirectly affect fish habitat during construction through the following:

- Changes in water temperature (from reduced shading);
- Changes in food supply (plants and organic debris that fall into the waterbody [allochthonous inputs]);
- Changes in light levels in water (from removed riparian vegetation);
- Changes in habitat structure and cover (change in channel stability, overhead cover, inputs of woody debris); and
- Change in sediment concentrations (from increased runoff and erosion; addressed in **Section 9.3.3.3.3.3**).

Studies have shown increases in temperatures in watercourses and lakes near extensive forest harvesting operations (for example, Holtby, 1988; Macdonald et al., 2003; Steedman et al., 2001; Johnson and Jones, 2000). Changes in allochthonous inputs may decrease the amount of habitat structure for aquatic organisms, change the sediment and nutrient concentrations, and decrease the food supply (Fisheries and Oceans Canada, 2025a). The Ministry of Natural Resources (2010b) indicates that changes to riparian vegetation have the greatest potential to influence water temperatures and allochthonous inputs for watercourses less than 12 metres wide. Woody debris provides habitat for fish by slowing water flow, creating backwater areas, and providing cover. Bank stability is promoted by the presence of woody debris.

In total, approximately 2.6 hectares of habitat for Lake Sturgeon, 7.3 hectares of habitat for Walleye, 7.3 hectares of habitat for Brook Trout, 8.4 hectares of habitat for Northern Pike, 2.6 hectares of habitat for Lake Whitefish, and 6.5 hectares of habitat for Burbot could be altered or lost along the Preferred Route and temporary access roads.

9.3.3.3.2.2 Mitigation and Enhancement Measures

In addition to the general and riparian vegetation construction phase mitigation and enhancement measures and best management practices outlined in **Table 9.3-7**. The following mitigation and enhancement measures and best management practices will be implemented during construction:

- Riparian Vegetation:
  - Clear and revegetate the riparian zone, including above and below the high-water mark, following Ontario Provincial Standard Specification General Specification for Environmental Protection for Construction in and Around Waterbodies and on Waterbody Banks (OPSS, 2021b), Fisheries and Oceans Canada's Measures to Protect Fish and Fish Habitat (2025a) and the Ministry of Natural Resources and Forestry's Environmental Guidelines for Access Roads and Water Crossings (1990), and Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales (2010a) and its associated Background Rationale document (2010b).
  - Maintain a 30 metres riparian buffer around waterbodies, where feasible.
  - Use mechanical or manual methods to clear vegetation around sensitive areas (for example, waterbodies, wetlands and muskeg) during construction of the Community Access Road. Do not use herbicides.
  - Consider the restricted activity timing windows for the timing of clearing riparian vegetation.

In Ontario Provincial Standard Specification General Specification for Environmental Protection for Construction in and Around Waterbodies and on Waterbody Banks (OPSS, 2021b), the riparian buffer is defined as trees, shrubs and other vegetation on waterbody bank from the high-water level upland for 30 metres. However, in the Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales (Ministry of Natural Resources and Forestry, 2010a), the recommended riparian buffer (called the area of concern) varies from 30 to 90 metres depending on the slope of the land adjacent to waterbodies. This is measured from the edge of the vegetation communities capable of providing an effective barrier to the movement of sediment (Ministry of Natural Resources and Forestry, 2010a). The 30 metre setback from the ordinary high-water mark was selected based on Ontario Provincial Standard Specification General Specification for Environmental Protection for Construction in and Around Waterbodies and on Waterbody Banks (OPSS, 2021b), best management practices and the mitigation and enhancement measures that will be in place for the Project. The recommended riparian buffer to maintain aquatic resources and functions varies in literature; however, a 30 metre riparian buffer is considered sufficient to reduce or avoid effects on bank stability, maintain benthic communities, and protect fish habitat (Environment Canada, 2013; The District of Muskoka Planning and Economic Development Department, 2003; and the references cited within). During detail design, the riparian buffer may be increased around certain waterbodies with a high slope if it is determined to be suitable or necessary to protect the waterbody from sediment mobilization.

Clearing activities at some crossings may be subject to the restricted activity timing window. Proposed restricted activity timing windows were assigned to avoid work during sensitive life history periods or life stages for all fish that may be present in each waterbody, including movements to spawning areas, spawning and egg incubation, or eggs and newly hatched fry. The restricted activity timing windows for each waterbody crossing will be finalized by the Ministry of Natural Resources during permitting, and the application of the restricted activity timing window for riparian clearing activities at crossings will be determined by the Ministry of Natural Resources and Fisheries and Oceans Canada during permitting.

9.3.3.3.2.3 Predicted Residual Effects

With the effective implementation of mitigation and enhancement measures, effects on water temperatures, allochthonous inputs, or fish habitat from changes to riparian vegetation are predicted to be minor. However, as there will be a local scale effect at some waterbody crossings, changes in riparian vegetation that may affect water temperature, food supply, light levels, and habitat structure during construction were predicted to result in a residual effect and this interaction was carried forward to the residual effects characterization.

Residual changes to riparian vegetation during construction are expected to result in negligible residual effects on fish habitat availability with effective implementation of the mitigation and enhancement measures. There is no anticipated effect on the function or productivity of the habitat from changes to riparian vegetation on the populations of valued component fish species (Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot). The valued component fish species populations are anticipated to remain self-sustaining and ecologically effective. As a result, no changes to aquatic biodiversity would be expected.

9.3.3.3.3 Changes to Fish Through Injury or Mortality of Fish from Instream Construction

9.3.3.3.3.1 Potential Effects

During instream construction of the waterbody crossings on the Community Access Road and temporary access roads, there is the potential for physical injury or mortality of fish to occur. This can occur from the operation of heavy machinery in the water or the placement of fill or other materials in the waterbody where fish are present. If required for diversions during instream construction, the use of intakes or pumps can also cause entrainment or impingement of fish. Entrainment occurs when a fish is drawn into a water intake and cannot escape. Impingement occurs when an entrapped fish is held in contact with the intake screen and is unable to free itself.

9.3.3.3.3.2 Mitigation and Enhancement Measures

In addition to construction mitigation and enhancement measures and best management practices outlined in **Table 9.3-7**, the following mitigation and enhancement measures and best management practices will be implemented during instream construction:

- For isolations / diversions, appropriately screen water intakes or pumps to prevent entrainment or impingement of fish (Fisheries and Oceans Canada, 2025a) and follow measures for design and installation of intake end of pipe fish screens to protect fish (Fisheries and Oceans Canada, 2023); and

Obtain a Licence to Collect Fish for Scientific Purposes from the Ministry of Natural Resources and have Aquatics Specialists rescue and relocate fish within the isolated workspace prior to construction in the isolated workspace.

9.3.3.3.3.3 Predicted Residual Effects

In-water work during the restricted activity timing window may result in the mortality of fish or eggs for spawning species that may use the area. Therefore, injury or mortality of

fish due to instream construction is predicted to result in a residual effect and this interaction was carried forward to the residual effects characterization.

Injury or mortality of fish from instream construction may result in a minor loss of individual fish near the work location including the valued component fish species (Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot), but measurable effects on the productivity of the waterbodies for fish are anticipated to be minor with the implementation of appropriate mitigation and enhancement measures. The valued component fish species populations are anticipated to remain self-sustaining and ecologically effective. As a result, no changes to aquatic biodiversity would be expected.

9.3.3.3.4 Changes to Fish Habitat Quality from Release of Sediment at Waterbody Crossings

9.3.3.3.4.1 Potential Effects

Increases in the concentration of suspended sediment can result directly from disturbance and resuspension of bed materials during construction of waterbody crossings or from the discharge of water to watercourses from other activities (for example, dewatering pits and quarries) or indirectly from site runoff (for example, clearing of riparian vegetation). This could increase total suspended solids and turbidity in the downstream aquatic ecosystems and result in a negative effect on surface water quality. Exposure to suspended sediment can affect the health of fish with effects ranging from minor physiological stress to mortality. The magnitude of the effect depends on a combination of the suspended sediment concentration and the duration of exposure.

Fine sediment can also result in downstream sediment deposition that alters substrate composition and modifies the suitability of habitat for fish. Deposited sediments have the potential to directly affect the availability and suitability of fish habitat by (CCME, 1999):

- Changes in aquatic plants from smothering, affecting cover and spawning and / or rearing habitat for fish;
- Changes in the bed conditions, which can reduce habitat suitability for the incubation of developing fish eggs;
- Changes in habitat from in-filling pools and reducing the size of riffle areas, consequently reducing the habitat available for juvenile and adult fish;
- Changes in habitat conditions, reducing benthic invertebrate and forage fish populations and shifting fish species composition; and
- Changes in interstitial spaces between gravel particles by in-filling, which can prevent the emergence of fry.

9.3.3.3.4.2 Mitigation and Enhancement Measures

In addition to the construction mitigation and enhancement measures and best management practices outlined in **Table 9.3-7**, the following mitigation and enhancement measures and best management practices will be implemented during construction:

- General
  - Recontour disturbed areas to restore drainage patterns and the approximate preconstruction profile; and
  - Implement the relevant mitigation and enhancement measures as described in the surface water quality assessment(Appendix F)
- Instream Construction:
  - Postpone instream construction if excessive flows or flood conditions are present or anticipated. Resume activities when water levels have subsided or equipment / techniques suitable for conditions are deployed.; and
  - To the extent practical, and while complying with all appropriate mitigation and enhancement measures, complete work below the high-water mark as quickly as possible to shorten the duration of disturbance; and
  - Construct or install waterbody crossings in a manner that protects the banks from erosion, maintains downstream flows in the waterbody, and follows permits or authorizations issued for the Project from Fisheries and Oceans Canada and the Ministry of Natural Resources; and
  - Avoid bank grading to accommodate temporary bridges where possible. Restrictions on grading may be required as part of waterbody crossing permits from Fisheries and Oceans Canada and the Ministry of Natural Resources.
- Sediment and Erosion Control:
  - Install, monitor, and manage appropriate erosion and sedimentation control measures to prevent sediment from reaching the waterbody prior to and during construction and in accordance Ontario Provincial Standard Specifications Construction Specification for Temporary Erosion Control (OPSS, 2021a) and Construction Specification for Temporary Sediment Control (OPSS, 2020);
  - Develop and follow a Sediment and Erosion Control Plan in accordance with Ontario Provincial Standard Specifications Construction Specification for Temporary Erosion Control (OPSS, 2021a) and Construction Specification for Temporary Sediment Control (OPSS, 2020); and

- Temporary erosion control measures must be:
  - Properly installed;
  - Installed before or immediately after initial disturbance; and
  - Inspected and properly maintained (for example, repaired, replaced, or supplemented with functional materials) throughout construction until permanent erosion control is established or reclamation is complete.

9.3.3.3.4.3 Predicted Residual Effects

Changes in fish habitat quality from release of sediment during road construction and land disturbance at waterbody crossings is predicted to result in a residual effect and this interaction was carried forward to the residual effects characterization.

Changes in habitat quality and associated effects on fish downstream from crossings from the release of sediment during road construction at waterbody crossings and from land disturbance are expected to result in negligible residual effects on fish and fish habitat with effective implementation of mitigation and enhancement measures. There is no anticipated effect on the function or productivity of the habitat from the changes to channel morphology on the populations of valued component fish species (Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot). The valued component fish species populations are anticipated to remain self-sustaining and ecologically effective. As a result, no changes to aquatic biodiversity would be expected.

9.3.3.3.5 Changes to Fish Habitat Quantity and Quality From Placement of Waterbody Crossing Structures and Changes in Channel Morphology

9.3.3.3.5.1 Potential Effects

Channel morphology features, such as pools, riffles, and runs, provide a variety of habitat uses for fish. During construction, changes in channel morphology and habitat use could potentially occur through alterations in the shape, stability, and bank composition. The placement of waterbody crossing structures has the potential to directly and indirectly affect fish habitat through the following:

- Changes in sediment inputs from erosion and bed and bank instabilities, upsetting the channel's ability to transport water and sediment; and
- Changes in the channel width during construction (for example, culvert installation), which could affect flow velocities that could in turn affect channel geomorphology (for example, bankfull width and depth, bed material composition, ratio of pools to riffles, and composition of riparian vegetation).

As a result, these changes in channel morphology can affect fish habitat quantity and quality and potentially fish survival, reproduction, and distribution. In total, approximately 2.6 hectares of habitat for Lake Sturgeon, 7.3 hectares of habitat for Walleye, 7.3 hectares of habitat for Brook Trout, 8.4 hectares of habitat for Northern Pike, 2.6 hectares of habitat for Lake Whitefish, and 6.5 hectares of habitat for Burbot could be altered or lost along the Preferred Route and temporary access roads.

Waterbody crossing construction may cause small-scale changes in channel morphology and the changes may occur over longer periods and might not be evident for several years after construction during operation.

9.3.3.3.5.2 Mitigation and Enhancement Measures

The Construction mitigation and enhancement measures and best management practices outlined in **Table 9.3-7** will be implemented**.**

9.3.3.3.5.3 Predicted Residual Effects

Changes to fish habitat quantity and quality from placement of waterbody structures and changes in channel morphology and crossing structures is predicted to result in a residual effect during construction and this interaction was carried forward to the residual effects characterization.

Changes in fish habitat quantity and quality from changes to channel morphology during construction from the placement of waterbody crossing structures are expected to result in negligible residual effects on fish and fish habitat with effective implementation of mitigation and enhancement measures. There is no anticipated change on the function or productivity of the habitat from the changes to channel morphology on the populations of valued component fish species (Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot). The valued component fish species populations are anticipated to remain self-sustaining and ecologically effective. As a result, no changes to aquatic biodiversity would be expected.

9.3.3.3.6 Changes to Fish Survival, Reproduction, and Distribution from the Placement of Waterbody Crossing Structures, Affecting Fish Access to Habitats

9.3.3.3.6.1 Potential Effects

Placement of waterbody crossing structures in waterbodies in Construction can cause potential changes in fish accessibility to habitat (in other words, where the crossing structure forms a barrier to fish passage), which can cause habitat fragmentation. For example, a physical or velocity barrier between rearing and spawning habitat may

remove access to habitat, resulting in loss of habitat at the crossing location and a loss of access to habitat upstream from the crossing, which can ultimately affect the stability of a self-sustaining population. Habitat fragmentation can be a concern especially where there is more than one crossing in the waterbody or if there are multiple crossings in a small watershed. Concerns relating to how the placement of waterbody crossing structures may affect fish access to habitat has been highlighted as a concern by Indigenous communities who have shared Indigenous Knowledge with respect to the Project (Firelight Research Inc., 2024).

9.3.3.3.6.2 Mitigation and Enhancement Measures

In addition to the mitigation and enhancement measures and best management practices outlined in **Table 9.3-7**, the following mitigation and enhancement measures and best management practices will be implemented during construction:

- Waterbody Crossing:
  - Where a channel allows for fish passage, design and install culverts in fish-bearing waterbodies to allow for fish passage to meet Ministry of Natural Resources Environmental Guidelines for Access Roads and Water Crossings (Ministry of Natural Resources and Forestry, 1990) and Fisheries and Oceans Canada's Standards and Code of Practices (2025c) and fish passage guidelines (Katopodis and Gervais, 2016; Di Rocco and Gervais, 2024).

9.3.3.3.6.3 Predicted Residual Effects

Changes to fish survival, reproduction, and distribution from the placement of waterbody crossing structures affecting fish access to habitats during construction is predicted to result in a residual effect and this interaction was carried forward to the residual effects characterization.

Changes in access to habitat during construction from placement of waterbody crossing are expected to result in negligible residual effects on fish and fish habitat with effective implementation of mitigation and enhancement measures. There is no anticipated effect on the function or productivity of the habitat from the changes in access to habitats on the populations of valued component fish species (Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot). The valued component fish species populations are anticipated to remain self-sustaining and ecologically effective. There are no anticipated changes to distribution or migration patterns of the valued components and therefore no changes to aquatic biodiversity.

9.3.3.3.7 Changes to Fish Habitat Quantity and Quality due to Changes in Hydrology or Groundwater That May Alter Drainage Patterns and Increase or Decrease Drainage Flows and Surface Water Levels

9.3.3.3.7.1 Potential Effects

Changes in drainage patterns and increases or decreases in drainage flows and surface water levels beyond the natural range of variation during construction could lead to changes in fish habitat quantity and quality. Groundwater baseflow is seasonally important to local waterbodies and natural environment features (for example, vegetation, fish and fish habitat, and wetlands). Construction activities, including dewatering of pits and quarries, have the potential to locally influence groundwater discharge as baseflow to these features. Changes in waterbody flow have the potential to directly and indirectly affect fish habitat through the following:

- Changes in spawning, rearing, feeding, migration, and overwintering habitat of fish-bearing waterbodies;
- Changes in the waterbody productivity and availability of food for fish (for example, benthic invertebrates);
- Changes in the presence of macrophytes, which provide cover, spawning material, or food for fish; and
- Changes in the local hydrogeological environment by increasing, decreasing, or redirecting groundwater flows, resulting in local groundwater table lowering or raising and alteration of flow pathways.

These potential changes in groundwater flow pathways are linked to surface water quantity (in other words, water levels) and subsequently fish habitat quantity and quality.

9.3.3.3.7.2 Mitigation Measures

In addition to the general construction mitigation and enhancement measures and best management practices outlined in **Table 9.3-7**, the following mitigation and enhancement measures and best management practices will be implemented during construction:

- Develop and maintain surface water management and erosion control infrastructure to minimize potential for changes to infiltration rates.
- For any water taking activities, acquire a Permit to Take Water from the Ministry of the Environment, Conservation, and Parks during detail design of the Community Access Road.
- Implement the mitigation and enhancement measures as described in the surface water quality assessment (**Appendix F**).

9.3.3.3.7.3 Predicted Residual Effects

Changes to hydrology or groundwater during construction may alter drainage patterns and increase or decrease drainage flows and surface water levels, which could affect fish habitat quantity and quality. Therefore, a residual effect is predicted, and this interaction was carried forward to the residual effects characterization.

Effects on fish habitat quantity and quality from changes to hydrology or groundwater from Construction are expected to result in negligible residual effects on fish habitat quantity and quality, including for benthic invertebrates as a food source for fish, with effective implementation of mitigation and enhancement measures. There is no anticipated effect on the function or productivity of the habitat from the changes in hydrology and groundwater on the populations of valued component fish species (Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot). The valued component fish species populations are anticipated to remain self-sustaining and ecologically effective. As a result, no changes to aquatic biodiversity would be expected.

9.3.3.3.8 Changes to Fish Through Blasting-Related Injuries or Mortality to Fish

9.3.3.3.8.1 Potential Effects

Blasting in or near water produces post-detonation compressive shock waves characterized by a rapid rise to a high peak pressure followed by a rapid decay to below ambient hydrostatic pressure. Pressure changes and vibrations caused by blasting during construction have potential to cause injury or mortality of fish in nearby waterbodies. This potential effect has been noted as a concern by Indigenous communities, including Aroland First Nation – in particular, for activities taking place in close proximity to the Painter and Anaconda Lake Road waterbody crossings, due to many overnight camp / cabin sites being located nearby (Shared Value Solutions, 2024). Post-detonation compression shock waves caused by detonations of explosives in or near water can cause internal damage to the swim bladder and other soft organs of fish and cause changes to fish behaviour (Wright, 1982; Wright and Hopky, 1998; Godard et al., 2008). The severity of effects is related to the type of explosive, method of detonation, distance away from fish, water depth, and the weight and pattern of the charge(s). The species, size, and life stage of fish also plays a role in the severity of effects of blasting. Fish eggs incubating in spawning beds near blasting zones can also be damaged by movement of the substrate in which eggs are embedded, causing mortality or disrupting development (Wright, 1982; Faulkner et al., 2008). Peak particle velocities (in other words, vibrations) can increase mortality of incubating eggs close to blasting zones (Wright, 1982). Fly rock also has the potential to alter, disrupt, or destroy fish habitat.

9.3.3.3.8.2 Mitigation and Enhancement Measures

In addition to the general construction mitigation and enhancement measures and best management practices outlined in **Table 9.3-7**, the following mitigation and enhancement measures and best management practices related to blasting will be implemented during construction:

- Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible;
- Complete blasting near fish-bearing waterbodies outside the proposed restricted activity timing window for all blasting operations;
- Prepare and implement a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (OPSS, 2014) and describes specific measures that would be implemented if blasting is required; and
- For blasting operations, follow the overpressure and vibration guidelines outlined in the Ontario Provincial Standard Specification General Specifications for the Use of Explosives (OPSS, 2014) and Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters (Wright and Hopky, 1998):
  - **Overpressure guideline**—Explosives are not to be detonated in or near fish habitat that produces, or is likely to produce, an instantaneous water pressure change (in other words, overpressure) greater than 100 kilopascals (kPa) where fish are present. The overpressure guideline applies year-round in any fish-bearing waterbody near the blast.
  - **Vibration guideline**—Explosives are not to be detonated that produce, or are likely to produce, a peak particle velocity greater than 13 millimetres per second in a spawning bed during the period of egg incubation. The vibration guideline applies during the restricted activity timing window in the waterbody near the blast.

9.3.3.3.8.3 Predicted Residual Effects

Blasting is predicted to result in no residual effect on fish habitat quantity and quality or fish survival, reproduction, and distribution in waterbodies crossed by the Project, with the effective application of mitigation and enhancement measures. Therefore, this interaction was not carried forward to the residual effects characterization.

9.3.3.3.9 Changes to Fish Habitat Quality from the Deposition of Air Contaminants and Fugitive Dust Emissions

9.3.3.3.9.1 Potential Effects

Changes to air contaminants and fugitive dust emissions resulting from the Project during construction could lead to residual changes to constituent concentrations in water in the receiving environment, which could affect fish habitat quantity and quality. This potential effect has been noted as a concern by Indigenous communities, including Aroland First Nation, Fort Albany First Nation, and Weenusk First Nation (Firelight Research Inc., 2024; MNP LPP, 2024b; Shared Value Solutions, 2024).

Construction of the Community Access Road is expected to generate air contaminants and fugitive dust emissions, with the main sources of emissions being:

- Exhaust from vehicles, construction equipment, and generators (including diesel);
- Land clearing activities and slash pile burning;
- Material handling and hauling activities including extraction, dozing, and grading;
- Travel along access roads; and
- Reclamation of temporary access roads and staging areas.

Fish are vulnerable to harm from air pollution and their responses to air pollution may differ depending on exposure and vulnerability. Air pollution can harm fish through the following:

- Changes in the quality of the habitats in which they live and the availability and quality of their food supplies (Environment and Climate Change Canada, 2012); and
- Changes in water quality, which can influence fish habitat availability and distribution, microbial activity and nutrient cycles, food webs, and ecosystem interactions from air contaminants and dust emissions and subsequent deposition (United States Fish and Wildlife Service, 1982).

Effects from air pollutants may result in widespread disruption of the structure and function of ecosystems in developed areas (United States Fish and Wildlife Service, 1982). Rates of dust deposition and accumulation are dependent on the rate of supply from the source, wind speed, precipitation events, topography, and vegetation cover.

9.3.3.3.9.2 Mitigation and Enhancement Measures

In addition to the general and riparian vegetation construction mitigation and enhancement measures and best management practices outlined in **Table 9.3-7**, the following mitigation and enhancement measures and best management practices will be implemented during construction:

- Implement the air quality mitigation and enhancement measures as described in the surface water quality assessment (**Appendix F**); and
- Burn of slash piles subject to agreements with Indigenous communities and landowners and obtainment of permits and approvals by appropriate regulatory agencies.

9.3.3.3.9.3 Predicted Residual Effects

Under existing conditions, concentrations of suspended particulate matter, nitrogen dioxide, sulphur dioxide, carbon monoxide, and particulate matter were observed to be below the relevant criteria (in other words, the lowest applicable criteria) along the Community Access Road. Predicted concentrations from Community Access Road activities in combination with background air quality are expected to be below the relevant criteria along the Community Access Road after effective implementation of standard mitigation and enhancement measures.

The surface water quality assessment (**Appendix F**) used the results from the screening level assessment of air emissions during construction to predict effects from air contaminants and fugitive dust emissions to water quality criteria; no residual effect on surface water quality is predicted. No changes to trophic status (including primary or secondary productivity) would therefore be expected.

Air contaminants and fugitive dust emissions and subsequent deposition during construction are predicted to result in no residual effect on water quality and, as a result, fish habitat quantity and quality; therefore, this interaction was not carried forward to the residual effects characterization.

9.3.3.3.10 Changes to Fish Survival and Reproduction from Improved Public Access to Recreational Angling Areas

9.3.3.3.10.1 Potential Effects

The development of the Community Access Road and permanent access roads could negatively affect the survival and reproduction of harvested valued component species through increased access to waterbodies that have harvested species such as Brook Trout, Lake Sturgeon, Walleye, Northern Pike, Lake Whitefish, or Burbot during construction.

Improved public access to recreational angling areas can affect fish survival and reproduction during operation through the following:

- Changes in harvest pressure from recreational anglers, small communities close to the Project, and from construction workers while on site; and
- Potential increased introduction or spread of invasive species and pathogens.

The construction of the Community Access Road and access roads will expand access to a broader range of individuals and groups. However, the region will remain relatively remote with the nearest urban centre (Thunder Bay with a population of approximately 110,000) being over 430 km from Marten Falls First Nation. Therefore, a large influx of recreational anglers is not expected. This is consistent with research showing that recreational fishers are less likely to travel great distances to fish (Hunt and Lester, 2009; deKerckhove et al., 2015); for example, Ontario anglers drive an average of 225 km to access fishing stocks (deKerckhove et al., 2015). Similarly, research has demonstrated that sustainable levels of recreational fishing are likely to occur in fishing locations farther than 100 km from population centres of 100,000 people, where fishing locations tend to remain relatively unexploited (Post et al., 2002, 2008); this would apply to the proposed Project location. There are also numerous accessible fisheries (high in surplus fishable production) in northern Ontario and within close proximity to Thunder Bay and Dryden (deKerckhove et al., 2015) such that there would be a low number of recreational fishers travelling to the proposed Project to find suitable fishing locations. Additionally, participation in fishing has been declining as indicated by national recreational fishing survey results from 48.8 million days fished in 1995 to 15.6 million days fished in 2020 (Ministry of Natural Resources and Forestry, 2010b and references cited within; Hunt et al., 2022), further indicating that a large influx of recreational fishers is not expected.

However, it is expected that there will be some increase in harvest pressure from recreational anglers and fishers from local communities as a result of the Project and that most of the harvest pressure from access related to the Project will be on larger waterbodies with known productive fisheries. Smaller waterbodies may experience periodic fishing activity and may be vulnerable to overharvesting, but it is likely that locations with higher value fisheries will be targeted (Hunt and Lester, 2009). It is expected that waterbodies that are likely to attract the greatest number of recreational fishers due to the Project have valued component species abundances that can support an increase in fishing pressure.

Marten Falls First Nation, Aroland First Nation and Weenusk First Nation have noted concerns related to impacts to fish related to increased harvest pressures) Marten Falls First Nation 2023; MNP LPP, 2024b; Shared Value Solutions, 2024). In particular

Marten Falls First Nation have highlighted concerns related to overfishing due to increased access to the area (MFFN, 2023). One community member from Aroland First Nation noted the following regarding this concern, “The first thing I thought about was the wilderness, the animals would be disturbed. If the road goes through there, they’re travelling routes would be disrupted. And also, their feeding might be disrupted. As for the fish, I think if they build bridges and all that, it’s easier access for humans to go harvest. To me, that would be very destructive for the wildlife and fishery." (Shared Value Solutions, 2024). Aroland First Nation noted concerns associated with how Lake Sturgeon might be impacted by increased public access resulting in additional pressures due to more people fishing in the area (Shared Value Solutions, 2024).

The lack of control in fish transport and release (Litvak and Mandrak, 1993; Drakes and Mandrak, 2014) provides opportunity for the release of non-native and / or invasive species into waterbodies. Non-native and invasive species may compete with local native fauna and the transport of boats and fish across waterbodies has the potential to introduce pathogens and diseases (Anderson et al., 2014; Killian et al., 2012).

9.3.3.3.10.2 Mitigation and Enhancement Measures

In addition to the general construction mitigation and enhancement measures and best management practices outlined in **Table 9.3-7**, the following mitigation and enhancement measures and best management practices will be implemented during construction:

- Decommission and reclaim temporary pits, quarries, and other temporary infrastructure for construction including access roads, staging areas, camps, and debris and / or timber stockpiles at the end of construction; and
- Implement best management practices and regulations outlined by the Ministry of Natural Resources to reduce the spread of invasive species.

9.3.3.3.10.3 Predicted Residual Effects

Increase in harvest pressure on waterbodies during construction is anticipated where access has been improved or created as a result of the Project, but most is expected to be on larger waterbodies with known productive fisheries. Smaller waterbodies may experience periodic fishing activity and may be vulnerable to overharvesting, but locations with higher value fisheries (for example, valued component species) offer more appeal to recreational fishers (Hunt and Lester, 2009).

Potential changes in angler pressure (including recreational tourists, construction workers, and local communities) and fish harvest will continue to be managed by the Ministry of Natural Resources and Fisheries and Oceans Canada, the government

agencies mandated to manage fisheries resources (in other words, fisheries management zones, fish restricted access timing windows, and fish catch limits). Furthermore, fishing is managed as a public resource through provincial licensing requirements and by establishing rules in terms of season length, catch limits, and catch-and-release rules for waterbodies near the Project.

As an increase to public access to fish is anticipated and, in turn, increased exploitation and potential for invasive species and disease transfer, it is predicted that a residual effect could occur and this interaction was carried forward to the residual effects characterization.

Effects on fish survival and reproduction from changes to public access to recreational fishing in Construction are expected to result in minor residual effects on fish populations with effective implementation of mitigation and enhancement measures. There may be a decrease in productivity, but the populations of the valued component fish species (Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot) are anticipated to remain functional, self-sustaining, and ecologically effective. As a result, no changes to aquatic biodiversity would be expected.

9.3.3.3.11 Changes to Fish Survival and Reproduction from Spills of Fuel or Other Materials

9.3.3.3.11.1 Potential Effects

Spills during construction that occur in high enough concentrations could directly and indirectly affect fish survival and reproduction through the following:

- Changes in water quality can cause direct acute / chronic toxicity to fish, affect reproduction survival, cause ecosystem changes and, as a result, changes in survival, reproduction, richness, diversity, and recruitment; and
- Changes in the quality of surface water, groundwater, and sediments can, in turn, affect fish reproduction and survival.

Spills are generally local in nature; however, literature has demonstrated that the introduction of deleterious materials into a waterbody can have acute and chronic effects on an ecosystem (Austin, 1999; Bucke, 1997; Crossman et al., 1974; Fitzsimons, 1995). Indigenous communities including Aroland First Nation, Marten Falls First Nation and Weenusk First Nation have also noted concerns related to impacts on fish associated with contamination (in other words, spills of fuel or other materials), particularly for Lake Sturgeon (Dillon, 2024a,b; MFFN, 2023, MNP LPP, 2024b).

9.3.3.3.11.2 Mitigation and Enhancement Measures

The following mitigation and enhancement measures and best management practices will be implemented during construction:

- Prepare and implement a Spill Prevention and Emergency Response Plan that describes specific measures that would be implemented if a spill occurred;
- Have equipment for containing spills on site. Spill response kits will be provided in fuel and hazardous materials storage and handling facilities at temporary construction camps and temporary laydown areas, in onsite work areas, and / or in vehicles and equipment, and personnel will be trained in spill response practices and procedures. Spills and leaks will be contained and cleaned up as soon as possible following incidents;
- Refuel, service, and maintain vehicles and equipment in designated areas at temporary construction camps and temporary laydown areas a minimum of 120 metres from waterbodies;
- Wash, refuel, and service machinery to prevent any deleterious substances from entering a waterbody (Fisheries and Oceans Canada, 2025a);
- Store fuel and other materials for the machinery to prevent any deleterious substances from entering a waterbody (Fisheries and Oceans Canada, 2025a);
- Register aboveground storage tanks under and in compliance with applicable federal and provincial legislation;
- Meet the Ontario Technical Standards and Safety Act, 2000 (Government of Ontario, 2000) and the Ontario *Dangerous Goods Transportation Act* (Government of Ontario, 1990) for the transportation, storage, and handling of fuels;
- Have machinery and equipment arrive on site in a clean condition and inspect and maintain routinely to avoid fluid leaks; and
- Train individuals working on site and handling hazardous materials about best practices for the transportation of dangerous goods to avoid negatively affecting fish and fish habitat by introducing hazardous materials into the environment.

9.3.3.3.11.3 Predicted Residual Effects

It is recognized that, even with the best planning and the implementation of mitigation and enhancement measures, the potential exists for accidents and malfunctions during construction. As such, measurable changes (in other words, residual effects) to surface water quality in the form of increases to the concentrations of chemical constituents in

receiving waterbodies could occur in the event of the wash-off from accidental spills or leaks to nearby waterbodies. Based on the information presented, this interaction was carried forward to the residual effects characterization.

Effects on fish survival and reproduction from changes to surface water and sediment quality from spills during construction are expected to result in negligible residual effects on fish and fish habitat with effective implementation of mitigation and enhancement measures. There is no anticipated effect on the function or productivity of the habitat on the populations of valued component fish species (Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot). The valued component fish species populations are anticipated to remain self-sustaining and ecologically effective. As a result, no changes to aquatic biodiversity would be expected.

9.3.3.4 Residual Effects – Operations Phase

9.3.3.4.1 Changes to Fish Habitat Quantity and Quality Through Physical Alterations of Waterbodies

9.3.3.4.1.1 Potential Effects

Direct and indirect effects on fish habitat quantity and quality from physical alteration of waterbodies may also occur during operation of the Community Access Road. Disturbances that may affect fish habitat directly from operation of waterbody crossings include:

- Bridge and culvert maintenance; and
- Debris removal from crossing structures.

As described above for construction, direct effects on fish habitat from work in a waterbody during operation can affect fish habitat through changes in the composition and size of bed material, changes in the bank configuration or materials, and associated changes in food supply (in other words, effects on benthic invertebrate communities). The effects depend on the habitat at the crossing site and the timing of the activities.

9.3.3.4.1.2 Mitigation and Enhancement Measures

The following mitigation and enhancement measures will be implemented during operations:

- Regularly inspect and maintain culverts and bridges to prevent blockages from forming and causing ponding or backwater effects. Where culverts and bridges are installed at fish-bearing waterbodies, follow Fisheries and Oceans Canada's Codes of Practice for debris removal activities (in other words, gradual removal

such that flooding downstream, extreme flows downstream, release of suspended sediment, and fish stranding can be avoided) (Fisheries and Oceans Canada, 2025b); and

- Operate waterbody crossing structures in consideration of best management practices and environmental approval conditions, including the Ministry of Natural Resources Environmental Guidelines for Access Roads and Water Crossings (Ministry of Natural Resources and Forestry, 1990) and Fisheries and Oceans Canada's Measures to Protect Fish and Fish Habitat (Fisheries and Oceans Canada, 2025a).

9.3.3.4.1.3 Predicted Residual Effects

Changes in fish habitat quantity and quality through physical alteration of waterbodies in operation will be minimized by effective implementation of the mitigation and enhancement measures. However, changes in fish habitat quantity and quality through physical alteration of waterbodies may occur for some crossings where removal of temporary waterbody crossing structures and debris removal may involve work below the high-water mark and potentially occur in the restricted activity timing window. Therefore, changes in fish habitat quantity and quality through physical alteration of waterbodies was predicted to result in a residual effect during operation and this interaction was carried forward to the residual effects characterization.

Physical alteration of waterbodies during operations is expected to result in negligible residual effects on fish and fish habitat with effective implementation of mitigation and enhancement measures. There is no anticipated effect on the function or productivity of the habitat from physical alteration to waterbodies during operations on the populations of valued component fish species (Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot). The valued component fish species populations are anticipated to remain self-sustaining and ecologically effective. As a result, no changes to aquatic biodiversity would be expected.

9.3.3.4.2 Changes to Fish Habitat Quantity and Quality Through Changes to Riparian Vegetation

9.3.3.4.2.1 Potential Effects

During operation, additional clearing may occur within the riparian zone from clearing vegetation on road shoulders (for example, mowing grass and removing brush and small trees). This clearing may directly and indirectly affect fish habitat through the changes described above for construction.

9.3.3.4.2.2 Mitigation and Enhancement Measures

In addition to the operations phase mitigation and enhancement measures outlined in **Section 9.3.3.3.1**, the following mitigation and enhancement measures will be implemented during operations:

- Maintain a 30 metre riparian buffer around waterbodies, where feasible; and
- Use mechanical or manual methods to clear vegetation around sensitive areas (for example, waterbodies, wetlands and muskeg) during future maintenance of the Project. Do not use herbicides.

9.3.3.4.2.3 Predicted Residual Effects

Similar to the description above for construction, there may be a local scale effect at some waterbody crossings during operation, and therefore, changes in riparian vegetation that may affect water temperature, food supply, light levels, and habitat structure were predicted to result in a residual effect and this interaction was carried forward to the residual effects characterization.

Effects on fish habitat quantity and quality through physical changes to riparian vegetation during operation are expected to be negative in direction, restricted to the Construction Disturbance Area, and with a negligible magnitude (minor change that does not reduce productivity or function). The effect is considered to be medium term and reversible, infrequent, and possible.

Residual changes to riparian vegetation during operation are expected to result in negligible residual effects on fish habitat availability with effective implementation of the mitigation and enhancement measures. There is no anticipated effect on the function or productivity of the habitat from changes to riparian vegetation on the populations of valued component fish species (Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot). The valued component fish species populations are anticipated to remain self-sustaining and ecologically effective. As a result, no changes to aquatic biodiversity would be expected.

9.3.3.4.3 Changes to Fish Habitat Quality from Release of Sediment at Waterbody Crossings

9.3.3.4.3.1 Potential Effects

Similar to construction, increases in the concentration of suspended sediment can result directly from disturbance and resuspension of bed materials during operation of waterbody crossings or indirectly from runoff. This could increase total suspended solids and turbidity in the downstream aquatic ecosystems and affect the availability and suitability of fish habitat as outlined above for construction.

9.3.3.4.3.2 Mitigation and Enhancement Measures

In addition to the operation mitigation and enhancement measures outlined in **Section 9.3.3.3.1**, the following mitigation and enhancement measures will be implemented during operation:

- Sediment and Erosion Control:
  - Install, monitor, and manage appropriate erosion and sedimentation control measures to prevent sediment from reaching the waterbody prior to and during maintenance activities; and
  - Develop and follow a Sediment and Erosion Control Plan.

9.3.3.4.3.3 Predicted Residual Effects

Similar to the description above for Construction, changes in fish habitat quality from release of sediment during operations at waterbody crossings is predicted to result in a residual effect and this interaction was carried forward to the residual effects characterization.

Changes in habitat quality and associated effects on fish downstream from crossings from the release of sediment during operations at waterbody crossings are expected to result in negligible residual effects on fish and fish habitat with effective implementation of mitigation and enhancement measures. There is no anticipated effect on the function or productivity of the habitat from the changes to channel morphology on the populations of valued component fish species (Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot). The valued component fish species populations are anticipated to remain self-sustaining and ecologically effective. As a result, no changes to aquatic biodiversity would be expected.

9.3.3.4.4 Changes to Fish Habitat Quantity and Quality From Placement of Waterbody Crossing Structures and Changes in Channel Morphology

9.3.3.4.4.1 Potential Effects

During the operation phase, changes to channel morphology from the placement of waterbody crossing structures has the potential to affect fish habitat through the following:

- Longer term changes in sediment inputs from erosion and bed and bank instabilities, upsetting the channel's ability to transport water and sediment; and

- Changes in the channel width during operations (for example, blocked culvert), which could affect flow velocities that could in turn affect channel geomorphology (for example, bankfull width and depth, bed material composition, ratio of pools to riffles, and composition of riparian vegetation).

9.3.3.4.4.2 Mitigation and Enhancement Measures

The operations phase mitigation and enhancement measures and best management practices outlined in **Table 9.3-7** will be implemented.

9.3.3.4.4.3 Predicted Residual Effects

Changes to fish habitat quantity and quality from placement of waterbody structures and changes in channel morphology and crossing structures is predicted to result in a residual effect during operations and this interaction was carried forward to the residual effects characterization.

Changes in fish habitat quantity and quality from changes to channel morphology from the operations phase of waterbody crossing structures are expected to result in negligible residual effects on fish and fish habitat with effective implementation of mitigation and enhancement measures. There is no anticipated change on the function or productivity of the habitat from the changes to channel morphology on the populations of valued component fish species (Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot). The valued component fish species populations are anticipated to remain self-sustaining and ecologically effective. As a result, no changes to aquatic biodiversity would be expected.

9.3.3.4.5 Changes to Fish Survival, Reproduction, and Distribution from the Placement of Waterbody Crossing Structures, Affecting Fish Access to Habitats

9.3.3.4.5.1 Potential Effects

Waterbody crossing structures can also cause a barrier during operations from blockages or changes to the structure over time.

9.3.3.4.5.2 Mitigation and Enhancement Measures

The operations phase mitigation and enhancement measures and best management practices outlined in **Section 9.3.3.3.1** will be implemented.

9.3.3.4.5.3 Predicted Residual Effects

Changes to fish survival, reproduction, and distribution from the placement of waterbody crossing structures affecting fish access to habitats during operations is predicted to result in a residual effect and this interaction was carried forward to the residual effects characterization.

Changes in access to habitat during operations are expected to result in negligible residual effects on fish and fish habitat with effective implementation of mitigation and enhancement measures. There is no anticipated effect on the function or productivity of the habitat from the changes in access to habitats on the populations of valued component fish species (Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot). The valued component fish species populations are anticipated to remain self-sustaining and ecologically effective. There are no anticipated changes to distribution or migration patterns of the valued components and therefore no changes to aquatic biodiversity.

9.3.3.4.6 Changes to Fish Habitat Quantity and Quality due to Changes in Hydrology or Groundwater That May Alter Drainage Patterns and Increase or Decrease Drainage Flows and Surface Water Levels

9.3.3.4.6.1 Potential Effects

Changes in drainage patterns and drainage flows and surface water levels beyond the natural range of variation during operations could also lead to changes in fish habitat quantity and quality. For example, ponding and backwater effects could occur from blockages of culverts.

9.3.3.4.6.2 Mitigation and Enhancement Measures

The operations phase mitigation and enhancement measures and best management practices outlined in **Table 9.3-7** will be implemented.

9.3.3.4.6.3 Predicted Residual Effects

Changes to hydrology or groundwater during operations may alter drainage patterns and increase or decrease drainage flows and surface water levels, which could affect fish habitat quantity and quality. Therefore, a residual effect is predicted and this interaction was carried forward to the residual effects characterization.

Effects on fish habitat quantity and quality from changes to hydrology or groundwater from construction are expected to result in negligible residual effects on fish habitat quantity and quality, including for benthic invertebrates as a food source for fish, with effective implementation of mitigation and enhancement measures. There is no

anticipated effect on the function or productivity of the habitat from the changes in hydrology and groundwater on the populations of valued component fish species (Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot). The valued component fish species populations are anticipated to remain self-sustaining and ecologically effective. As a result, no changes to aquatic biodiversity would be expected.

9.3.3.4.7 Changes to Fish Through Blasting-Related Injuries or Mortality to Fish

9.3.3.4.7.1 Potential Effects

Blasting in pits and quarries during operations may cause blasting-related injuries or mortality to fish as described above for construction.

9.3.3.4.7.2 Mitigation and Enhancement Measures

In addition to the operations phase mitigation and enhancement measures and best management practices outlined in **Table 9.3-7**, the mitigation and enhancement measures and best management practices outlined in **Section 9.3.3.3.8.2** for blasting during construction will be implemented during the operation phase.

9.3.3.4.7.3 Predicted Residual Effects

Blasting is predicted to result in no residual effect on fish habitat quantity and quality or fish survival, reproduction, and distribution in waterbodies crossed by the Project, with the effective application of all mitigation and enhancement measures. Therefore, this interaction was not carried forward to the residual effects characterization.

9.3.3.4.8 Changes to Fish Habitat Quality from the Deposition of Air Contaminants and Fugitive Dust Emissions

9.3.3.4.8.1 Potential Effects

Changes to air contaminants and fugitive dust emissions from the operations phase could also lead to residual changes to constituent concentrations in water in the receiving environment, which could affect fish habitat quantity and quality. The operations phase of the Community Access Road is expected to generate air contaminants and fugitive dust emissions, with the main sources of emissions being:

- Exhaust from vehicles and operations equipment;
- Travel along access roads and the Community Access Road; and
- Reclamation of temporary access roads and staging areas that may occur during operations.

9.3.3.4.8.2 Mitigation and Enhancement Measures

In addition to the operations phase mitigation and enhancement measures outlined in **Section 9.3.3.4.1**, the following mitigation and enhancement measures will be implemented during operations:

- Prepare and implement a Dust / Air Quality Management Plan for operations; and
- Implement dust-control practices (for example, wetting with water and implementation of speed limits), as required.

9.3.3.4.8.3 Predicted Residual Effects

Air contaminants and fugitive dust emissions and subsequent deposition during operations are predicted to result in no residual effect on water quality and, as a result, fish habitat quantity and quality; therefore, this interaction was not carried forward to the residual effects characterization.

9.3.3.4.9 Changes to Fish Survival and Reproduction from Improved Public Access to Recreational Angling Areas

In addition to the operations mitigation and enhancement measures outlined in **Section 9.3.3.4.1**, the following mitigation and enhancement measures will be implemented during operations:

- Prepare and implement a Dust / Air Quality Management Plan for operations; and
- Implement dust-control practices (for example, wetting with water and implementation of speed limits), as required.

9.3.3.4.9.1 Potential Effects

The ongoing operations phase of the Community Access Road may continue to allow increased harvest pressure from recreational anglers and fishers from small communities close to the Community Access Road.

9.3.3.4.9.2 Mitigation and Enhancement Measures

The operations phase mitigation and enhancement measures and best management practices outlined in **Table 9.3-7** will be implemented.

9.3.3.4.9.3 Residual Effects

A continued increase in harvest pressure on waterbodies during operations is also anticipated where access has been improved or created as a result of the Project. As a result, it is predicted that a residual effect could occur and this interaction was carried forward to the residual effects characterization.

Effects on fish survival and reproduction from changes to public access to recreational fishing in the operations phase are expected to result in minor residual effects on fish populations with effective implementation of mitigation and enhancement measures. There may be a decrease in productivity, but the populations of the valued component fish species (Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot) are anticipated to remain functional, self-sustaining, and ecologically effective. As a result, no changes to aquatic biodiversity would be expected.

9.3.3.4.10 Changes to Fish Survival and Reproduction from Spills of Fuel or Other Materials

9.3.3.4.10.1 Potential Effects

Spills during operations could also lead to changes in could affect fish survival and reproduction. As described above for construction, Spills are generally local in nature; however, literature has demonstrated that the introduction of deleterious materials into a waterbody can have acute and chronic effects on an ecosystem (Austin, 1999; Bucke, 1997; Crossman et al., 1974; Fitzsimons, 1995). Indigenous communities including Aroland First Nation and Marten Falls First Nation have also noted concerns related to impacts on fish associated with contamination (in other words, spills of fuel or other materials), particularly for Lake Sturgeon (Dillon, 2024a,b; MFFN, 2023).

9.3.3.4.10.2 Mitigation and Enhancement Measures

The following mitigation and enhancement measures will be implemented during operations:

- Meet the Ontario Technical Standards and Safety Act, 2000 (Government of Ontario, 2000) and the Ontario *Dangerous Goods Transportation Act*, 1992 (Government of Ontario, 1990) for the transport, storage, and handling of fuels required for maintenance;
- Have machinery and equipment arrive on site in a clean condition and inspect and maintain routinely to avoid fluid leaks during maintenance; and
- Use mechanical or manual methods to clear vegetation. Do not use herbicides.

9.3.3.4.10.3 Residual Effects

It is recognized that, even with the best planning and the implementation of mitigation and enhancement measures, the potential exists for accidents and malfunctions during operations. As such, measurable changes (in other words, residual effects) to surface water quality in the form of increases to the concentrations of chemical constituents in receiving waterbodies could occur in the event of the wash-off from accidental spills or leaks to nearby waterbodies. Based on the information presented, this interaction was carried forward to the residual effects characterization.

Effects on fish survival and reproduction from changes to surface water and sediment quality from spills during construction are expected to result in negligible residual effects on fish and fish habitat with effective implementation of mitigation and enhancement measures. There is no anticipated effect on the function or productivity of the habitat on the populations of valued component fish species (Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot). The valued component fish species populations are anticipated to remain self-sustaining and ecologically effective. As a result, no changes to aquatic biodiversity would be expected.

9.3.3.5 Summary of Residual Effects

Table 9.3-7 provides a summary of the potential effects for fish and fish habitat, mitigation measures, and residual effects. Detailed information is included in **Appendix G**.

Table 9.3-7: Summary of Residual Effects for Fish and Fish Habitat and Characterization

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot**	• Clearing of the right-of-way • Constructing the Community Access Road • Constructing bridges and installing culverts • Constructing, operating, and decommissioning temporary infrastructure for construction including access roads, staging areas, camps, and debris and / or timber stockpiles	• Construction	• Changes to fish habitat quantity and quality through physical alterations of waterbodies	• Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Fisheries and Oceans Canada (a Request for Review will be prepared for Fisheries and Oceans Canada). Fisheries and Oceans Canada will determine whether to provide a Letter of Advice or if a *Fisheries Act* Authorization is required) and the Ministry of Natural Resources (permits will be required from the Ministry of Natural Resources under the Lakes and Rivers Improvement Act). • Limit the Project footprint to the extent feasible. • Use existing access roads where possible. • Complete work as quickly as possible to shorten the duration of disturbance. • Decommission and rehabilitate temporary access roads, staging areas, camps, and debris and / or timber stockpiles following construction, where not needed for Operations activities. • Design permanent waterbody crossing structures to accommodate climate change considerations. • Use existing waterbody crossing structures where possible. Minimize the number of waterbody crossings required for the Project. • During detail design, complete site-specific fish and fish habitat and surface water surveys to support engineering and Fisheries and Oceans Canada and the Ministry of Natural Resources permitting at waterbody crossings where work below the high-water mark is proposed. Submit designs of waterbody crossings as required for permit applications to Fisheries and Oceans Canada and the Ministry of Natural Resources. Surveys may also be required at select sites where work above the high-water mark is proposed based on Fisheries and Oceans Canada and the Ministry of Natural Resources permitting requirements. • Have Environmental Monitors and Indigenous Environmental Monitors onsite during construction to confirm that all waterbodies crossed by the Preferred Route right-of-way and access roads have been identified and documented in the waterbody crossing list. The Environmental Monitors will monitor the installation, use, and removal of waterbody crossing structures. The Environmental Monitors will confirm that the appropriate waterbody crossing structure is being used and that the	• Residual changes to fish habitat quantity and quality through physical alteration of waterbodies	• Context: Ecological • Direction: Neutral where proposed work is above the high-water mark • Magnitude: Not applicable • Geographic Extent: Not applicable • Duration: Not applicable • Frequency: Not applicable • Reversibility: Not applicable • Probability: Not applicable • Significance: Not applicable • Uncertainty: Not applicable • Direct / Indirect: Not Appliable • Context: Ecological • Direction: Negative where proposed work is below the high-water mark • Magnitude: Low • Geographic Extent: Construction Disturbance Area • Duration: Short to medium term for temporary waterbody crossings; Long term for permanent waterbody crossings • Frequency: Infrequent • Reversibility: Reversible for temporary waterbody crossings; Irreversible for permanent waterbody crossings • Probability: Unlikely (work above the high-water mark); Certain (work below the high-water mark) • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Direct and Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				required Fisheries and Oceans Canada and the Ministry of Natural Resources approvals and permits are in place. • If new waterbodies are identified prior to construction, contract an Aquatics Specialist to assess the waterbody. Depending on the nature of the waterbody, recommendations for construction methods, appropriate mitigation and enhancement measures, and permitting requirements will be made by the Aquatics Specialist and, if necessary, local First Nation communities and appropriate regulatory agencies including the Ministry of Natural Resources and Fisheries and Oceans Canada will be engaged. This will allow for the appropriate mitigation and enhancement measures to be implemented during construction at each waterbody crossing at a site-specific level, which will reduce or avoid potential effects on habitat quantity and quality. If new waterbodies are identified during construction, clearly flag the waterbody and suspend activity within 30 metres of the location until an Aquatic Specialist has assessed the waterbody and determined a suitable course of action, which may include contacting Fisheries and Oceans Canada and the Ministry of Natural Resources. • Construct waterbody crossings in a manner that maintains downstream flows and fish passage and follows conditions of permits or authorizations issued for the Project by Fisheries and Oceans Canada and the Ministry of Natural Resources. • Construct, operate, remove, decommission, and rehabilitate all waterbody crossing structures, if appropriate, following best management practices and environmental approval conditions, including the General Specification for Environmental Protection for Construction in and Around Waterbodies and on Waterbody Banks (Ministry of Transportation, 2021b), Environmental Guidelines for Access Roads and Water Crossings (Ministry of Natural Resources, 2019), Measures to Protect Fish and Fish Habitat (2025a), and Standards and Codes of Practice (2025c). • Avoid constructing in sensitive habitats (for example, spawning areas, groundwater upwellings) where feasible. • Construct or install waterbody crossing structures in a manner that protects the banks from erosion, maintains downstream flows in the waterbody, and follows permits or authorizations issued for the Project from Fisheries and Oceans Canada and the Ministry of Natural Resources. • Fording of a waterbody is not permitted, unless approved by the Ministry of Natural Resources and Fisheries and Oceans Canada. As per the Fisheries and Ocean Canada's		

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				Code of Practice (2025b), limit fording to a one-time event (over and back) and use only if an existing crossing at another location is not available or practical to use. If repeated crossings of the waterbody are required, a crossing structure will be installed. Permits are expected to be required from Ministry of Natural Resources for any use of a ford. • Complete instream construction in isolation of flowing water (in other words, use isolation methods for the installation and removal of culverts where surface water exists at the time of construction). • For isolations / diversions, maintain 100 percent downstream flow. • Use erosion-resistant fill material below the high-water level within the floodplain of a waterbody. • Upon removal of the temporary crossing materials, return the waterbody banks to their original profile if needed and stabilize disturbed areas, as necessary, to prevent soil erosion. • Locate temporary access roads, staging areas, camps, and debris and / or timber stockpiles a minimum of 30 metres away from the ordinary high-water mark of a waterbody, where possible. • Avoid construction during a fish and fish habitat restricted activity timing window, where feasible. Work may not be conducted during the proposed restricted activity timing window unless approval is obtained from the Ministry of Natural Resources and Fisheries and Oceans Canada. Proposed restricted activity timing windows were assigned to avoid work during sensitive life history periods or life stages for all fish that may be present in each waterbody, including movements to spawning areas, spawning and egg incubation, or eggs and newly hatched fry. The restricted activity timing windows for each waterbody crossing will be finalized by the Ministry of Natural Resources during permitting. • For permanent and temporary waterbody crossing structures, the proposed restricted activity timing window will be applicable if: – Any work is completed below the high-water mark (for example, installation or removal of fill or culverts, bridge supports below the high-water mark, one-time ford). – The waterbody is frozen and an ice bridge / snow fill is constructed. – Beaver dam removals are required.		

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				• For permanent and temporary waterbody crossing structures, the proposed restricted activity timing window will not be applicable: – If all work is completed above the high-water mark (for example, installation or removal of a clear span bridge with no fill or supports below the high-water mark). – If work is completed below the high-water mark and approval is obtained from Ministry of Natural Resources and Fisheries and Oceans Canada prior to construction. – When using the existing and installed waterbody crossing structures, where no modifications are required. • Maintain buffer zones of 30 metres around waterbodies and limit clearing of riparian vegetation to the extent practical and to the requirement of the access road and alignment clearing width only. • Sediment and Erosion Control: – Install, monitor, and manage appropriate erosion and sedimentation control measures to minimize or avoid sediment mobilization from the disturbed area to drainages or waterbodies and in accordance with Ontario Provincial Standard Specifications for erosion and sediment control measures (Ministry of Transportation, 2021a, 2021c). Adequate and appropriate erosion and sedimentation control materials will be on site and available prior to commencement of construction.		
• **Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot**	• Operate the Preferred Route • Maintain the Preferred Route, permanent bridges, and culverts	• Operations	• Changes to fish habitat quantity and quality through physical alterations of waterbodies	• Regularly inspect and maintain culverts and bridges to prevent blockages from forming and causing ponding or backwater effects. Where culverts and bridges are installed at fish-bearing waterbodies, follow Fisheries and Oceans Canada's Codes of Practice for debris removal activities (in other words, gradual removal such that flooding downstream, extreme flows downstream, release of suspended sediment, and fish stranding can be avoided) (Fisheries and Oceans Canada, 2025b). • Operate waterbody crossing structures in consideration of best management practices and environmental approval conditions, including the Fisheries and Oceans Canada's Measures to Protect Fish and Fish Habitat (2025a) and Ministry of Natural Resources Environmental Guidelines for Access Roads and Water Crossings (1990).	• Residual changes to fish habitat quantity and quality through physical alteration of waterbodies	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration: Short term • Frequency: Infrequent • Reversibility: Reversable • Probability: Possible • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Direct and indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot**	• Clearing the right-of-way • Constructing the Community Access Road • Constructing bridges and install culverts • Constructing, operating, and decommissioning temporary infrastructure for construction including access roads, staging areas, camps, and debris and / or timber stockpiles	• Construction	• Changes to fish habitat quantity and quality through changes to riparian vegetation	• Follow the Construction mitigation and enhancement measures outlined in Changes to fish habitat quantity and quality through physical alterations of waterbodies. • Clear and revegetate the riparian zone, including above and below the high-water mark, following the General Specification for Environmental Protection for Construction in and Around Waterbodies and on Waterbody Banks (Ministry of Transportation, 2021b), Environmental Guidelines for Access Roads and Water Crossings (Ministry of Natural Resources, 2019), Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales (Ministry of Natural Resources, 2010a) and its associated Background and Rationale for Direction document (Ministry of Natural Resources, 2010b). • Maintain a 30 metres riparian buffer around waterbodies, where feasible. • Do not use herbicides in sensitive areas (for example, waterbodies, wetlands and muskeg) during construction of the Project. • Consider the restricted activity timing windows for waterbodies for the timing of clearing riparian.	• Residual changes to fish habitat quantity and quality through changes to riparian vegetation	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration: Medium term for temporary waterbody crossings; long term for permanent waterbody crossings • Frequency: Infrequent • Reversibility: Reversible for temporary waterbody crossings; irreversible for permanent waterbody crossings • Probability: Possible • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Direct and indirect
• **Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot**	• Operate the Preferred Route • Maintain the Preferred Route, permanent bridges, and culverts	• Operations	• Changes to fish habitat quantity and quality through changes to riparian vegetation	• Follow the operations phase mitigation and enhancement measures outlined in changes to fish habitat quantity and quality through physical alterations of waterbodies. • Maintain a 30 metres riparian buffer around waterbodies, where feasible. • Do not use herbicides	• Residual changes to fish habitat quantity and quality through changes to riparian vegetation	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration: Medium term • Frequency: Infrequent • Reversibility: Reversible • Probability: Possible • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Direct and indirect
• **Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot**	• Clearing the right-of-way • Constructing the Community Access Road • Constructing bridges and install culverts • Constructing, operating, and decommissioning temporary infrastructure for construction including access roads, staging areas, camps, and debris and / or timber stockpiles	• Construction	• Injury or mortality of fish from instream construction	• Follow the Construction mitigation and enhancement measures outlined in Changes to fish habitat quantity and quality through physical alterations of waterbodies. • Instream Construction: – For isolations / diversions, appropriately screen water intakes or pumps to prevent entrainment or impingement of fish (Fisheries and Oceans Canada, 2025a) and follow measures for design and installation of intake end of pipe fish screens to protect fish (Fisheries and Oceans Canada, 2025a). – Obtain a Licence to Collect Fish for Scientific Purposes from the Ministry of Natural Resources and have Aquatics Specialists rescue and relocate fish within the isolated workspace prior to construction in the isolated workspace.	• Residual injury or mortality of fish from instream construction	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration: Short term • Frequency: Infrequent • Reversibility: Irreversible • Probability: Possible • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot**	• Clearing the right-of-way • Constructing the Community Access Road • Constructing bridges and install culverts • Constructing, operating, and decommissioning temporary infrastructure for construction including access roads, staging areas, camps, and debris and / or timber stockpiles	• Construction	• Changes in habitat quality from release of sediment at waterbody crossings	• Follow the construction mitigation and enhancement measures outlined in Changes to fish habitat quantity and quality through physical alterations of waterbodies and Changes to fish habitat quantity and quality through changes to riparian vegetation. • Implement the relevant mitigation and enhancement measures as described in the surface water quality assessment. A fulsome list of all mitigation and enhancement measures have all been compiled for ease of review in Appendix AA. • Recontour disturbed areas to restore drainage patterns and the approximate preconstruction profile. • Postpone instream construction if excessive flows or flood conditions are present or anticipated. Resume activities when water levels have subsided or equipment / techniques suitable for conditions are deployed. • To the extent practical, and while complying with all appropriate mitigation and enhancement measures, complete work below the high-water mark as quickly as possible to shorten the duration of disturbance. • Construct or install waterbody crossings in a manner that protects the banks from erosion, maintains downstream flows in the waterbody, and follows permits or authorizations issued for the Project from Fisheries and Oceans Canada and the Ministry of Natural Resources. • Avoid bank grading to accommodate temporary bridges where possible. Restrictions on grading may be required as part of waterbody crossing permits from Fisheries and Oceans Canada and the Ministry of Natural Resources. • Install, monitor, and manage appropriate erosion and sedimentation control measures to prevent sediment from reaching the waterbody prior to and during construction and in accordance with Ontario Provincial Standard Specifications for erosion and sediment control measures (Ministry of Transportation, 2021a, 2021c). • Develop and follow a Sediment and Erosion Control Plan in accordance with Ontario Provincial Standard Specifications for erosion and sediment control measures (Ministry of Transportation, 2021a, 2021c). • Temporary erosion control measures must be: – Properly installed. – Installed before or immediately after initial disturbance. – Inspected and properly maintained (for example, repaired, replaced or supplemented with functional materials) throughout construction until permanent erosion control is established or reclamation is complete.	• Residual changes in habitat quality from release of sediment land disturbance during road construction at waterbody crossings	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration: Short term • Frequency: Infrequent • Reversibility: Reversible • Probability: Unlikely where proposed work is above the high-water mark; Possible where proposed work is below the high-water mark • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot**	• Maintaining the Preferred Route, permanent bridges, and culverts	• Operations	• Changes in habitat quality from release of sediment at waterbody crossings	• Follow the operation phase and enhancement measures outlined in Changes to fish habitat quantity and quality through physical alterations of waterbodies. • Install, monitor, and manage appropriate erosion and sedimentation control measures to prevent sediment from reaching the waterbody prior to and during maintenance activities. • Develop and follow a Sediment and Erosion Control Plan.	• Residual changes in habitat quality from release of sediment land disturbance during road construction at waterbody crossings	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration: Short term • Frequency: Infrequent • Reversibility: Reversible • Probability: Unlikely • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Direct
• **Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot**	• Clearing the right-of-way • Constructing the Community Access Road • Constructing bridges and install culverts • Constructing, operating, and decommissioning temporary infrastructure for construction including access roads, staging areas, camps, and debris and / or timber stockpiles	• Construction	• Changes to fish habitat quantity and quality from the placement of waterbody crossing structures and changes in channel morphology	• Follow the construction mitigation and enhancement measures outlined in Changes to fish habitat quantity and quality through physical alterations of waterbodies and Changes in habitat quality from release of sediment land disturbance during road construction at waterbody crossings.	• Residual changes to fish habitat quantity and quality from the placement of waterbody crossing structures and changes in channel morphology	• Context: Ecological • Direction: Neutral where proposed work is above the high-water mark • Magnitude: Not applicable • Geographic Extent: Not applicable • Duration: Not applicable • Frequency: Not applicable • Reversibility: Not applicable • Probability: Not applicable • Significance: Not applicable • Uncertainty: Not applicable • Direct / Indirect: Not applicable • Context: Ecological • Direction: Negative where proposed work is below the high-water mark • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration: Medium term for temporary crossings. Long term for permanent waterbody crossings. • Frequency: Continuous • Reversibility: Reversible for temporary waterbody crossings. Irreversible for permanent waterbody crossings. • Probability: Possible • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot**	• Operate the Preferred Route • Maintain the Preferred Route, permanent bridges, and culverts	• Operations	• Changes to fish habitat quantity and quality from the placement of waterbody crossing structures and changes in channel morphology	• Follow the Operations mitigation and enhancement measures outlined in Changes to fish habitat quantity and quality through physical alterations of waterbodies.	• Residual changes to fish habitat quantity and quality from the placement of waterbody crossing structures and changes in channel morphology	• Context: Ecological • Direction: Neutral where proposed work is above the high-water mark • Magnitude: Not applicable • Geographic Extent: Not applicable • Duration: Not applicable • Frequency: Not applicable • Reversibility: Not applicable • Probability: Not applicable • Significance: Not applicable • Uncertainty: Not applicable • Context: Ecological • Direction: Negative where proposed work is below the high-water mark • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration: Short term • Frequency: Infrequent • Reversibility: Reversible • Probability: Possible • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Indirect
• **Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot**	• Clearing the right-of-way • Constructing the Community Access Road • Constructing bridges and install culverts • Constructing, operating, and decommissioning temporary infrastructure for construction including access roads, staging areas, camps, and debris and / or timber stockpiles	• Construction	• Changes to fish survival, reproduction, and distribution from the placement of waterbody crossing structures, affecting fish access to habitats	• Follow the Construction mitigation and enhancement measures outlined in Changes to fish habitat quantity and quality through physical alterations of waterbodies and Changes in habitat quality from release of sediment land disturbance during road construction at waterbody crossings. • Waterbody Crossing: • Where a channel allows for fish passage, design and install culverts in fish-bearing waterbodies to allow for fish passage to meet the Environmental Guidelines for Access Roads and Water Crossings (Ministry of Natural Resources and Forestry, 2019), Standards and Codes of Practice (Fisheries and Oceans Canada, 2024), and the fish passage guidelines (Katopodis and Gervais, 2016; Di Rocco and Gervais, 2024).	• Residual changes to fish survival, reproduction, and distribution from the placement of waterbody crossing structures, affecting fish access to habitats	• Context: Ecological • Direction: Neutral where proposed work is above the high-water mark • Magnitude: Not applicable • Geographic Extent: Not applicable • Duration: Not applicable • Frequency: Not applicable • Reversibility: Not applicable • Probability: Not applicable • Significance: Not applicable • Uncertainty: Not applicable • Direct / Indirect:

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
						• Context: Ecological • Direction: Negative where proposed work is below the high-water mark • Magnitude: Negligible • Geographic Extent: Local • Duration: Medium term • Frequency: Infrequent • Reversibility: Reversible • Probability: Possible • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Direct
• **Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot**	• Operate the Preferred Route • Maintain the Preferred Route, permanent bridges, and culverts	• Operations	• Changes to fish survival, reproduction, and distribution from the placement of waterbody crossing structures, affecting fish access to habitats	• Follow the Operations mitigation and enhancement measures outlined in Changes to fish habitat quantity and quality through physical alterations of waterbodies.	• Residual changes to fish survival, reproduction, and distribution from the placement of waterbody crossing structures, affecting fish access to habitats	• Context: Ecological • Direction: Neutral where proposed work is above the high-water mark • Magnitude: Not applicable • Geographic Extent: Not applicable • Duration: Not applicable • Frequency: Not applicable • Reversibility: Not applicable • Probability: Not applicable • Significance: Not applicable • Uncertainty: Not applicable • Direct / Indirect: Not applicable • Context: Ecological • Direction: Negative where proposed work is below the high-water mark • Magnitude: Negligible • Geographic Extent: Local • Duration: Medium term • Frequency: Infrequent • Reversibility: Reversible • Probability: Possible • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot**	• Clearing the right-of-way • Constructing the Community Access Road • Constructing bridges and install culverts • Constructing, operating, and decommissioning temporary infrastructure for construction including access roads, staging areas, camps, and debris and / or timber stockpiles	• Construction	• Changes to fish habitat quantity and quality due to changes in hydrology or groundwater that may alter drainage patterns and increase or decrease drainage flows and surface water levels	• Follow the construction mitigation and enhancement measures outlined in Changes to fish habitat quantity and quality through physical alterations of waterbodies. • Develop and maintain surface water management and erosion control infrastructure to minimize potential for changes to infiltration rates. • Implement the mitigation and enhancement measures as described in the surface water quality assessment. A fulsome list of all mitigation and enhancement measures have all been compiled for ease of review in Appendix AA.	• Residual changes to fish habitat quantity and quality due to changes in hydrology or groundwater that may alter drainage patterns and increase or decrease drainage flows and surface water levels	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration: Long term • Frequency: Infrequent • Reversibility: Irreversible • Probability: Unlikely • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Indirect
• **Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot**	• Operate the Preferred Route • Maintain the Preferred Route, permanent bridges, and culverts	• Operations	• Changes to fish habitat quantity and quality due to changes in hydrology or groundwater that may alter drainage patterns and increase or decrease drainage flows and surface water levels	• Follow the operations phase mitigation and enhancement measures outlined in Changes to fish habitat quantity and quality through physical alterations of waterbodies.	• Residual changes to fish habitat quantity and quality due to changes in hydrology or groundwater that may alter drainage patterns and increase or decrease drainage flows and surface water levels	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration: Long term • Frequency: Infrequent • Reversibility: Irreversible • Probability: Unlikely • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Indirect
• **Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot**	• Blasting rock	• Construction	• Blasting-related injuries or mortality to fish	• Follow the Construction mitigation and enhancement measures outlined in Changes to fish habitat quantity and quality through physical alterations of waterbodies. • Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads is not feasible. • Complete blasting near fish-bearing waterbodies outside the proposed restricted activity timing window for all blasting operations; • Prepare and implement a Blasting and Communication Management Plan that is in accordance with the General Specifications for the Use of Explosives (Ministry of Transportation, 2014) and describes specific measures that would be implemented if blasting is required. • For blasting operations, follow the overpressure and vibration guidelines outlined in the General Specifications for the Use of Explosives (Ministry of Transportation, 2014) and Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters (Wright and Hopky, 1998): – **Overpressure guideline**—Explosives are not to be detonated in or near fish habitat that produces, or is likely to produce, an instantaneous water pressure change (such as, overpressure) greater than 100 kilopascal where fish	• No residual effect anticipated	• No residual effect anticipated

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				are present. The overpressure guideline applies year-round in any fish-bearing waterbody near the blast. – **Vibration guideline**—Explosives are not to be detonated that produce, or are likely to produce, a peak particle velocity greater than 13 millimetres per second in a spawning bed during the period of egg incubation. The vibration guideline applies during the restricted activity timing window in the waterbody near the blast.		
• **Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot**	• Blasting rock	• Operations	• Blasting-related injuries or mortality to fish	• Follow the Operations mitigation and enhancement measures outlined in Changes to fish habitat quantity and quality through physical alterations of waterbodies. • Follow the Construction mitigation and enhancement measures outlined in Blasting-related injuries or mortality to fish.	• No residual effect anticipated	• No residual effect anticipated
• **Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot**	• Clearing the right-of-way • Constructing the Community Access Road • Constructing bridges and installing culverts • Constructing, operating, and decommissioning temporary infrastructure for construction including access roads, staging areas, camps, and debris and / or timber stockpiles	• Construction	• Changes to fish habitat quality from the deposition of air contaminants and fugitive dust emissions	• Follow the Construction mitigation and enhancement measures outlined in Changes to fish habitat quantity and quality through physical alterations of waterbodies. • Implement the air quality mitigation measures as described in surface water quality assessment (**Appendix F**). • Burn of slash piles subject to agreements with Indigenous communities, landowners, and to permits and approvals by appropriate regulatory agencies.	• No residual effect anticipated	• No residual effect anticipated
• **Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot**	• Clearing the right-of-way • Constructing the Community Access Road • Constructing bridges and installing culverts • Constructing, operating, and decommissioning temporary infrastructure for construction including access roads, staging areas, camps, and debris and / or timber stockpiles	• Operations	• Changes to fish habitat quality from the deposition of air contaminants and fugitive dust emissions	• Follow the Operations mitigation and enhancement measures outlined in Changes to fish habitat quantity and quality through physical alterations of waterbodies. • Prepare and implement a Dust / Air Quality Management Plan. • Implement dust-control practices (for example, wetting with water and implementation of speed limits), as required.	• No residual effect anticipated	• No residual effect anticipated

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot**	• Clearing the right-of-way • Constructing the Community Access Road • Constructing bridges and installing culverts • Constructing, operating, and decommissioning temporary infrastructure for construction including access roads, staging areas, camps, and debris and / or timber stockpiles	• Construction	• Changes to fish survival and reproduction from improved public access to recreational angling areas	• Follow the construction mitigation and enhancement measures outlined in Changes to fish habitat quantity and quality through physical alterations of waterbodies. • Decommission and reclaim temporary pits and quarries and the temporary infrastructure for construction including access roads, staging areas, camps, and debris and / or timber stockpiles at the end of construction. Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act*. • Implement best management practices and regulations outlined by the Ministry of Natural Resources to reduce the spread of invasive species.	• Residual changes to fish survival and reproduction from improved public access to recreational angling areas	• Context: Ecological • Direction: Negative • Magnitude: Medium • Geographic Extent: Regional • Duration: Long term • Frequency: Frequent • Reversibility: Irreversible • Probability: Possible • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Direct
• **Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot**	• Operate the Preferred Route • Maintain the Preferred Route, permanent bridges, and culverts	• Operations	• Changes to fish survival and reproduction from improved public access to recreational angling areas	• Follow the operations phase mitigation and enhancement measures outlined in Changes to fish habitat quantity and quality through physical alterations of waterbodies.	• Residual changes to fish survival and reproduction from improved public access to recreational angling areas	• Context: Ecological • Direction: Negative • Magnitude: Medium • Geographic Extent: Regional • Duration: Long term • Frequency: Frequent • Reversibility: Irreversible • Probability: Possible • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Direct
• **Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot**	• Clearing the right-of-way • Constructing the Community Access Road • Constructing bridges and installing culverts • Constructing, operating, and decommissioning temporary infrastructure for construction including access roads, staging areas, camps, and debris and / or timber stockpiles	• Construction	• Changes to fish survival and reproduction from spills of fuel or other materials	• Follow the construction mitigation and enhancement measures outlined in Changes to fish habitat quantity and quality through physical alterations of waterbodies. • Prepare and implement a Spill Prevention and Emergency Response Plan that describes specific measures that would be implemented if a spill occurred. • Have equipment for containing spills on site. Spill response kits will be provided in fuel and hazardous materials storage and handling facilities at temporary construction camps and temporary laydown areas, in onsite work areas, and / or in vehicles and equipment, and personnel will be trained in spill response practices and procedures. Spills and leaks will be contained and cleaned up as soon as possible following incidents. • Refuel, service, and maintain vehicles and equipment in designated areas at temporary construction camps and temporary laydown areas a minimum of 30 metres from waterbodies. • Wash, refuel, and service machinery to prevent any deleterious substances from entering a waterbody (Fisheries and Oceans Canada, 2025a).	• Residual changes to fish survival and reproduction from spills of fuel or other materials	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration: Short term • Frequency: Infrequent • Reversibility: Reversible • Probability: Unlikely • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				• Store fuel and other materials for the machinery in to prevent any deleterious substances from entering a waterbody (Fisheries and Oceans Canada, 2025a). • Register aboveground storage tanks under and in compliance with applicable federal and provincial legislation. • Meet Canada's *Transportation of Dangerous Goods Act* (Government of Canada, 1992) and the Ontario Technical Standards and Safety Act, 2000 (Government of Ontario, 2000) for the transportation, storage, and handling of fuels. • Have machinery and equipment arrive on site in a clean condition and inspect and maintain routinely to avoid fluid leaks. • Train individuals working on site and handling hazardous materials about best practices for the transportation of dangerous goods to avoid negatively affecting fish and fish habitat by introducing hazardous materials into the environment.		
• **Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot**	• Operate the Preferred Route • Maintain the Preferred Route, permanent bridges, and culverts	• Operations	• Changes to fish survival and reproduction from spills of fuel or other materials	• Follow the Operations mitigation and enhancement measures outlined in changes to fish habitat quantity and quality through physical alterations of waterbodies. • Meet Canada's *Transportation of Dangerous Goods Act* (Government of Canada, 1992) and the Ontario Technical Standards and Safety Act, 2000 (Government of Ontario, 2000) for the transportation, storage, and handling of fuels required for maintenance. • Have machinery and equipment arrive on site in a clean condition and inspect and maintain routinely to avoid fluid leaks during maintenance. • Use mechanical or manual methods to clear vegetation; herbicide use is not permitted around sensitive areas (for example, waterbodies, wetlands and muskeg).	• Residual changes to fish survival and reproduction from spills of fuel or other materials	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration: Short term • Frequency: Infrequent • Reversibility: Reversible • Probability: Unlikely • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Indirect

9.3.4 Groundwater and Geochemistry

9.3.4.1 Project-Environment Interactions

As a component of the effects assessment, the Project activities were reviewed to find potential environmental interactions. These interactions were then assessed for potential effect (**Table 9.3-8**).

Table 9.3-8: Project-Environment Interactions - Groundwater and Geochemistry

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• **Construction**	• Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Pits and quarries • Temporary concrete batch plants • Drilling, blasting, and / or aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, and ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, and erosion controls) • Temporary dewatering of excavations • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the Ontario *Aggregate Resources Act* • Decommissioning of temporary camps, roads, trails and staging areas	• Groundwater	• Groundwater quantity • Groundwater quality	• Changes to groundwater quantity due to short-term water takings; • Changes to groundwater quantity due to reduced or increased recharge; • Changes to groundwater quantity due to pit or quarry dewatering; • Changes to groundwater quantity due to road construction in peatland areas; • Changes to groundwater quality due to accidental spills and leaks; • Changes to groundwater quality due to construction wastes and wastewater discharges; • Changes to groundwater quality due to blasting residues; and • Changes to groundwater quality due to exposure of acid-generating or metal leaching materials.
• **Operations**	• Operate the Community Access Road • Maintain the Community Access Road	• Groundwater	• Groundwater quantity • Groundwater quality	• Changes to groundwater quantity due to short-term water takings; • Changes to groundwater quantity due to reduced or increased recharge; • Changes to groundwater quantity due to pit or quarry dewatering; • Changes to groundwater quantity due to road construction in peatland areas; • Changes to groundwater quality due to accidental spills and leaks; • Changes to groundwater quality due to blasting residues; • Changes to groundwater quality due to exposure of acid-generating or metal leaching materials; and • Changes to groundwater quality due to road maintenance.

9.3.4.2 Discipline-Specific Characteristics

In support of the residual effects characteristics described in **Section 6.7.3**, **Table 6-1**, the following groundwater and geochemistry definitions apply to the effects assessment.

Ecological and Social Context

Ecological context for groundwater considers sensitivity, resilience, and adaptive capacity, status and trends, and applicable legislation and best management practices. The current and future sensitivity and resilience of the groundwater valued component to change caused by the Community Access Road are considered and includes Indigenous Knowledge where it was available. The ecological context of the effect includes a discussion of the environmental consequences of the predicted effect.

Magnitude

When evaluating the magnitude of effects, the groundwater and geochemistry assessment considers both the proportion of the valued component affected within identified spatial boundaries and the relative effect (**Table 9.3-9**, **Table 9.3-10**).

Table 9.3-9: Groundwater Quantity Magnitude Definition

Magnitude Level	Definition	Rationale
• **Negligible**	• Range of seasonal fluctuation in groundwater levels or the predicted water balance remains within the range of natural seasonal variability.	• Monitoring wells show no discernable change to water levels, therefore there is no effect on ecological life or water well supply.
• **Low**	• Range of seasonal fluctuation in groundwater levels or the predicted water balance is marginally outside the range of natural seasonal variability (up to 20 percent higher / lower than existing condition values).	• Temporary or permanent change to water levels is discernable but water supply remains protective of ecological life and enough for existing water well supply.
• **Medium**	• Range of seasonal fluctuation in groundwater levels or the predicted water balance is modestly outside the range of natural seasonal variability (between 20 percent and 50 percent higher / lower than existing condition values).	• Temporary or permanent change to water levels is substantial but water supply remains protective of ecological life and sufficient for existing water well supply.
• **High**	• Range of seasonal fluctuation in groundwater levels or the predicted water balance is substantially outside the range of natural seasonal variability (up to over 50 percent higher / lower than existing condition values).	• Temporary or permanent change to water quantity is substantial and can potentially impair ecological use or existing water well supply.

Table 9.3-10: Groundwater Quality Magnitude Definition

Magnitude Level	Definition	Rationale
• Negligible	• There is little to no variation predicted in measurable parameters and is within the range of natural variation.	• Monitoring wells show no discernable change to water quality, therefore there is no effect on ecological life or potable use.
• Low	• There is a small variation predicted in measurable parameters, that are outside the range of natural variation and below the applicable water quality criteria or within 20 percent of existing condition values.	• Temporary effect or permanent change to water quality is discernable but remains protective of ecological life and potable water sources.
• Medium	• There is a modest variation predicted in measurable parameters, that is significantly different from existing conditions and is below the applicable water quality criteria or is between 20 to 50 percent of existing condition values.	• Temporary effect or permanent change to water quality is discernable but remains protective of ecological life and potable water sources.
• High	• There is a large variation predicted in measurable parameters, exceeds applicable water quality criteria, or is greater than 50 percent of existing condition values.	• Temporary effect or permanent change to water quality is discernable and can potentially impair ecological or potable uses of water.

9.3.4.3 Residual Effects - Construction Phase

9.3.4.3.1 Changes to Groundwater Quantity Due to Short-Term Water Takings

9.3.4.3.1.1 Potential Effects

During construction, short-term water takings from groundwater sources may be required for the installation of below ground structures, such as footings or culverts, or for water supply to temporary construction camps or temporary concrete batch plants. These water takings may cause a lowering of the local groundwater levels which could reduce the groundwater quantity available for natural receptors such as vegetation and groundwater-fed waterbodies.

9.3.4.3.1.2 Mitigation and Enhancement Measures

Any water takings of greater than 50,000 litres per day will be registered with or permitted by the Ministry of the Environment, Conservation and Parks through the Environmental Activity and Sector Registry or Permit to Take Water programs. These programs will require site-specific studies and assessments of the water takings and any potential effects and mitigation measures. During the detail design stage of the Project, the Ministry of the Environment, Conservation and Parks should be consulted to establish the permits required and the preferred permitting processes to be used by the Project.

Short-term water takings for below-ground construction purposes will be designed to remove the minimum practical water volumes to allow construction to proceed safely. The water removed from the construction area will be treated as required and returned to the local watershed and allowed to infiltrate the ground to replenish most of the groundwater volumes removed for construction. Where required, this discharge will be permitted by the Ministry of the Environment, Conservation and Parks under an Environmental Compliance Approval for sewage works. Sheet piling and other methods of reducing groundwater inflow to construction excavations will be employed where practical so that pumping of groundwater is minimized.

If groundwater is taken for the water supplies of temporary construction camps or temporary concrete batch plants, hydrogeological studies will be performed to confirm that the groundwater resources in the area are of sufficient quality and quantity for the purpose and that any adverse residual effects are avoided or mitigated. Potential mitigation measures could include treating and returning wastewater to the local environment to minimize changes to the local water balance, and use of water efficient processes, fixtures, or systems to reduce the water taking requirements. Groundwater

monitoring should be conducted where permit requirements or site-specific hydrogeological studies indicate.

9.3.4.3.1.3 Predicted Residual Effects

Based on the mitigation measures described above it is expected that the residual effects on groundwater quantity due to short-term water takings will be minimized and no residual effects are carried forward.

9.3.4.3.2 Changes to Groundwater Quantity Due to Reduced or Increased Recharge

9.3.4.3.2.1 Potential Effects

Construction of the Project will result in changes to ground cover and topography. These changes could result in groundwater recharge rates being increased or decreased, which could affect local groundwater levels. Clearing of the effects assessment Construction Disturbance Area, and construction of the road surface and temporary access roads, laydown areas, temporary construction camps, and pits and quarries, will remove much of the vegetative cover and result in gravelled surfaces placed in much of the effects assessment Construction Disturbance Area. These gravelled surfaces may result in different infiltration rates for precipitation relative to the pre-construction conditions. In places where the Project results in lower infiltration rates and higher runoff rates, the runoff may be directed to, and collected, in areas where it is allowed to infiltrate. This may keep the overall recharge rates in the area similar to pre-construction but may cause locally higher or lower rates which may affect local groundwater levels. On a larger scale, the Construction Disturbance Area (4,700 hectares) represents less than 4 percent of the area of the Regional Study Area (126,290 hectares) and any changes to infiltration and groundwater recharge are not expected to exceed seasonal variations or be measurable on the regional scale.

9.3.4.3.2.2 Mitigation and Enhancement Measures

Drainage of the Community Access Road and the temporary access roads, laydown areas, construction camps, and pits or quarries should allow for infiltration of the water to the local ground surface to maintain groundwater recharge rates similar to the surrounding undisturbed areas. Some applicable Best Management Practices for drainage management can be found in the Ontario Ministry of Transportation's Environmental Guide for Erosion and Sediment Control During Construction of Highway Projects (Ministry of Transportation, 2015) and the Ontario Ministry of Natural Resources' Environmental Guidelines for Access Roads and Water Crossings (Ministry of Natural Resources, 1990). Where treatment of runoff is required, infiltration should

only be allowed after the treatment to avoid contamination of the groundwater. Infiltration areas should not be located near slopes or sensitive vegetation communities that could be negatively impacted by raised groundwater levels. Remediation of construction sites should seek to restore the ground cover, topography, and vegetation cover of the site to match pre-disturbance conditions.

9.3.4.3.2.3 Predicted Residual Effects

Based on the mitigation measures described above it is expected that the residual effects on groundwater quantity due to reduced or increased recharge will be minimized and no residual effects are carried forward.

9.3.4.3.3 Changes to Groundwater Quantity Due to Pit or Quarry Dewatering

9.3.4.3.3.1 Potential Effects

If aggregates are extracted from below the water table at pits or quarries the local groundwater levels would be lowered either by active dewatering or dredging. Active dewatering of aggregate pits or quarries would likely take place using a sump to collect water in the bottom of the pit or quarry and pumping the water out of the sump to discharge outside the pit / quarry area. Dredging would lower groundwater levels to a lesser degree than dewatering. When aggregate material is dredged from below the water table groundwater flows into the pit to fill the volume resulting from the aggregate removal.

9.3.4.3.3.2 Mitigation and Enhancement Measures

Any aggregate pits or quarries to be developed as part of Project construction will be permitted under the Ontario *Aggregate Resources Act* (Government of Ontario, 1990). As part of the permitting, site specific technical studies will be carried out, including hydrogeological studies for aggregate pits and quarries that will extract from below the water table. These permitting studies will further assess the risks of adverse effects due to the pit / quarry operation at each proposed pit / quarry site as well as establish the rehabilitation plans for each site.

Any water takings of greater than 50,000 litres per day will be permitted by the Ministry of the Environment, Conservation and Parks through the Permit to Take Water program. The Permit to Take Water program will require site-specific studies and assessments of the water takings and any potential effects and mitigation measures to be implemented.

All water takings from Project aggregate pits and quarries should be recorded at least daily and water that is pumped out of aggregate pits and quarries should be discharged

back to the local environment and allowed to infiltrate and / or run off to a waterbody capable of incorporating the discharge. This discharge will be permitted by the Ministry of the Environment, Conservation and Parks under an Environmental Compliance Approval for sewage works. The discharge should also be treated to remove sediments and monitored to help confirm no deleterious substances are discharged to the environment. Wherever possible, if the water taking from a pit / quarry is likely to reduce water levels in an aquifer, the water discharge from the pit / quarry should be directed back to the environment in a way that allows it to recharge the affected aquifer and limits the groundwater level reductions.

Groundwater monitoring at aggregate pits and quarries that extend below the water table should be carried out in accordance with the monitoring plans and any permit requirements.

9.3.4.3.3.3 Predicted Residual Effects

With the application of the above mitigation and enhancement measures it is expected that the residual effects from changes to groundwater quantity due to pit or quarry dewatering will be minimized; however, measurable changes to groundwater levels are still considered possible so this residual effect is carried forward for further assessment.

Based on the estimates above and the nature of dewatering large aggregate pit and quarry excavations it is likely that measurable changes to groundwater levels will occur in the radius of influence around Project aggregate pits and quarries. This residual effect would occur in an ecological context of potential reduced groundwater availability to surface water and vegetation receptors. The residual effects would be negative in direction due to reduced groundwater availability, though where the pit or quarry discharge is located may see locally increased recharge and groundwater availability. The magnitude of the residual effects would be classified as high since there is potential for groundwater levels near the excavations to see changes of more than 50 percent of the natural seasonal variability. The residual effect would be limited to the Local Study Area and would be medium-term in duration with groundwater levels expected to be reversible and recover soon after dewatering is stopped. The frequency of the residual effect would be continuous while it occurs and probable to occur where pit or quarry dewatering is carried out. As such, this Project–environment interaction is carried forward to cumulative effects.

9.3.4.3.4 Changes to Groundwater Quantity Due to Road Construction in Peatland Areas

9.3.4.3.4.1 Potential Effects

The construction of roads across peatland areas has the potential to interrupt groundwater flows through the peatland which could cause changes to the availability of groundwater to peatlands upgradient and downgradient of the Community Access Road. Changes to groundwater availability can affect the growth and health of peat and other vegetation in peatland areas.

9.3.4.3.4.2 Mitigation and Enhancement Measures

The construction of roads across peatland areas should allow for the flow of groundwater through the peat to be maintained as close to pre-construction rates as practical. This can be done by building culverts beneath the Community Access Road to permit water flow and equalize water levels across the road and constructing the roadbed with permeable materials that allow water to seep through.

To help confirm groundwater flows beneath the road, a groundwater monitoring program should be implemented to measure groundwater levels on each side of the road in areas where the road crosses peatland. This monitoring program should be maintained for several years following construction to confirm that long-term settlement and sedimentation do not significantly restrict groundwater flows over time.

9.3.4.3.4.3 Predicted Residual Effects

Based on the mitigation measures described above it is expected that the residual effects on groundwater quantity due to road construction in peatland areas will be minimized; however, measurable changes to groundwater levels are still considered possible so this residual effect is carried forward for further assessment.

Any residual effects would occur in an ecological context with changes to groundwater levels and flows potentially impacting peat and vegetation health. The residual effect would be considered a negative change since both increases and decreases in groundwater level may negatively impact peat that had previously developed in different groundwater levels. The residual effect would occur within the Construction Disturbance Area and may also extend into the Local Study Area in some cases. Implementation of mitigation measures would be expected to limit the residual effects on magnitude to medium magnitude. The residual effect would be long-term duration and it would be considered reversible where equalization culverts can be installed to restore water flow beneath the road. The residual effect would occur continuously during construction. As such, this Project–environment interaction is carried forward to cumulative effects.

9.3.4.3.5 Changes to Groundwater Quality Due to Accidental Spills and Leaks

9.3.4.3.5.1 Potential Effects

Equipment used in the construction of the Project will have the potential for malfunctions to cause leaks of fuels, oils, lubricants, coolants, and other potential contaminants. Storage and transfer of fuels and other chemicals in the effects assessment Construction Disturbance Area during construction also pose a risk of accidental spills. These accidental spills and leaks may contact the ground and migrate to the water table causing contamination of the groundwater. Both Marten Falls First Nation and Fort Albany First Nation have highlighted the potential for groundwater contamination as a result of spills / pollution as concern (Firelight Research Inc., 2004; Marten Falls First Nation, 2023).

9.3.4.3.5.2 Mitigation and Enhancement Measures

A Project-wide Spill Prevention and Emergency Response Plan should be implemented, detailing how spills and leaks will be prevented, detected, controlled, and remediated in accordance with the *Environmental Protection Act* (Government of Ontario. 1990c). All employees working with equipment at risk of spills or leaks will be trained on the Spill Prevention and Emergency Response Plan. All machinery and equipment used on the Community Access Road will be regularly inspected to maintain proper function and avoid any fluid leaks. High-risk activities such as fuelling will be done only in designated areas where secondary containment and adequate spill response supplies are available. If fuelling has to be conducted outside of designated areas, temporary secondary containment should be used, and adequate spill response supplies should be present. Fuels and other chemicals used for the Community Access Road should be stored and handled according to applicable regulations and guidelines such as the Technical Standards and Safety Act (Government of Ontario, 2000) and the *Transportation of Dangerous Goods Act* (Government of Canada, 1992).

9.3.4.3.5.3 Predicted Residual Effects

Based on the mitigation measures described above it is expected that the residual effects on groundwater quality due to accidental spills and leaks will be minimized and no residual effects are carried forward.

9.3.4.3.6 Changes to Groundwater Quality Due to Construction Waste and Wastewater Discharges

9.3.4.3.6.1 Potential Effects

Runoff from waste and wastewater from construction activities has the potential to infiltrate the ground and affect groundwater quality. Potential sources of construction waste and wastewater include equipment maintenance, concrete plants, laydown areas, and construction camps.

9.3.4.3.6.2 Mitigation and Enhancement Measures

A Waste Management Plan will be implemented for the Project to detail how Project wastes will be handled, stored, and disposed of. All staff working on the Project will be trained in and aware of the Project's Waste Management Plan. Wastes generated by Project activities will be kept in designated containment areas according to applicable legislation (for example, Ontario Regulation 347) until removed for final disposal. Any waste storage should be protected from precipitation contact that could cause contaminated runoff.

Wastewater will be treated to meet provincial water quality guidelines such as Provincial Water Quality Objectives set by the Ontario Ministry of Environment and Energy (now Environment, Conservation and Parks) (1994) and monitored to help confirm that it continues to meet the guidelines. Discharges should be permitted where required under Environmental Compliance Approvals issued by the Ontario Ministry of the Environment, Conservation and Parks.

9.3.4.3.6.3 Predicted Residual Effects

With the application of the above mitigation measures it is expected that the residual effects from changes to groundwater quality due to construction wastes and wastewater discharges will be minimized; however, measurable changes to groundwater quality are still considered possible so this residual effect is carried forward for further assessment.

Any residual effects would occur in an ecological context with changes to groundwater quality potentially impacting downgradient surface water and vegetation. The residual effect would be considered a negative change that would occur mostly within the Construction Disturbance Area but may extend into the Local Study Area in some cases. Implementation of mitigation measures would be expected to limit the residual effects on magnitude to medium. The residual effect would be medium-term duration however it would also be considered reversible once the discharge activity is stopped. Depending on the discharge, the residual effect may occur frequently or continuously

during construction and is considered probable to occur. As such, this Project–environment interaction is carried forward to cumulative effects.

9.3.4.3.7 Changes to Groundwater Quality Due to Blasting Residues

9.3.4.3.7.1 Potential Effects

Explosives used for blasting of rock during road construction or quarrying may leave residues from incomplete reactions or water contact which can be washed away and infiltrated into groundwater causing degraded groundwater quality. The typical contaminants of concern for blasting residuals are nitrogen compounds and petroleum hydrocarbons (New Hampshire Department of Environmental Services, 2019).

9.3.4.3.7.2 Mitigation and Enhancement Measures

All blasting carried out for the Project should be carried out according to applicable regulations such as the Explosives Act (Government of Canada, 1985) and the *Transportation of Dangerous Goods Act* (Government of Canada, 1992) and according to the Project's Blasting and Communication Management Plan. The Blasting and Communication Management Plan should include guidelines for explosives handling, storage, and loading to minimize the exposure of explosives to the environment and minimize explosives residue after a blast. Regular monitoring of water quality in quarry sumps and downstream of blasting areas should be conducted and compared to action levels of contaminants of concern set based on regulatory guidelines (for example, Provincial Water Quality Objectives set by the Ontario Ministry of Environment and Energy (now Environment, Conservation and Parks) (1994) and the sensitivity of downstream receptors. Post-blast inspections will also be carried out regularly to determine if there are any issues with the blast designs being used or any evidence of undetonated explosives remaining.

9.3.4.3.7.3 Predicted Residual Effects

With the application of the above mitigation measures it is expected that the residual effects from changes to groundwater quality due to blasting residues will be minimized; however, measurable changes to groundwater quality are still considered possible so this residual effect is carried forward for further assessment.

Any residual effects would occur in an ecological context with changes to groundwater quality potentially impacting downgradient surface water and vegetation. The residual effect would be considered a negative change that would occur mostly within the Construction Disturbance Area but may extend into the Local Study Area in some cases. Implementation of mitigation measures would be expected to limit the residual effects on magnitude to medium. The residual effect would be medium-term duration

however it would also be considered reversible once blasting activity is stopped. The residual effect would be expected to occur frequently during construction and is considered certain to occur based on the current construction plans. As such, this Project–environment interaction is carried forward to cumulative effects.

9.3.4.3.8 Changes to Groundwater Quality Due to Exposure of Acid-Generating or Metal Leaching Materials

9.3.4.3.8.1 Potential Effects

Some rocks and aggregate materials may generate acidic compounds when exposed to the atmosphere through breaking up of larger deposits and / or excavating deposits from below the water table. The acidic compounds released have the potential to affect water quality and infiltrate into the groundwater. Water quality effects may include reduced pH levels and increased solubility and transport of some metals. The exposure and weathering of rocks and aggregates may also result in leaching of metals; however, the initial geochemical characterization indicates that the potential for leaching of metal from non-potentially acid-generating materials is low.

9.3.4.3.8.2 Mitigation and Enhancement Measures

A monitoring program will be developed to complete further geochemical testing prior to construction in areas where road construction will expose bedrock or soils below the ground surface and where aggregate materials will be sourced from. The monitoring program should collect representative samples of bedrock and / or soils from the at-risk areas and analyze them for acid-generating potential.

If any areas of concern, such as those assessed to have moderate or high acid rock drainage potential, are identified and confirmed by the geochemical monitoring program, then excavation should be avoided at those areas, if possible. If excavation of an area of concern cannot be avoided, then a site-specific mitigation plan will be developed and implemented to contain and control the potential acid rock drainage material.

9.3.4.3.8.3 Predicted Residual Effects

Based on the mitigation measures described above it is expected that the residual effects on groundwater quality due to exposure of acid-generating or associated metal leaching materials will be minimized and no residual effects are carried forward.

9.3.4.4 Residual Effects – Operations Phase

9.3.4.4.1 Changes to Groundwater Quantity Due to Short-Term Water Takings

9.3.4.4.1.1 Potential Effects

During the Community Access Road operations phase, short-term water takings from groundwater sources may be required for the repair of below ground structures such as footings or culverts. These water takings may cause a lowering of the local groundwater levels which could reduce the groundwater quantity available for natural receptors such as vegetation and groundwater-fed waterbodies.

9.3.4.4.1.2 Mitigation and Enhancement Measures

Any water takings of greater than 50,000 litres per day will be registered with or permitted by the Ministry of the Environment, Conservation and Parks through the Environmental Activity and Sector Registry or Permit to Take Water programs. These programs will require site-specific studies and assessments of the water takings and any potential effects and mitigation measures. The Ministry of the Environment, Conservation and Parks should be consulted to establish the permits required and the preferred permitting processes to be used by the Project.

Short-term water takings for below-ground construction purposes will be designed to remove the minimum practical water volumes to allow construction to proceed safely. The water removed from the construction area will be treated as required and returned to the local watershed and allowed to infiltrate the ground to replenish most of the groundwater volumes removed for construction. Where required, this discharge will be permitted by the Ministry of the Environment, Conservation and Parks under an Environmental Compliance Approval for sewage works. Sheet piling and other methods of reducing groundwater inflow to construction excavations will be employed where practical so that pumping of groundwater is minimized. Groundwater monitoring should be conducted where permit requirements or site-specific hydrogeological studies indicate.

9.3.4.4.1.3 Predicted Residual Effects

Based on the mitigation measures described above it is expected that the residual effects on groundwater quantity due to short-term water takings will be minimized and no residual effects are carried forward.

9.3.4.4.2 Changes to Groundwater Quantity Due to Reduced or Increased Recharge

9.3.4.4.2.1 Potential Effects

Construction of the Project will result in changes to ground cover and topography. These changes could result in groundwater recharge rates being increased or decreased, which could affect local groundwater levels. Clearing of the effects assessment Construction Disturbance Area and construction of the road surface and temporary access roads, laydown areas, temporary construction camps, and pits and quarries will remove much of the vegetative cover and result in gravelled surfaces placed in much of the effects assessment Construction Disturbance Area. These gravelled surfaces may result in different infiltration rates for precipitation relative to the pre-construction conditions. In places where the Project results in lower infiltration rates and higher runoff, rates the runoff may be directed to, and collected, in areas where it is allowed to infiltrate.

Areas that were changed during construction but not maintained for use are expected to gradually return to similar to existing conditions through active or passive restoration processes. In remaining areas, these changes to groundcover will persist during road operation for the road right-of-way and any access roads, laydown areas, or pits and quarries maintained or re-activated for use during operations. This may cause locally higher or lower rates which may affect local groundwater levels. Due to the reduced area of disturbance (less than 4 percent of the Regional Study Area) persisting through the Operations Phase relative to the Construction Disturbance Area, the overall recharge rates in the Regional Study Area are expected to be within the range of seasonal variation and not measurable.

9.3.4.4.2.2 Mitigation and Enhancement Measures

Drainage of the Community Access Road and the temporary access roads, laydown areas, construction camps, and pits or quarries should allow for infiltration of the water to the local ground surface to maintain groundwater recharge rates similar to the surrounding undisturbed areas. The mitigation measures established during construction will be maintained during operations according to the Best Management Practices employed. Where treatment of runoff is required, infiltration should only be allowed after the treatment to avoid contamination of the groundwater. Rehabilitation of construction sites should seek to restore the ground cover, topography, and vegetation cover of the site to match pre-disturbance conditions as described in the Rehabilitation Plan.

9.3.4.4.2.3 Predicted Residual Effects

Based on the mitigation measures described above it is expected that the residual effects on groundwater quantity due to reduced or increased recharge will be minimized and no residual effects are carried forward.

9.3.4.4.3 Changes to Groundwater Quantity Due to Pit or Quarry Dewatering

9.3.4.4.3.1 Potential Effects

If aggregates are extracted from below the water table at pits or quarries, the local groundwater levels would be lowered either by active dewatering or dredging. Active dewatering of aggregate pits or quarries would likely take place using a sump to collect water in the bottom of the pit or quarry and pumping the water out of the sump to discharge outside the pit / quarry area. Dredging would lower groundwater levels to a lesser degree than dewatering. When aggregate material is dredged from below the water table groundwater flows into the pit to fill the volume resulting from the aggregate removal.

9.3.4.4.3.2 Mitigation and Enhancement Measures

Any aggregate pits or quarries to be maintained or developed as part of operations will be permitted under the Ontario *Aggregate Resources Act* (Government of Ontario, 1990a). As part of the permitting, site specific technical studies will be carried out, including hydrogeological studies for aggregate pits and quarries that will extract from below the water table. These permitting studies will further assess the risks of adverse effects due to the pit / quarry operation at each proposed pit / quarry site as well as establish the rehabilitation plans for each site.

Any water takings of greater than 50,000 Liter per day will require a permit through the Ministry of the Environment, Conservation and Parks through the Permit to Take Water program. The Permit to Take Water program will require site-specific studies and assessments of the water takings and any potential effects and mitigation measures to be implemented.

All water takings from Project aggregate pits and quarries should be recorded at least daily and water that is pumped out of aggregate pits and quarries should be discharged back to the local environment and allowed to infiltrate and / or run off to a waterbody capable of incorporating the discharge. This discharge will require a permit through the Ministry of the Environment, Conservation and Parks under an Environmental Compliance Approval for sewage works. The discharge should also be treated to remove sediments and monitor to help confirm no deleterious substances are discharged to the environment. Wherever possible, if the water taking from a pit / quarry

is likely to reduce water levels in an aquifer, the water discharge from the pit / quarry should be directed back to the environment in a way that allows it to recharge the affected aquifer and limits the groundwater level reductions.

Groundwater monitoring at aggregate pits and quarries that extend below the water table should be carried out in accordance with the monitoring plans and any permit requirements.

9.3.4.4.3.3 Predicted Residual Effects

With the application of the above mitigation and enhancement measures it is expected that the residual effects from changes to groundwater quantity due to pit or quarry dewatering will be minimized; however, measurable changes to groundwater levels are still considered possible so this residual effect is carried forward for further assessment.

9.3.4.4.4 Changes to Groundwater Quality Due to Accidental Spills and Leaks

9.3.4.4.4.1 Potential Effects

Equipment and vehicles used during operations of the Project will have the potential for malfunctions or accidents to cause leaks of fuels, oils, lubricants, coolants, and other potential contaminants. Storage and transfer of fuels and other chemicals in the effects assessment Construction Disturbance Area during operations also pose a risk of accidental spills. These accidental spills and leaks may contact the ground and migrate to the water table causing contamination of the groundwater.

9.3.4.4.4.2 Mitigation and Enhancement Measures

A Spill Prevention and Emergency Response Plan should be implemented for operations, detailing how spills and leaks will be prevented, detected, controlled, and cleaned up in accordance with the *Environmental Protection Act* (Government of Ontario, 1990c). All staff working with equipment at risk of spills or leaks should be trained on the spill prevention and response plan. All machinery and equipment used on the Project will be regularly inspected to maintain proper function and avoid any fluid leaks. High-risk activities such as fuelling will be done only in designated areas where secondary containment and adequate spill containment measures are available. If fuelling must be conducted outside of designated areas, temporary secondary containment will be used, and adequate spill containment supplies should be present. Fuels and other chemicals used for the Project should be stored and handled according to applicable regulations and guidelines such as the Technical Standards and Safety Act (Government of Ontario, 2000) and the *Transportation of Dangerous Goods Act* (Government of Canada, 1992).

The Community Access Road will be maintained in accordance with the Ontario Ministry of Transportation's Maintenance Manual (2003) and other provincial standards for an all-season road and the levels of traffic using it. Maintaining the road for safe, all-season use will reduce the risk of accidents and associated spills.

9.3.4.4.4.3 Predicted Residual Effects

Based on the mitigation measures described above it is expected that the residual effects on groundwater quality due to accidental spills and leaks will be minimized and no residual effects are carried forward.

9.3.4.4.5 Changes to Groundwater Quality Due to Blasting Residues

9.3.4.4.5.1 Potential Effects

Explosives used for blasting of rock during quarrying may leave residues from incomplete reactions or water contact which can be washed away and infiltrated into groundwater causing degraded groundwater quality. The typical contaminants of concern for blasting residuals are nitrogen compounds and petroleum hydrocarbons (New Hampshire Department of Environmental Services, 2019).

9.3.4.4.5.2 Mitigation and Enhancement Measures

All blasting carried out for the Community Access Road will be carried out according to applicable regulations such as the Explosives Act (Government of Canada, 1985) and the *Transportation of Dangerous Goods Act* (Government of Canada, 1992) and according to the Project's Blasting and Communication Management Plan. The Blasting and Communication Management Plan will include guidelines for explosives handling, storage, and loading in minimize the exposure of explosives to the environment and minimize explosives residue after a blast. Regular monitoring of groundwater quality in quarry sumps should be conducted and compared to action levels of contaminants of concern set based on regulatory guidelines (for example, Provincial Water Quality Objectives set by the Ontario Ministry of Environment and Energy (now Environment, Conservation and Parks) (1994) and the sensitivity of downstream receptors. Post-blast inspections will also be carried out regularly to determine if there are any issues with the blast designs being used or any evidence of undetonated explosives remaining.

9.3.4.4.5.3 Predicted Residual Effects

With the application of the above mitigation measures it is expected that the residual effects from changes to groundwater quality due to blasting residues will be minimized; however, measurable changes to groundwater quality are still considered possible so this residual effect is carried forward for further assessment.

9.3.4.4.6 Changes to Groundwater Quality Due to Exposure of Acid-Generating or Metal Leaching Materials

9.3.4.4.6.1 Potential Effects

Some rocks and aggregate materials may generate acidic compounds when exposed to the atmosphere through breaking up a larger deposits and / or excavating deposits from below the water table. The acidic compounds released have the potential to affect water quality and infiltrate into the groundwater. Water quality effects may include reduced pH levels and increased solubility and transport of some metals. The exposure and weathering of rocks and aggregates may also result in leaching of metals; however, the initial geochemical characterization indicates that the potential for leaching of metal from non-potentially acid-generating materials is low.

9.3.4.4.6.2 Mitigation and Enhancement Measures

A monitoring program will be developed to complete further geochemical testing where aggregate materials will be sourced from. The monitoring program should collect representative samples of bedrock and / or soils from the at-risk areas and analyze them for acid-generating potential.

If any areas of concern, such as those assessed to have moderate or high acid rock drainage potential are identified and confirmed by the geochemical monitoring program, then excavation should be avoided at those areas, if possible. If excavation of an area of concern cannot be avoided then a site specific mitigation plan will be developed and implemented to contain and control the potential acid rock drainage material.

9.3.4.4.6.3 Predicted Residual Effects

Based on the mitigation measures described above, it is expected that the residual effects on groundwater quality due to exposure of acid-generating or associated metal leaching materials will be minimized, and no residual effects are carried forward.

9.3.4.4.7 Changes to Groundwater Quality Due to Road Maintenance

9.3.4.4.7.1 Potential Effects

Maintenance of the Community Access Road may involve the use of chemicals such as calcium chloride and magnesium chloride for dust control. These chemicals may be washed off the road by precipitation and snowmelt and may infiltrate into the groundwater, causing changes to the groundwater quality such as increased chloride levels.

9.3.4.4.7.2 Mitigation and Enhancement Measures

Road maintenance will be carried out according to best management practices, such as those outlined by Best Practices for the Use and Storage of Chloride-Based Dust Suppressant (Environment Canada, 2007). These best practices include methods for increasing the effectiveness of the chemicals applied to the Community Access Road to reduce overall usage amounts, proper handling and storage of the chemicals to limit environmental exposure outside of use, and monitoring usage and performance to adapt to local conditions. Alternative chemicals or methods for dust control that pose lower risks of runoff and infiltration to groundwater should also be considered for implementation.

9.3.4.4.7.3 Predicted Residual Effects

With the application of the above mitigation measures it is expected that the residual effects from changes to groundwater quality due to road maintenance will be minimized; however, measurable changes to groundwater quality are still considered possible so this residual effect is carried forward for further assessment.

Any residual effects would occur in an ecological context with changes to groundwater quality potentially impacting downgradient surface water and vegetation. The residual effect would be considered negative in direction that would occur mostly within the Construction Disturbance Area but may extend into the Local Study Area in some cases. Implementation of mitigation measures would be expected to limit the residual effects on magnitude to medium. The high magnitude threshold would be reached based on the increase in measurable parameters of greater than 50 percent of existing condition values, but the applicable water quality criteria would not be expected to be exceeded. The residual effect would be long-term duration and therefore it would be considered irreversible over the Project lifespan. The residual effect would be expected to occur continuously during operations and is considered certain to occur based on the current maintenance plans. As such, this Project–environment interaction is carried forward to cumulative effects.

9.3.4.5 Summary of Residual Effects

Table 9.3-11 provides a summary of the potential effects for groundwater and geochemistry, mitigation measures, and residual effects. Detailed information is included in **Appendix H**.

Table 9.3-11: Summary of Residual Effects for Groundwater and Geochemistry and Characterization

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Groundwater**	• Temporary access roads and trails • Temporary construction camps • Pits and quarries • Temporary concrete batch plants • Drilling, blasting, and / or aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, and ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, and erosion controls)	• Construction	• Changes to groundwater quantity due to short-term water takings	• Permit or register water takings of more than 50,000 litres per day with the Ministry of the Environment, Conservation and Parks Permit to Take Water or Environmental Activity and Sector Registry programs. • Design construction dewatering to minimize the amount of groundwater that has to be extracted. • Groundwater removed from construction areas should be discharged locally and allowed to infiltrate the ground, subject to Environmental Compliance Approval by the Ministry of the Environment, Conservation and Parks. • Conduct site-specific hydrogeological studies for any groundwater sourced water supplies used for Construction. • Where possible, treated wastewater from groundwater sources should be returned to the local environment and allowed to infiltrate the ground to reduce the net taking of groundwater, subject to Environmental Compliance Approval by the Ministry of the Environment, Conservation and Parks. • Efficient water processes, fixtures and systems to be used where practical to reduce water taking requirements. • Groundwater monitoring to be conducted where required by permits or site-specific hydrogeological studies.	• No residual effect anticipated.	• No residual effect anticipated.
• **Groundwater**	• Operation, usage, and maintenance of the right-of-way and permanent access roads	• Operations	• Changes to groundwater quantity due to short-term water takings	• Permit or register water takings of more than 50,000 litres per day with the Ministry of the Environment, Conservation and Parks Permit to Take Water or Environmental Activity and Sector Registry programs. • Design construction dewatering to minimize the amount of groundwater that has to be extracted. • Where possible, treated wastewater from groundwater sources should be returned to the local environment and allowed to infiltrate the ground to reduce the net taking of groundwater, subject to Environmental Compliance Approval by the Ministry of the Environment, Conservation and Parks. • Efficient water processes, fixtures and systems to be used where practical to reduce water taking requirements. • Groundwater monitoring to be conducted where required by permits or site-specific hydrogeological studies.	• No residual effect anticipated.	• No residual effect anticipated.

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Groundwater**	• Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Pits and quarries • Temporary concrete batch plants • Drilling, blasting, and / or aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, and ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, and erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the Ontario *Aggregate Resources Act*. • Decommissioning of temporary camps, roads, trails, and staging areas	• Construction	• Changes to groundwater quantity due to reduced or increased recharge	• Design Project drainage to allow for local infiltration of water. • Follow drainage best management practices such as those outlined in the Environmental Guide for Erosion and Sediment Control During Construction of Highway Projects (Ministry of Transportation, 2015) and Environmental Guidelines for Access Roads and Water Crossings (Ministry of Natural Resources, 2019). • Avoid infiltration of contaminated water or infiltration of water at locations that could be negatively impacted by raised groundwater levels. • Restore temporary construction infrastructure construction and sites to match pre-disturbance ground cover, topography, and vegetation conditions.	• No residual effect anticipated.	• No residual effect anticipated.
• **Groundwater**	• Operation, usage, and maintenance of the right-of-way and permanent access roads	• Operations	• Changes to groundwater quantity due to reduced or increased recharge	• Design Project drainage to allow for local infiltration of water. • Follow drainage best management practices such as those outlined in the Environmental Guide for Erosion and Sediment Control During Construction of Highway Projects (Ministry of Transportation, 2015) and Environmental Guidelines for Access Roads and Water Crossings (Ministry of Natural Resources, 2019). • Avoid infiltration of contaminated water or infiltration of water at locations that could be negatively impacted by raised groundwater levels. • Restore temporary construction infrastructure and sites to match pre-disturbance ground cover, topography, and vegetation conditions.	• No residual effect anticipated.	• No residual effect anticipated.

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Groundwater**	• Pits and quarries • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the Ontario *Aggregate Resources Act*.	• Construction	• Changes to groundwater quantity due to pit or quarry dewatering	• All aggregate pits and quarries will be permitted by the Ministry of Natural Resources under the *Aggregate Resources Act* (Government of Ontario, 1990b) including technical studies to assess any extraction proposed below the water table. • Any aggregate pit or quarry dewatering in excess of 50,000 litres per day will be permitted by a Permit to Take Water from the Ministry of the Environment, Conservation and Parks. A technical water taking assessment of potential effects and mitigation measures will be required for the permit application. • Industry best management practices for water taking from pits and quarries should be employed such as recording water takings volumes and times, discharging water back to the environment in a way that allows for replenishment of groundwater, onsite water re-use, and monitoring of discharge water quality. Discharge of water will be subject to Environmental Compliance Approval by the Ministry of the Environment, Conservation and Parks. • Groundwater monitoring programs to be established in accordance with permit requirements and Project monitoring plans.	• Large volumes of groundwater taking typically associated with dewatering of aggregate pits and quarries may still result in measurable changes to groundwater levels.	• Context: Ecological • Direction: Negative • Magnitude: High • Geographic Extent: Local Study Area • Duration: Medium term • Frequency: Continuous • Reversibility: Reversible • Likelihood: Probably • Significance: Not Significant • Uncertainty: Moderate • Direct / Indirect: Direct
• **Groundwater**	• Pits and quarries • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the Ontario *Aggregate Resources Act*.	• Operations	• Changes to groundwater quantity due to pit or quarry dewatering	• All aggregate pits and quarries will be permitted by the Ministry of Natural Resources under the *Aggregate Resources Act* (Government of Ontario, 1990b) including technical studies to assess any extraction proposed below the water table. • Any aggregate pit or quarry dewatering in excess of 50,000 litres per day will be permitted by a Permit to Take Water from the Ministry of the Environment, Conservation and Parks. A technical water taking assessment of potential effects and mitigation measures will be required for the permit application. • Industry best management practices for water taking from pits and quarries should be employed such as recording water takings volumes and times, discharging water back to the environment in a way that allows for replenishment of groundwater, onsite water re-use, and monitoring of discharge water quality. Discharge of water will be subject to Environmental Compliance Approval by the Ministry of the Environment, Conservation and Parks. • Groundwater monitoring programs to be established in accordance with permit requirements and Project monitoring plans.	• Large volumes of groundwater taking typically associated with dewatering of aggregate pits and quarries may still result in measurable changes to groundwater levels.	• Context: Ecological • Direction: Negative • Magnitude: High • Geographic Extent: Local Study Area • Duration: Medium term • Frequency: Continuous • Reversibility: Reversible • Likelihood: Probably • Significance: Not Significant • Uncertainty: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Groundwater**	• Temporary access roads and trails • Road construction (stripping, subgrade excavation, embankment fill placement, grading, and ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, and erosion controls) • Decommissioning of temporary camps, roads, trails, and staging areas	• Construction	• Changes to groundwater quantity due to road construction in peatland areas	• The Community Access Road foundation design and construction should allow for groundwater flow through the peat to be maintained near to natural rates. • Road design should include equalization culverts and permeable base materials in peat land areas. • A groundwater monitoring program should be implemented in areas where the road is constructed on top of peatlands to identify if groundwater flow beneath the road is significantly restricted.	• Settlement and sedimentation of road base materials and compression of the underlying peat may cause restrictions to groundwater flows over time.	• Context: Ecological • Direction: Negative • Magnitude: Medium • Geographic Extent: Local Study Area • Duration: Long term • Frequency: Continuous • Reversibility: Reversible • Likelihood: Possible • Significance: Not Significant • Uncertainty: Moderate • Direct / Indirect: Indirect
• **Groundwater**	• Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Pits and quarries • Temporary concrete batch plants • Drilling, blasting, and / or aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, and ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, and erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the Ontario *Aggregate Resources Act*. • Decommissioning of temporary camps, roads, trails, and staging areas	• Construction	• Changes to groundwater quality due to accidental spills and leaks	• A Spill Prevention and Emergency Response Plan should be developed and implemented for the Project. • Project staff will be trained on the Spill Prevention and Emergency Response Plan. • Machinery and equipment will be regularly inspected and have appropriate spill containment supplies available at all worksites. • Fuelling should be limited to designated areas where secondary containment and adequate spill containment measures are available. • Fuels and hazardous materials should be stored and handled in accordance with applicable regulations and best management practices such as the Technical Standards and Safety Act (Government of Ontario, 2000) and the *Transportation of Dangerous Goods Act* (Government of Canada, 1992).	• No residual effect anticipated	• No residual effect anticipated

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Groundwater**	• Operation, usage, and maintenance of the right-of-way and permanent access roads	• Operations	• Changes to groundwater quality due to accidental spills and leaks	• A Spill Prevention and Emergency Response Plan should be developed and implemented for Operations. • Project staff will be trained on the Spill Prevention and Emergency Response Plan. • Machinery and equipment will be regularly inspected and have appropriate spill containment supplies available at all worksites. • Fuelling should be limited to designated areas where secondary containment and adequate spill containment measures are available. • Fuels and hazardous materials should be stored and handled in accordance with applicable regulations and best management practices such as the Technical Standards and Safety Act (Government of Ontario, 2000) and the *Transportation of Dangerous Goods Act* (Government of Canada, 1992). • The Community Access Road will be maintained in accordance with provincial standards to reduce the risk of accidents and associated spills.	• No residual effect anticipated	• No residual effect anticipated
• **Groundwater**	• Temporary construction staging areas • Temporary construction camps • Pits and quarries • Temporary concrete batch plants • Drilling, blasting, and / or aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, and ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, and erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the Ontario *Aggregate Resources Act*. • Decommissioning of temporary camps, roads, trails, and staging areas	• Construction	• Changes to groundwater quality due to construction wastes and wastewater discharges	• A Waste Management Plan will be developed for the Project and include details for how wastes should be stored, handled, and disposed of. • All Project staff will be trained in the Waste Management Plan. • Project waste should be stored in designated containment areas in accordance with applicable legislation (for example, Ontario Regulation 347; Government of Ontario, 1990c) until removed for final disposal. • Any wastewater generated by the Project should be disposed of at a licensed disposal site or treated to meet water quality guidelines such as the Provincial Water Quality Objectives (Ministry of the Environment, Conservation and Parks, 1994) before release. • Any releases of wastewater should be permitted by an Environmental Compliance Approval from the Ministry of the Environment, Conservation and Parks.	• Release of treated wastewater may still result in measurable changes to groundwater quality	• Context: Ecological • Direction: Negative • Magnitude: Medium • Geographic Extent: Local Study Area • Duration: Medium term • Frequency: Continuous • Reversibility: Reversible • Likelihood: Probable • Significance: Not Significant • Uncertainty: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Groundwater**	• Temporary access roads and trails • Pits and quarries • Drilling, blasting, and / or aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, and ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, and erosion controls) • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the Ontario *Aggregate Resources Act*.	• Construction	• Changes to groundwater quality due to blasting residues	• Project blasting should be carried out in accordance with applicable regulations such as the Explosives Act (Government of Canada, 1985) and the *Transportation of Dangerous Goods Act* (Government of Canada, 1992). • A Blasting and Communication Management Plan will be developed for the Project and include guidelines for explosives handling, storage, and loading to minimize explosives exposure to the environment and minimize explosives residue after blasting. • Regular monitoring of water quality in quarry sumps and downstream of blasting areas should be conducted and compared to action levels of contaminants of concern set based on regulatory guidelines. • Post-blast inspections will be regularly carried out to identify issues with blast design and detonations.	• Use of blasting explosives may still result in measurable changes to groundwater quality.	• Context: Ecological • Direction: Negative • Magnitude: Medium • Geographic Extent: Local Study Area • Duration: Medium term • Frequency: Frequent • Reversibility: Reversible • Likelihood: Certain • Significance: Not Significant • Uncertainty: Moderate • Direct / Indirect: Direct
• **Groundwater**	• Pits and quarries • Drilling, blasting, and / or aggregate production • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the Ontario *Aggregate Resources Act*.	• Operations	• Changes to groundwater quality due to blasting residues	• Project blasting should be carried out according to applicable regulations such as the Explosives Act (Government of Canada, 1985) and the *Transportation of Dangerous Goods Act* (Government of Canada, 1992). • A Blasting and Communication Management Plan will be developed for the Project and include guidelines for explosives handling, storage, and loading to minimize explosives exposure to the environment and minimize explosives residue after blasting. • Regular monitoring of water quality in quarry sumps should be conducted and compared to action levels of contaminants of concern set based on regulatory guidelines. • Post-blast inspections will be regularly carried out to identify issues with blast design and detonations.	• Use of blasting explosives may still result in measurable changes to groundwater quality. • Context: Ecological	• Direction: Negative • Magnitude: Medium • Geographic Extent: Local Study Area • Duration: Medium term • Frequency: Frequent • Reversibility: Reversible • Likelihood: Certain • Significance: Not Significant • Uncertainty: Moderate • Direct / Indirect: Direct
• **Groundwater**	• Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Pits and quarries • Drilling, blasting, and / or aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, and ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, and erosion controls) • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the Ontario *Aggregate Resources Act*.	• Construction	• Changes to groundwater quality due to exposure of acid-generating or metal leaching materials	• A geochemical monitoring program will be developed to test bedrock and soils in areas where they will be exposed by excavation. • Any materials identified as at risk for acid generation or metal leaching should not be excavated.	• No residual effect anticipated	• No residual effect anticipated

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Groundwater**	• Pits and quarries • Drilling, blasting, and / or aggregate production • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the Ontario *Aggregate Resources Act*	• Operations	• Changes to groundwater quality due to exposure of acid-generating or metal leaching materials	• A geochemical monitoring program will be developed to test bedrock and soils in areas where they will be exposed by excavation. • Any materials identified as at risk for acid generation or metal leaching will not be excavated or will be subject to site-specific mitigation and management plans to contain and control potential acid rock drainage if excavation is unavoidable.	• No residual effect anticipated	• No residual effect anticipated
• **Groundwater**	• Operation, usage, and maintenance of the right-of-way and permanent access roads	• Operations	• Changes to groundwater quality due to road maintenance	• Road maintenance should be carried out in accordance with best management practices such as those outlined in the Best Practices for the Use and Storage of Chloride-Based Dust Suppressant (Environment Canada, 2007) to reduce the use of chemicals for dust control and minimize runoff of chemicals to the environment. • Alternative chemicals or methods of dust control that pose less risk of runoff and infiltration should be considered for use.	• Some residual effects may be possible even after application of the mitigation measures. The use of chemicals for road maintenance may still result in measurable changes to groundwater quality.	• Context: Ecological • Direction: Negative • Magnitude: Medium • Geographic Extent: Local Study Area • Duration: Long term • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Certain • Significance: Not Significant • Uncertainty: Moderate • Direct / Indirect: Direct

Footnotes:
- Temporary construction staging areas, access roads, construction camps, and pits and quarries activities include construction and use of this equipment or infrastructure.
- Maintenance of the route includes general maintenance activities (for example, grading, erosion control, quarrying, and pits and quarries), seasonal maintenance activities (for example, snow clearing and bridge and culvert maintenance), and special maintenance activities (for example, slope failures and road settlement / break-up).

9.3.5 Peatlands

9.3.5.1 Project-Environment Interactions

As a component of the effects assessment, the Project activities were reviewed to find potential environmental interactions. These interactions were then assessed for potential effect (**Table 9.3-12**).

Table 9.3-12: Project-Environment Interactions - Peatlands

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• **Construction**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Brush and timber disposal • Pits and quarries • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas	• Peatland Ecosystems	• Habitat quantity and quality • Availability • Distribution	• Changes to the availability and distribution of peatland ecosystems as a result of direct peatland loss
• **Construction**	• Same as above	• Peatland Ecosystems	• Composition and Function	• Changes to the composition and function of peatland ecosystems as a result of direct peatland loss • Changes to peatland ecosystems as a result of changes to hydrology (such as, alteration of drainage patterns and increased / decreased drainage flows and surface levels that can cause changes to soils and vegetation health and composition, thereby changing the availability, distribution, composition, and function of retained peatland communities) • Changes to peatland ecosystems as a result of changes to groundwater (such as, alteration of drainage patterns and increased / decreased drainage flows and groundwater levels that can cause changes to soils and vegetation health and composition, thereby changing the availability, distribution, composition, and function of retained peatland communities) • Changes to peatland ecosystems resulting from the introduction and spread of invasive plant species (for example, Phragmites) • Changes to peatland ecosystems as a result of fragmentation and edge effects (such as, clearing within an otherwise intact landscape that introduces a range of edge effects on retained peatland communities including sunscald and windthrow) • Changes to peatland ecosystems from the release of sediment during construction • Changes to peatland ecosystems from spills of fuel or other contaminants • Changes to peatland ecosystems as a result of the deposition of air contaminants • Changes to peatland ecosystems as a result of fugitive dust emissions • Changes to peatland ecosystems as a result of increased public access
• **Construction**	• Same as above	• Peatland Ecosystems	• Carbon Storage and Flux	• Changes to peatland ecosystem carbon storage and flux

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• **Operations**	• Road usage • Maintenance	• Peatland Ecosystems	• Availability • Distribution	• Changes to the availability and distribution of peatland ecosystems as a result of additional peatland loss for maintenance activities
			• Composition and Function	• Changes to peatland ecosystems resulting from the introduction and spread of invasive plant species
				• Changes to peatland ecosystems as a result of fragmentation and edge effects (such as, clearing within an otherwise intact landscape that introduces a range of edge effects on retained peatland communities including sunscald and windthrow)
				• Changes to peatland ecosystems from spills of fuel or other contaminants
				• Changes to peatland ecosystems as a result of the deposition of air contaminants
				• Changes to peatland ecosystems as a result of fugitive dust emissions
				• Changes to peatland ecosystems as a result of increased public access
			• Carbon Storage and Flux	• Changes to peatland ecosystem carbon storage and flux

9.3.5.2 Discipline-Specific Characteristics

In support of the residual effects characteristics described in **Section 6.7.3**, **Table 6-1**, the following peatlands definitions apply to the effects assessment.

Ecological and Social Context

Context for peatland ecosystems considers sensitivity, resilience, and adaptive capacity, applicable legislation and best management practices. The current and future sensitivity and resilience of peatland ecosystems to change caused by the Project are considered and includes Indigenous Knowledge, where available. Consideration of ecological context includes timing, such as when the effect could occur. Context also informs whether the residual effect would alter the ability of the peatland ecosystems to be self-sustaining (in other words, the determination of significance). Ecological context is discussed in a reasoned narrative with other characteristics such as magnitude, geographic extent, duration, reversibility, and probability of occurrence used to characterize residual effects and determine significance.

Magnitude

When evaluating the magnitude of effects, the peatland assessment considered both the proportion of the valued component affected within identified spatial boundaries and the relative effect.

For magnitude, environmental discipline-specific definitions are required and are provided in (**Table 9.3-13**).

Table 9.3-13: Peatland Magnitude Definition

Magnitude Level	Definition	Rationale
• **Negligible**	• Limited to no variation predicted in the measurement indicators for peatland ecosystems	• Changes to peatland ecosystems are minor and largely indiscernible; therefore, no effect on ecosystem resilience
• **Low**	• A small variation predicted in the measurement indicators for peatland ecosystems	• Minor incremental effects on peatland ecosystems are anticipated to be discernible but remain within the limits of ecosystem resilience
• **Medium**	• A moderate variation predicted in the measurement indicators for peatland ecosystems	• Incremental effects on peatland ecosystems are anticipated to be measurable but is inferred to remain within the limits of ecosystem resilience
• **High**	• A large variation predicted in the measurement indicators for peatland ecosystems	• Effects on peatland ecosystems are anticipated to be severe and likely to impair ecosystem resilience

9.3.5.3 Residual Effects - Construction Phase

9.3.5.3.1 Changes to the Availability and Distribution of Peatland Ecosystems as a Result of Direct Peatland Loss

9.3.5.3.1.1 Potential Effects

Clearing of, and / or building on top of, peatlands during construction will result in the direct loss of peatland ecosystems (bog, fen, marsh, and swamp), thereby reducing the availability of these communities within the effects assessment Local and Regional Study Areas as well as changing their distribution within the Project landscape. It is conservatively assumed that the entire effects assessment Construction Disturbance Area will be cleared, resulting in the following direct loss of peatland ecosystems:

- 2,150.6 hectares of peatland ecosystems, which equates to 3 percent of the peatland ecosystems within the effects assessment Local Study Area and <1 percent of peatlands within the effects assessment Regional Study Area. This is composed of the following peatland types:
- 1,308.8 hectares of organic swamp (in other words, 1 percent of the organic swamp within the effects assessment Local Study Area and <1 percent of the effects assessment Regional Study Area).
- 26.4 hectares of organic marsh (in other words, <1 percent of the marsh within the effects assessment Local Study Area and <1 percent of the effects assessment Regional Study Area).
- 786.2 hectares of Fen (in other words, <1 percent of the Fen within the effects assessment Local Study Area and <1 percent of the effects assessment Regional Study Area).
- 29.2 hectares of Bog (in other words, <1 percent of the Bog within the effects assessment Local Study Area and <1 percent of the effects assessment Regional Study Area).

Most of these direct losses are expected to be permanent (and are assumed to be permanent in the direct loss calculation) because the Operations Phase is expected to be indefinite. However, the effects assessment Construction Disturbance Area footprint includes temporary features (for example, temporary access roads, storage and temporary laydown areas, temporary construction camps, and temporary pits and quarries) some of which may be decommissioned and restored or vegetation will be established, as outlined on the required Rehabilitation Plan to align with the ‘Aggregate Resources of Ontario: Site Plan (2020) Standards’. These areas are anticipated to eventually provide some of the functions that cleared peatland communities currently

provide, but the reestablishment of certain peatland community types (especially fens and bogs) is particularly challenging without some form of human intervention. It has been demonstrated that peat moss does not re-establish well on its own in areas where peat has been removed or harvested and the existing peat moss species have been stripped (Ferland and Rochefort, 1997). Instead, sites tend to be colonized by vascular plant species that do not provide or establish the same ecological functions (Ferland and Rochefort, 1997). Some active restoration of temporary disturbances is anticipated to be carried out. Restoration approaches will be developed as part of the Vegetation Restoration Plan to be prepared during detail design.

9.3.5.3.1.2 Mitigation and Enhancement Measures

Mitigation measures that will be implemented during construction to minimize direct loss of peatland ecosystems wherever and whenever possible include the following:

- Limit vegetation clearing to within the 100-metre right-of-way and to less than this width to the extent possible;
  - Minimize clearing widths in peatland ecosystems to the extent feasible, given the difficulty of effective restoration of these ecosystems.
  - Adjust the alignment or clear off centre within the right-of-way where warranted, to minimize effects on peatland ecosystems. These details will be refined during detail design, prior to construction.
  - Limit clearing of riparian vegetation (in other words, within 30 metre of waterbodies) to the extent possible and to the requirements of the access road and alignment clearing width only.
  - Locate temporary access roads, staging areas, camps, and debris and / or timber stockpiles in less sensitive ecosystems (for example, upland ecosystems), where feasible. Avoid peatland communities for temporary features wherever feasible.
- Upon completion of construction, sand and gravel pits, including temporary access roads leading to the pits will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the Aggregate Resource Act, which will include backfilling, levelling, recompacting, and redistributing organic materials. Temporary access roads leading to temporary quarry areas will also be decommissioned. Temporary quarries not required for maintenance activities will be vegetated in accordance with the Rehabilitation Plan. Quarries maintained for operations will be blocked to discourage public use but facilitate access for ongoing road maintenance. The number of quarries required for maintenance are unknown at this time;

- Perform clearing and construction activities in winter months where feasible, to minimize compaction of peat. A review of the project construction schedule will be completed during detail design to coordinate work based on environmental timing windows and timing restrictions;
- Develop and implement a Project-specific Environmental Protection Plan;
- Have Environmental Monitors and Indigenous Environmental Monitors onsite during construction to confirm that all mitigation measures are being implemented appropriately. Details regarding Environmental Monitors and their role during the project will be determined through the development of the Environmental Protection Plan;
- Prepare and implement a Rehabilitation Plan that includes measures specific to peatland ecosystems and peatland restoration, including peat stockpile management. This plan will be developed through engagement and consultation with Indigenous communities and integration of local Indigenous Knowledge and stewardship protocols; and
- Given the difficulty of restoring peatland environments and the overall size of the Construction Disturbance Area, if it's determined that restoration of all temporarily impacted peatland communities is not feasible, additional examination of the Construction Disturbance Area may be required to determine where peatland restoration efforts are required. Restoration techniques for peatland communities should follow established practices that have previously been shown to be successful in the establishment of appropriate ecological conditions including plant assemblages (for example, the reestablishment of peat moss layers) and hydrology. Consideration should also be given to the type of community being restored. For example, the Moss Layer Transfer Technique is one method generally used for the reestablishment of bog and poor fen systems (Quinty et al., 2019). However, new methods or adjustments to existing techniques may be required for other peatland community types given the differences in species presence and hydrological conditions (for example, best practices for bog restoration may not be applicable to fen community types) (Quinty et al., 2019).

9.3.5.3.1.3 Predicted Residual Effects

Measures to minimize direct effects on peatland ecosystems will be implemented, but direct losses cannot be avoided. Therefore, changes as a result of direct vegetation loss during construction are predicted to result in residual effects on the availability and distribution of peatlands and this interaction is carried forward to the residual effects characterization.

After implementation of the mitigation measures, the effects of direct peatland ecosystem loss on the availability and distribution of peatland ecosystems will be permanent (irreversible) and long term in duration. The effects are certain to occur, and the changes are negative; however, because the loss will be relatively small in extent, the magnitude is considered low. As a result, the residual effects of direct peatland loss on the availability and distribution of peatland ecosystems are determined to be not significant. As such, this Project–environment interaction is carried forward to cumulative effects.

9.3.5.3.2 Changes to the Composition and Function of Peatland Ecosystems as a Result of Direct Peatland Loss

9.3.5.3.2.1 Potential Effects

Clearing of peatlands during construction and the placement of a permanent “floating road” over these areas will result in the direct loss of peatland ecosystems, thereby altering the composition and functions of these ecosystems in the effects assessment Local and Regional Study Areas.

Removal of peatland vegetation will reduce habitat availability (in other words, through direct loss of habitat) and can alter habitat suitability (for example, by disrupting habitat and / or hydrological connectivity) for wildlife and vegetation species. This can result in a decline in biodiversity. More detailed discussions of potential effects on wildlife habitat are in the Wildlife Technical Support Document (**Appendix K**), Birds Technical Support Document (**Appendix L**) and Ungulates Technical Support Document (**Appendix M**). Indigenous communities including Fort Albany First Nation also highlighted concerns related to potential impacts on and loss of peatland habitats. In particular, how the loss of air filtering capacity due to peatland loss might result in changes to the diet of wildlife species, particularly for small mammals and rodents (Fort Albany First Nation, 2024).

In addition to the above, removal of peatlands in riparian systems can reduce the stabilizing forces provided by plant roots, reduce physical obstructions provided by plant material that moderate surface water run-off velocity, and expose vulnerable banks or slopes resulting in increased erosion and sedimentation. Disturbance of soils can contribute to sedimentation by increasing the quantity of loose material present. Soil disturbance during vegetation removal can also facilitate the spread of invasive species. Loss of riparian vegetation cover may increase the water temperature due to a reduction in shading, which can reduce aquatic species richness and alter habitat suitability for fish. A more detailed discussion of potential effects on fish and fish habitat are discussed in the Fish and Fish Habitat Technical Support Document (**Appendix G**).

Direct loss of peatlands will also result in the direct loss of functional peatland area and might reduce the ability of remaining areas to carry out important ecosystem functions. For example, construction on areas that were previously swamp or fen might reduce surface water flows into unaffected areas, causing the water table to drop and conditions to become unsuitable for species adapted to saturated soils. This, in turn, could result in an increased abundance of upland species, a reduction in biodiversity, a decline in peat production and an accompanying reduction in carbon sequestration capacity (Borkenhagen et al., 2023). Fort Albany First Nation has also highlighted concerns specific to how potential changes in the composition of peatland ecosystems, such as the reduction of low-growing mosses and wetland plants and replacement with larger shrubs and vegetation which thrive in drier conditions (Fort Albany First Nation, 2024). Peatland loss also reduces the capacity of ecosystems to conduct biogeochemical functions such as photosynthesis and the uptake and processing of nutrients.

9.3.5.3.2.2 Mitigation and Enhancement Measures

Mitigation measures that will be implemented during construction to minimize direct loss of peatlands wherever and whenever possible are outlined in **Table 9.3-15**.

9.3.5.3.2.3 Predicted Residual Effects

Measures to minimize direct effects on peatland ecosystems will be implemented, but direct losses cannot be avoided. Therefore, direct peatland loss during construction is predicted to result in a residual effect on the composition and function of peatland ecosystems are and this interaction is carried forward to the residual effects characterization.

After implementation of the mitigation measures, the effects of direct peatland ecosystem loss on the composition and function of peatland ecosystems will be permanent (irreversible), and therefore long term. The effects are certain to occur, and the changes are negative; however as noted above, the magnitude is considered low as the area lost will be small relative to that which is existing. Accordingly, the residual effects of direct peatland loss on the composition and function of peatland ecosystems are determined to be not significant. As such, this Project–environment interaction is carried forward to cumulative effects.

9.3.5.3.3 Changes to Peatland Ecosystems as a Result of Changes to Hydrology

9.3.5.3.3.1 Potential Effects

Project activities such as road construction through peatlands, watercourse crossings, vegetation clearing, short-term water-taking and discharge of water during construction can cause alterations of drainage patterns, impacts on surface water quality, and increased / decreased drainage flows and surface water levels. This can, in turn, cause changes to soils and vegetation health / composition, thereby altering the availability, distribution, composition and function of retained peatland ecosystems. Although peatland ecosystems experience water level fluctuations as part of natural variability, changes in the amplitude, frequency, and timing of flood or drought compared to historical levels can cause adverse effects. Permanent changes to local hydrology can influence whether a peatland continues to act as a carbon sink with drier conditions allowing for increased decomposition rates while increased water levels can lead to an increase in the release of methane (Zhang et al., 2022). Permanent changes to hydrology can also exacerbate anticipated impacts on peatlands expected on a broader scale from climate change, including increased levels of local evapotranspiration from drier overall conditions (Price et al., 2023).

Changes to surface water drainage can lead to increased levels of surface water runoff into adjacent peatland communities, which can have an impact on the species composition of a community and the overall community classification. For example, flooding can cause a turnover of vegetation, leading to the die-off of woody vegetation, creating more open peatland habitats such as open bogs, open fens and marsh habitat that replace treed peatland habitats (Asada et al., 2005). Additionally, linear disturbances obstructing surface flow between an upgradient and downgradient side of the Community Access Road can lead to increased water levels and pooling on the upgradient side, causing aerobic conditions and the accelerated decomposition of peat on the downgradient end, further influencing the composition and function of these peatland communities (Vu, 2019). Similarly, studies have found that in some instances, a drawdown of water tables can create a disconnect between previously connected peatland systems and can, in-turn, impact water availability for downstream systems (Balliston et al., 2023).

Studies have also demonstrated that impacts on local hydrology from access roads in combination with impacts on the surrounding vegetation from road construction can lead to localized increases in carbon and methane emissions as well as increased enzyme activities, which might lead to higher decomposition rates of organic matter (Saraswati and Strack, 2019; Saraswati et al., 2019; Saraswati et al., 2023). If changes to

hydrology are notable enough to change the composition of a peatland community, the availability, distribution, composition, and function of that altered peatland community type will also eventually be affected within the effects assessment Local Study Area.

Fort Albany First Nation has noted concerns related to peatlands drying (and increased potential for fire hazards) and impacts on peatland hydrology and landscape stability (Fort Albany First Nation, 2020). Kashechewan First Nation has similar noted concerns related to the drying of peatlands due to lower water levels in rivers within their traditional territory resulting from historical damming and diversion activities upriver of their community (Kashechewan First Nation, 2024). Fort Albany First Nation also has concerns about potential impacts and interactions relating to peatland disturbance and permafrost degradation (Fort Albany First Nation, 2020). Properly functioning peatland systems are capable of mitigating impacts of wildfires through their elevated water levels and permanently saturated conditions (Price et al., 2023). However, a peatland can lose its ability to mitigate against wildfire activity when the water table has decreased and the upper layer of peat dries (Natural Resources Canada, 2024). Wildfires within boreal peatlands can release substantial amounts of carbon, methane and other greenhouse gases to the atmosphere including elements such as mercury, which can have health impacts for surrounding communities (Lin et al., 2021; Natural Resources Canada, 2024).

The surface water quality within peatlands may also be affected by the construction of the Community Access Road. During construction, surface water may become contaminated if chemicals or substances (for example, petroleum products, sediments, and garbage) from Project equipment, vehicles, road surfaces, or blasting sites are transported into surface water during precipitation events (**Appendix F**). This includes contamination of surface water from accidental spills and leaks of chemicals and hazardous materials.

Additionally, there may be changes to surface water quality from increases in concentrations of suspended solids in waterbodies as a result of increased rates of erosion–sedimentation processes during water-taking and discharge activities. This might also occur following the removal of the diversion works and / or installation or removal of temporary waterbody crossing structures due to the disturbance of the bed and banks of a waterbody (Surface Water Technical Support Document; **Appendix F**).

Furthermore, air emissions from Project activities during construction could result in changes to surface water quality (Surface Water Technical Support Document; **Appendix F**).

Areas in the Construction Disturbance Area are at highest risk of surface water contamination from the Project (Surface Water Technical Support Document; **Appendix F**).

Short-term residual changes to surface water quantity are predicted during construction because of short-term water discharges and water-taking and water diversions at waterbody crossings (Surface Water Technical Support Document; **Appendix F**). These residual effects have been assessed as likely to cause minimal changes to stream flows and / or water levels at receiving waterbodies and be limited to, at most, the spatial extent of the Local Study Area during construction (Surface Water Technical Support Document; **Appendix F**). This finding has been extrapolated to indicate that the resulting residual effects on peatland ecosystems is likewise expected to be minimal and limited to the Local Study Area during construction.

9.3.5.3.3.2 Mitigation and Enhancement Measures

A list of mitigation measures to limit changes to surface water quantity and quality during construction is provided in the Surface Water Technical Support Document (**Appendix F**).

Additional mitigation measures that will be implemented during construction, specific to peatlands include:

- During detail design, carefully consider placement of culverts in peatland environments with a particular emphasis on the installation of culverts in areas where the road runs perpendicular to the natural flow of surface water;
- Have Environmental Monitors and Indigenous Environmental Monitors onsite during construction to confirm that all mitigation measures are being implemented appropriately. Details regarding Environmental Monitors and their role during the project will be determined through the development of the Environmental Protection Plan;
- Design and implement a pre-, during- and post-construction monitoring program that assesses surface water movement and helps maintain pre-construction conditions to the extent feasible; and
- Implement adaptive management measures if drainage patterns are determined to be significantly altered. Adaptive management measures will be determined through the development of the Environmental Protection Plan.

Once further hydrological monitoring and water budget studies are undertaken at detail design, specific mitigation measures to maintain peatland hydrology may be required and will be included with detail design documentation as the Project schedule allows.

9.3.5.3.3.3 Predicted Residual Effects

With the implementation of the recommended mitigation measures, changes to hydrology will be minimized and impacts to retained peatland ecosystems should be minimal. However, this assumes that the mitigation measures will be sufficient to maintain pre-construction drainage patterns. It is expected that a robust monitoring program will be undertaken, and adaptive management measures implemented, as required. Changes to peatland ecosystems as a result of changes to hydrology is predicted to result in a residual effect and this interaction is carried forward to the residual effects characterization

Changes to peatland ecosystems resulting from changes in hydrology that may alter drainage patterns and increase or decrease drainage flows and surface water levels are expected to be negative in direction, negligible in magnitude, local in geographic extent, long term, infrequent, irreversible, and possible. As a result, the residual effects as a result of changes to hydrology on peatland ecosystems are determined to be not significant. As such, this Project–environment interaction was not carried forward to cumulative effects.

9.3.5.3.4 Changes to Peatland Ecosystems as a Result of Changes to Groundwater

9.3.5.3.4.1 Potential Effects

As discussed in the Groundwater Technical Support Document (**Appendix H**), during construction, short-term water-takings from groundwater sources may be required for the installation of below ground structures, such as footings or culverts, or for water supply to temporary construction camps or temporary concrete batch plants. These water takings may cause a lowering of the local groundwater levels. If aggregates are extracted from below the water table at pits or quarries, the local groundwater levels will be lowered either by active dewatering or dredging. Additionally, clearing of the effects assessment Construction Disturbance Area will remove much of the vegetative cover, and this will be replaced with gravelled surfaces. These gravelled surfaces are expected to have different infiltration rates from precipitation than the existing conditions.

Changes to groundwater recharge rates and local groundwater levels could reduce the groundwater quantity available for natural receptors such as vegetation and groundwater-fed waterbodies. Similarly, the construction of roads across peatland areas

has the potential to interrupt groundwater flows through the peatland, which could cause changes to the availability of groundwater to peatlands upgradient and downgradient of the Community Access Road.

Groundwater quality may be affected through changing groundwater levels which could have an impact on various peatland processes, a change in the groundwater chemistry in areas adjacent to the road, or through spills during construction. For example, the drying of peat, where the groundwater regime has been altered by construction and operation of the road, or impacted via climate change, could lead to an increase in production of methylmercury and inorganic mercury concentrations in peatland communities.

Other potential sources of groundwater contaminants may include the application of chemicals for dust-control and de-icing during both the construction and operation stages, which could enter peatland ecosystems through surface water runoff.

If changes to groundwater regimes are notable enough to change the composition of a peatland community, the availability, distribution, composition, and function of that altered peatland community type could eventually be affected within the effects assessment Local Study Area.

9.3.5.3.4.2 Mitigation and Enhancement Measures

A comprehensive list of mitigation measures to limit changes to groundwater quantity and quality during construction is provided in the Groundwater Technical Support Document (**Appendix H).** The effectiveness of mitigation measures will be evaluated during construction and mitigation measures will be modified or enhanced as necessary through adaptive management.

Additional mitigation measures that will be implemented during construction, specific to peatlands include:

- Construct the Community Access Road through peatland communities using a “floating road” construction methodology to allow for groundwater movement below and through the road embankment. This approach will involve:
  - Completion of a detailed ground survey, further characterizing the peat and local hydrology at a later stage of the project during the pre-construction period / detail design.
  - Site-specific identification of appropriate values for peat strength.
  - Use of a geogrid base to act as a separator and strengthener between the road subgrade fill materials and the peat.

  - Use of additional geogrid and geotextile materials in layers combined with road aggregate material above the embankment fill to form a mechanically stabilized layer. This layer will provide the required strength and stiffness for the road to perform during all seasons, including spring thaw.
  - Design the Floating Road Plan, profile and cross-section for each road section based on context-sensitive design standards, geometry and loading.
  - Provide transitions between “floating road” sections, excavated and fill sections.
  - Schedule construction to allow for primary settlement of the peat without risk of shear failure.
  - Monitor the work through construction, measuring and recording lateral movement and settlements. Be prepared to adjust the design based on observation and monitoring.

- During detail design, carefully consider placement of culverts in peatland environments with a particular emphasis on the installation of culverts in areas where the road runs perpendicular to the natural flow of groundwater. This can help to minimize the impacts on local carbon and methane emissions and the increased enzyme activity noted above (Saraswati and Strack, 2019; Saraswati et al., 2019; Saraswati et al., 2023);
- Have Environmental Monitors and Indigenous Environmental Monitors onsite during construction to confirm that all mitigation measures are being implemented appropriately. Details regarding Environmental Monitors and their role during the project will be determined through the development of the Environmental Protection Plan;
- Design and implement a pre-, during- and post-construction monitoring program that assesses surface and groundwater movement and allows for the maintenance of pre-construction conditions to the extent feasible. This includes the creation of a monitoring program that involves geochemical testing on exposed bedrock and soils to assess the potential for acid rock drainage and / or metal leaching as it relates to methylmercury production in peatland communities present within the Construction Disturbance Area. The program will also monitor potential increases in methylmercury production related to changes in groundwater levels as a result of the construction of the Community Access Road; and
- Implement adaptive management measures if groundwater flow patterns are determined to be significantly altered. Adaptive management measures will be determined through the development of the Environmental Protection Plan.

9.3.5.3.4.3 Predicted Residual Effects

With the implementation of the recommended mitigation measures, changes to groundwater quantity and quality will be minimized and impacts on retained peatland ecosystems should be minimal. However, this assumes that the mitigation measures will be sufficient to maintain pre-construction drainage patterns and groundwater regimes.

Changes to groundwater quantity because of are predicted to result in a residual effect on peatlands and this interaction is carried forward to the residual effects characterization.

Based on the weight of evidence from the analysis, uncertainty in effects predictions, specifically those associated with the “floating road” approach to construction and operation (refer to Appendix W), and application of the precautionary approach, Project-related changes in the availability, distribution, composition, and function of peatland ecosystems could occur. Concerns were expressed by multiple Indigenous communities that reviewed the Draft Environmental Assessment / Impact Statement due to high uncertainty with the effects that the “floating road” construction will have in peatland ecosystems through this pathway. As a result, the residual effects as a result of changes to groundwater on peatland ecosystems are determined to be significant. As such, this Project–environment interaction is carried forward to cumulative effects.

9.3.5.3.5 Changes to Peatland Ecosystems as a Result of the Introduction and Spread of Invasive Plant Species

9.3.5.3.5.1 Potential Effects

During construction, the regular movement of vehicles, equipment and personnel in-and-out of the Construction Disturbance Area could introduce and transport invasive plant seeds or plant parts into new areas, including peatlands, inside and adjacent to the Construction Disturbance Area.

The introduction and spread of invasive plant species can affect plant community composition and function over the long term. This is a particular concern for the Project given its remote nature and current absence of invasive plant species from the Project area. Indigenous communities, including Aroland First Nation, have concerns related to the potential spread of invasive species (Dillon, 2024b). Fort Albany First Nation has suggested that changes to peatlands resulting in native species to decline could allow invasive species to encroach (Fort Albany First Nation, 2020).

Site hydrology and nutrient availability in peatlands can play a role in maintaining native plant assemblages and limiting the presence of unwanted flora. Factors such as permanently saturated environments, limited nutrients, or low pH levels can all act as deterrents for the establishment of certain non-native and invasive species (Dubé et al.,

2011). For example, certain non-native or invasive species shown to have large impacts on mineral wetlands may not be as adapted to the acidic conditions of a bog. However, changes to a site's hydrology and the drying out of a site could lead to more favourable conditions for these species to establish (Irish Peatland Conservation Council, 2009). Furthermore, their introduction could create a negative feedback loop where, once a species gains a foothold within a community type, it facilitates further modification of a site so it becomes more suitable for the proliferation of that and other non-native. For example, European Reed (Phragmites australis subsp. australis) is known to alter the availability of water in a site by transpiring water faster than the surrounding native vegetation (Nichols, 2020). This could create drier, less acidic conditions that would allow for further establishment of this species along roadside edges.

9.3.5.3.5.2 Mitigation and Enhancement Measures

The following mitigation measures are recommended:

- An Environmental Protection Plan will be developed during detail design, and will be implemented during construction to prevent, detect, control (for example, remove), and monitor areas with invasive species. The plan should also include the following measures:
  - Thoroughly inspect and clean construction equipment and vehicles prior to bringing them to the work area and when moving between work areas within the Project. Cleaning will be completed in accordance with the most up to date version of the Clean Equipment Protocol for Industry (Halloran et al., 2013). Documentation of the results of each inspection will be a requirement of the Environmental Protection Plan. Additional recommendations for the cleaning of equipment (for example, the use of specific cleaning stations and their location) will be determined through the development of the Environmental Protection Plan.
- Use reduced disturbance techniques to prevent topsoil removal and preserve adequate substrate (for example, use a low impact method to leave the surface vegetation root mat intact).
- Contour disturbed areas to minimize soil and water erosion and encourage growth of native vegetation.
- Limit off-road vehicle use by owner / operator during construction. Inspections and maintenance activities will include cleaning of off-road vehicles before and after each use to prevent the spread of invasive species. Recommendations related to the use of off-road vehicles will be determined at detail design and / or through the development of the Environmental Protection Plan.

- Use seed mixes with appropriate native species for all seeding and restoration works. Seed mixes must be tested / certified to be free of invasive species. Native seed should be sourced from local populations whenever possible.
- Require that the road operator follow Ministry of Transportation Ontario Provincial Standard Specification 803 to avoid spreading invasive plant species.

9.3.5.3.5.3 Predicted Residual Effects

With the implementation of the recommended mitigation measures and continued monitoring and control of invasive species, impacts on the retained peatland communities should be minimal. However, this assumes that mitigation measures are effectively implemented, and all observations of invasive species are reported and addressed immediately. The introduction and spread of invasive plant species during construction are predicted to result in a residual effect on peatland ecosystems and this interaction is carried forward to the residual effects characterization.

After implementation of mitigation, effects from the introduction of invasive plants are predicted to be possible, reversible in the short term, infrequent, and confined to the Construction Disturbance Area. Effects from the introduction of invasive plants on peatlands in the effects assessment Local Study Area are anticipated to be negative but negligible in magnitude. As a result, the residual effects on peatlands due to the introduction and spread of invasive plant species are determined to be not significant. As such, this Project–environment interaction was not carried forward to cumulative effects.

9.3.5.3.6 Changes to Peatland Ecosystems as a Result of Fragmentation and Edge Effects

9.3.5.3.6.1 Potential Effects

Clearing within an otherwise intact landscape introduces new fragmentation and a range of edge effects on retained peatland ecosystems, which could be particularly evident in forested swamp communities. Edge effects include the introduction and spread of invasive species, as well as sunscald, desiccation and windthrow, which alter the microclimate of the retained communities. These effects influence the composition and function of the retained peatland ecosystems resulting in secondary effects (for example, altering habitat use by certain wildlife species). These secondary or indirect edge effects generally extend further into a forest than forest structural changes (Franklin et al., 2021). In Ontario, sunscald, desiccation, and windthrow effects are typically experienced to a greater degree (or penetrate further into the retained treed community) on south and west-facing edges due to more solar exposure and prevailing

westerly winds (Hylander, 2005; Honnay et al., 2002; Murcia, 1995). However, boreal forests have been shown to be less influenced by edge effects than tropical and temperate forests (Franklin et al., 2021) because they are adapted to large-scale natural disturbances (for example, fire, windthrow, and insect outbreaks), typically have a short canopy height and more widely spaced trees (relative to temperate and tropical forests and especially in open fens and bogs), and have natural vegetation community heterogeneity (Harper et al., 2015). Nevertheless, some edge effects on peatland ecosystems are anticipated to occur in the Project area and are expected to be more pronounced on the south and west-facing edges of forested swamps. Edge effects on open bog, fen and organic marsh peatland communities are likely to be more related to hydrological or hydrogeological changes introduced by the new road or construction "edge" where the pooling of water or drying of peat may occur depending on the peatlands and the location of the road relative to the flow of surface water or groundwater.

As discussed in the Vegetation Technical Support Document (**Appendix J**), while the landscape in the Project area is largely intact, there are anthropogenic and natural disturbances that have influenced the landscape. Notably, natural disturbances (primarily fire) have occurred over 20,741.7 hectares (18 percent) of the effects assessment Local Study Area, while anthropogenic disturbances cover 364.2 hectares (<1 percent) of the effects assessment Local Study Area. In the effects assessment Regional Study Area, natural disturbances (primarily fire) have occurred over 170,289.3 hectares (27 percent) and anthropogenic disturbances cover a total of 4,109.2 hectares (<1 percent). These disturbances have caused minor fragmentation and edge effects on the existing landscape. The Project will create new anthropogenic disturbances layered over the existing disturbance regime. The total Construction Disturbance Area footprint is 4,700.2 ha. Additional analysis on disturbance within the effects assessment Local and Regional Study Areas is provided in the Vegetation Technical Support Document (**Appendix J**).

9.3.5.3.6.2 Mitigation and Enhancement Measures

Mitigation measures that will be implemented during construction are as follows:

- Adjust the alignment or clear off-centre within the right-of-way to minimize peatland fragmentation and the creation of new wooded peatland edges, where feasible. These details will be refined during detail design;
- Construct temporary laydown areas and temporary construction camps on existing disturbed areas, wherever possible. The availability of existing disturbed areas for the construction of temporary laydown areas and temporary construction camps will be determined at detail design;

- Avoid grubbing along newly created forested swamp edges to promote natural regeneration, which will quickly "seal" the new forested swamp edge;
- Use reduced disturbance techniques during construction to prevent topsoil removal, preserve adequate substrate (for example, use a low impact method to leave the surface vegetation root mat intact). Recommendations for reduced disturbance techniques will be described in detail design; and
- Use progressive restoration onsite once temporary work areas (for example, staging areas) are no longer needed. Progressive restoration techniques will be provided in the Environmental Protection Plan.

9.3.5.3.6.3 Predicted Residual Effects

Changes to the retained peatland ecosystems resulting from fragmentation and edge effects during construction are predicted to result in a residual effect and this interaction is carried forward to the residual effects characterization.

After implementation of mitigation, edge effects are predicted to be probable, reversible in the medium-term, frequent, and limited to the effects assessment Local Study Area. These edge effects are anticipated to be negative, but negligible in magnitude, particularly given that boreal forests are generally adapted to large-scale natural disturbances (Harper et al., 2015) and are less influenced by fragmentation and edge effects than temperate and tropical forests (Franklin et al., 2021). As a result, residual effects as a result of edge effects on peatland ecosystems are determined to be not significant. As such, this Project–environment interaction is carried forward to cumulative effects.

9.3.5.3.7 Changes to Peatland Ecosystems from the Release of Sediment

9.3.5.3.7.1 Potential Effects

The Community Access Road has the potential to result in the release of sediment from vegetation clearing, earth-moving, pit and quarry development and other construction activities. Sediment release into adjacent retained peatland ecosystems can have an effect on the composition and function of those communities. It is expected that the effects on peatlands would be very localized but could include vegetation smothering and changes to drainage patterns and infiltration in the area of sediment deposits.

9.3.5.3.7.2 Mitigation and Enhancement Measures

Mitigation measures that will be further developed during detail design, and implemented during construction include:

- Develop and implement a Project-specific Environmental Protection Plan;
- Develop and implement a Project-specific Erosion and Sediment Control Plan. Erosion and sediment control measures will be developed and implemented in accordance with Ontario Provincial Standard Specifications (Ministry of Transportation, 2021a, 2021c). Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction. Installed erosion and sediment control measures are not expected to affect the water movement to peatlands;
- Regularly inspect and maintain Erosion and Sediment Control structures (for example, sediment fences, rip rap or other sediment control structures) in accordance with Ontario Provincial Standard Specifications during all phases of the Project and modify measures as necessary (Ministry of Transportation, 2021a). If control measures are not functioning properly, no further work will occur until the problem is resolved;
- Stabilize disturbed areas through revegetation with native plant species or other appropriate means (for example, erosion control blankets) following completion of the works;
- Reschedule work or reduce / detour traffic in areas where soils are considered to be excessively wet or where there is a heavy rainfall risk. Areas where a reduction in traffic or detours are required are unknown at this design stage;
- Earthworks should be avoided during periods of heavy rainfall, particularly in areas adjacent to watercourses and wetlands; and
- Adhere to all mitigation measures outlined in the Fish and Fish Habitat Technical Support Document(**Appendix G**) and the Surface Water Technical Support Document (**Appendix F**).

9.3.5.3.7.3 Predicted Residual Effects

With the implementation of the mitigation measures, specifically implementation of a Project-specific Erosion and Sediment Control Plan, residual effects on retained peatland communities due to the release of sediment are not predicted. Should sediment be released into an adjacent peatland community, the effect is expected to be

localized such that a measurable effect on the availability, distribution, composition, and function of peatlands is not predicted to occur. Therefore, this interaction is not carried forward to the residual effects characterization.

9.3.5.3.8 Changes to Peatland Ecosystems from Spills of Fuel or Other Contaminants

9.3.5.3.8.1 Potential Effects

During Project construction chemical or hazardous material spills (for example, petroleum products) can have detrimental effects on ecosystems in the affected area. Spills that occur in high enough concentrations can contaminate peat and affect peatland organisms and vegetation health and survival, thereby affecting the composition and function of the affected peatland communities and dependant wildlife. Marten Falls First Nation has noted concerns related to pollution from potential collision and / or spills that might occur. The community notes that muskeg (peatland) is particularly susceptible to pollutants and that remediation options related to spills are limited (Marten Falls First Nation, 2023). Aroland First Nation noted similar concerns specific to contamination due to surface level spills / pollution (for example, oil or chemical spill contamination in muskeg due to interconnectedness with nearby surface water) (Fort Albany First Nation, 2024).

Peatlands and peat differ from mineral soils in the way they transport and retain contaminants. Spills in peatlands tend to spread over a larger horizontal gradient in the upper layer of peat due to the higher levels of impermeability of the lower, more decomposed peat and the higher porosity in the surface layer (Gharedaghloo and Price, 2018). This can create a larger impact area via the surface area; however, while the overall impacts on a system depend on the contaminant, the higher biogeochemical interactions in the top layers of peat mean that the transformation or sequestration of contaminants can be quick with many soluble contaminants being efficiently removed from a peatland system through natural process (Price et al., 2023). Therefore, there is a potential that the Project could cause spills of fuel or other contaminants that could negatively affect the composition and function of peatland ecosystems.

9.3.5.3.8.2 Mitigation and Enhancement Measures

Mitigation measures described in the Surface Water Technical Support Document (**Appendix F**), Groundwater Technical Support Document (**Appendix H**), Physiography, Terrain, and Soils Technical Support Document (**Appendix N**), and Vegetation Technical Support Document (**Appendix J**) will be implemented to minimize effects from spills of fuel and other contaminants on peatland ecosystems.

9.3.5.3.8.3 Predicted Residual Effects

There are predicted to be no residual effects from chemical or hazardous material spills on surface water quality, groundwater, soil, or vegetation quality during construction or Operations. The implementation of mitigation measures is expected to effectively avoid and minimize the frequency, spatial extent, and severity of spills of chemicals and / or hazardous materials on site. Spills are expected to occur infrequently and are not expected to result in a measurable change to the availability, distribution, composition, and function of peatlands relative to existing conditions. As a result, there are expected to be no residual effects on peatland ecosystems resulting from spills of fuel or other contaminants and this interaction was not carried forward to the residual effects characterization.

9.3.5.3.9 Changes to Peatland Ecosystems from the Deposition of Air Contaminants

9.3.5.3.9.1 Potential Effects

Construction of the Community Access Road is expected to generate air particulate emissions, including carbon monoxide, sulphur oxides (including sulphur dioxide), and nitrogen oxides. Construction activities are expected to produce air emissions from the use of construction vehicles, motorized equipment and machinery, power generators (to be used at temporary construction camps and temporary pits and quarries), the use of explosives (blasting), and the burning of non-hazardous waste materials (for example, food garbage at temporary construction camps).

The deposition of criteria air contaminant emissions can result in changes to soil and surface water quality, which has the potential to alter plant community structure, composition, and diversity by modifying the pH, nutrient content, and abundance and diversity of living organisms in the soil. Soil acidification can result from the deposition of sulphate and nitrogen oxides and uptake of these contaminants by plants can cause varying levels of effects on vegetation in peatland ecosystems depending on the concentrations and durations of deposition.

Air quality modelling was used to predict maximum ground-level concentrations of criteria air contaminant emissions during construction and operations. The methods and results for air quality modelling are presented in detail in the Atmospheric Environment Technical Support Document (**Appendix S**). During construction, most air criteria contaminants were predicted to be below Canadian Ambient Air Quality Standards and / or Ontario Ambient Air Quality Criteria thresholds. However, threshold exceedances for the Project were noted for nitrogen dioxide and sulphur dioxide, carbon monoxide, acrolein, and benzo(a)pyrene emissions. Most threshold exceedances were limited to less than 760 metres from the emission source. The exceptions to this distance threshold are nitrogen

dioxide, sulphur dioxide, and carbon monoxide emissions during quarry blasting. During quarry blasting, nitrogen dioxide and sulphur dioxide emissions thresholds may be exceeded by up to 12.3 kilometres, while carbon monoxide emissions may exceed the Ontario Ambient Air Quality Criteria threshold out to 1.5 kilometres.

It should be noted that the air quality modelling incorporated conservative assumptions (such as, using worst-case scenarios) so effects would not be underestimated.

9.3.5.3.9.2 Mitigation and Enhancement Measures

A list of mitigation measures that will be implemented to limit air particulate emissions during construction is provided in the Atmospheric Environment Technical Support Document (**Appendix S**). The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Environmental approval conditions, permits, or authorizations issued for Project Construction, including those issued from Environment and Climate Change Canada, the Ontario Ministry of the Environment, Conservation and Parks and the Ontario Ministry of Natural Resources, will be followed during construction.

9.3.5.3.9.3 Predicted Residual Effects

Even with mitigation, the Community Access Road is expected to have residual effects on peatland ecosystems as a result of emissions of criteria air contaminants. As such, residual effects from air contaminants to peatland ecosystems were carried forward into the residual effects characterization.

After implementation of mitigation, soil contamination from the emissions of criteria air contaminants is predicted to be possible, permanent (irreversible), continuous, and confined to the effects assessment Local Study Area. These effects will be negative but negligible in magnitude. As a result, the residual effects as a result of soil contamination from deposition of air contaminants on peatland ecosystems are determined to be not significant. As such, this Project–environment interaction is carried forward to cumulative effects.

9.3.5.3.10 Changes to Peatland Ecosystems from Fugitive Dust Emissions

9.3.5.3.10.1 Potential Effects

Fugitive dust emissions are expected to be produced by the Project during construction activities such as land clearing, blasting, and infrastructure implementation (**Appendix S**). Accumulation of airborne dust produced from the Project may result in local and direct

changes to peatland ecosystems; for example, deposition of airborne dust onto vegetation in peatland ecosystems can smother plant tissues, hinder gas exchange, and reduce photosynthesis by physically blocking sunlight. Dust particles often contain metals or pollutants, which can leach into the soil and lead to toxicity or nutrient imbalances in plants (Hirano et al., 1995; Prajapati, 2012). Consequently, the deposition of dust can affect plant health, and alter plant species composition, structure, and biomass in affected areas. Indigenous communities including Weenusk First Nation have noted concerns specific to impacts related to air quality as a result of fugitive dust from movement and operations of construction equipment and vehicles (MNP LLP, 2024b).

Air quality modelling was used to predict maximum ground-level concentrations of criteria air contaminant emissions during construction (**Appendix S**). During construction, threshold exceedances for the Project are predicted for total suspended particulate, particulate matter emissions less than 2.5 micrometres and particulate matter less than 10 micrometres. Threshold exceedances for dust emissions are predicted to be reached at less than 300 metres from the emission source.

It should be noted that the air quality modelling incorporated conservative assumptions (such as, using worst-case scenarios) so effects were not underestimated.

9.3.5.3.10.2 Mitigation and Enhancement Measures

A list of mitigation measures that will be implemented to limit dust deposition during construction is provided in the Atmospheric Environment Technical Support Document (**Appendix S**). These measures will be implemented to minimize effects from dust emissions and deposition on peatland ecosystems. The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction.

9.3.5.3.10.3 Predicted Residual Effects

Although mitigations will be implemented to reduce dust emissions, dust deposition during construction are predicted to degrade vegetation within peatland communities immediately adjacent to the Project (within 100 metres). There are currently no plans to decommission the Project and dust deposition is expected over the life of the Project.

Even with mitigation, residual effects from dust emissions on peatland ecosystems are expected to occur and are therefore carried forward into the residual effects characterization.

Effects from dust emissions are predicted to be certain, permanent (irreversible), continuous, and confined to the effects assessment Local Study Area. Effects from dust emissions on peatland ecosystems in the effects assessment Local Study Area are anticipated to be negative, but negligible in magnitude. As a result, the residual effects as a result of fugitive dust emissions on peatland ecosystems are determined to be not significant because the effects from dust are not expected to affect the ability of peatland ecosystems to be self-sustaining and ecologically effective at the Regional Study Area level. As such, this Project–environment interaction is carried forward to cumulative effects.

9.3.5.3.11 Changes to Peatland Ecosystems as a Result of Increased Access

9.3.5.3.11.1 Potential Effects

The construction of the Community Access Road and associated infrastructure (for example, pits and quarries, temporary access roads, and worker camps) could cause changes to peatland ecosystems as a result of increased public access. Marten Falls First Nation has noted concerns about illegal dumping of waste in muskegs (such as, peatlands), including potential leaching of contaminants into the water table. The community noted that illegal dumping of waste is already a problem with the Winter Access Road (such as people leaving behind drums, vehicles, and other materials). One community member noted the importance of the muskeg (in other words, peatlands), highlighting that “the muskeg is just like our bodies, if we get sick, and then the whole body gets sick”, referring to the interconnections between the muskeg (such as, peatlands) and other components of the environment (Marten Falls First Nation, 2023). Additionally, Weenusk First Nation noted concerns related to impacts on harvestable species within the community’s traditional territory as a result of increased access (MNP LPP, 2024b).

Increased public access is anticipated to be limited during construction. However, members of the public may illegally use constructed portions of the Construction Disturbance Area to access areas that were previously inaccessible or more difficult to access for hunting, fishing, plant or timber harvesting.

9.3.5.3.11.2 Mitigation and Enhancement Measures

The following mitigation measures will be implemented during construction:

- Limit the Project footprint, vegetation clearing and access road requirements to the extent feasible (for example, share / coordinate access, concentrate temporary activities spatially, leave habitat outside the scoped Construction Disturbance Area, selective clearing, and use existing access roads when available). Reducing cleared areas and the number of access roads through coordination, can reduce the number of cleared areas and access roads that will be present during and following construction that may provide access to previously inaccessible lands;
- Use progressive restoration onsite once temporary work areas (for example, staging areas) are no longer needed and prevent ongoing use of inactive areas through combined use of physical control measures (rollback, removal of creek crossings, recontouring to surrounding topography, revegetation / reforesting and / or barriers at junctions with active access);
- Restrict access to the effects assessment Construction Disturbance Area to construction personnel;
- Develop a policy for Project personnel while on shift or at temporary construction camps regarding any plant or timber harvesting activities; and
- Develop a wildfire prevention plan for the construction works that outlines protocols for hot works or any other activity with the potential to trigger a fire, required fire suppression equipment, and a response plan if a fire is triggered.

9.3.5.3.11.3 Predicted Residual Effects

Public access is difficult to monitor and control, however the effects on peatlands (aside from the secondary effects including increased risk of spills of contaminants and spread of invasive species, which are addressed separately) from increased public access would be negligible. Increased public access is not predicted to result in a measurable negative effect on peatlands, therefore, this interaction is not carried forward to the residual effects characterization.

9.3.5.3.12 Changes to Peatland Carbon Storage Flux

9.3.5.3.12.1 Potential Effects

Construction of the proposed Community Access Road could have a negative impact on soil organic carbon storage and carbon dioxide and methane fluxes currently occurring

within the Construction Disturbance Area. Changes to peatland carbon storage flux has been noted as a concern by Indigenous communities who have provided feedback on the Project including Fort Albany First Nation and Weenusk First Nation (Firelight Research Inc., 2024; Fort Albany First Nation, 2020; Weenusk, 2024b). **Table 9.3-14** presents the calculated rates of storage and fluxes for the Construction Disturbance Area compared to the effects assessment Local Study Area.

Table 9.3-14: Summary of Carbon Storage and Carbon and Methane Flux within the Construction Disturbance Area

Type of Storage and Flux	Total for the Effects Assessment Local Study Area	Total for the Construction Disturbance Area	Percent of Value Calculated for the Effects Local Study Area
Soil Organic Carbon Storage (tonnes of carbon)	58,224,122 to 60,456,711	1,378,912 to 1,382,779	2%
Daily Carbon Dioxide Flux (tonnes of Carbon dioxide per day)	-294 ± 1,014	0.06 ± 17	0%
Seasonal Carbon Dioxide Flux (tonnes of Carbon dioxide per growing season)	-9,009 ± 31,041	1.88 ± 531	0%
Daily Methane Flux (tonnes of methane per day)	12 ± 4	0.32 ± 0.14	3%
Seasonal Methane Flux (tonnes of methane per growing season)	1,843 ± 609	49 ± 22	3%

Footnotes:- = negative; ± = plus or minus

Based on the summary presented in **Table 9.3-14** overall soil organic carbon storage within the Construction Disturbance Area represents 2 percent of the total soil organic carbon storage present in the effects assessment Local Study Area. The Construction Disturbance Area also represents 3 percent of the total daily and seasonal methane flux within the effects assessment Local Study Area.

For carbon dioxide flux, the Construction Disturbance Area differed from the effects assessment Local Study Area in that peatlands in the Construction Disturbance Area are considered an overall source of carbon dioxide rather than a sink. This was also confirmed through an analysis completed as part of the Atmospheric Environment Technical Support Document - Volume 2 (**Appendix S**) on the potential effects from Land Use Changes within the Construction Disturbance Area. This finding is largely due to a higher percentage of organic swamp peatlands in the Construction Disturbance Area (61 percent compared to 36 percent in the effects assessment Local Study Area). These peatlands are considered a source of carbon dioxide, not a carbon dioxide sink like bogs

and fens. In other words, the Construction Disturbance Area will remove more peatlands that are considered a carbon source than those that are considered a carbon sink.

9.3.5.3.12.2 Mitigation and Enhancement Measures

To limit the disturbance and excavation of peat, a “floating road” construction methodology will be utilized where the proposed Community Access Road will be constructed on top of the peat. In addition, the following mitigation measures should be implemented during construction.

- Limit vegetation clearing to within the 100 metre right-of-way and reduce clearing to less than this width whenever and wherever possible;
- Minimize clearing widths in peatland ecosystems given the difficulty of restoring these systems.
  - Adjust the alignment or clear off centre within the right-of-way where warranted, to minimize effects on peatland ecosystems. These details will be refined during detail design, prior to construction;
  - Limit clearing of riparian vegetation (in other words, within 30 metres of waterbodies) to the extent possible and to the requirement of the access road and alignment clearing width only; and
  - Locate temporary access roads, staging areas, camps, and debris and / or timber stockpiles in less sensitive ecosystems (for example, upland ecosystems), where possible. Avoid peatland communities for temporary features wherever possible.
- Decommission and rehabilitate temporary access roads, staging areas, camps, and debris and / or timber stockpiles following construction. Details related to peatland rehabilitation will be determined at detail design and / or when the Vegetation Restoration Plan is developed;
- Prepare and Implement a Vegetation Restoration Plan that includes measures specific to peatland communities and peatland restoration, including peat stockpile management. These measures will be determined at detail design and / or when the Vegetation Restoration Plan is developed. This plan will be developed through engagement and consultation with Indigenous communities and integration of local Indigenous Knowledge and stewardship protocols; and
- Prepare and implement a Final Biodiversity Offset Plan. The Preliminary Biodiversity Offset Plan can be found in **Appendix AB**.

9.3.5.3.12.3 Predicted Residual Effects

With the implementation of a “floating road” construction methodology in peatland communities, minimal change to the overall carbon storage capacity of the peat within the Construction Disturbance Area is anticipated. Any changes in storage capacity will be limited to areas where peat excavation may be required for specific Project components (in other words, construction of footings for a crossing structure) and the loss of living and dead organic matter that may be removed to support the proposed construction (for example, in thicket or treed peatland communities). The proposed Community Access Road is also expected to create a permanent barrier between the underlying peat and atmosphere. As such, both the carbon and methane flux within the Construction Disturbance Area will permanently cease to the extent indicated in **Table 9.3-14** for the Construction Disturbance Area and effects assessment Local Study Area. The effects assessment Local Study Area daily and seasonal methane flux will be reduced by approximately 3 percent, which would be considered a minor net benefit. Additionally, peatlands within the Construction Disturbance Area are minor carbon source rather than carbon sinks. Therefore, the effect of the proposed Community Access Road on carbon storage and carbon and methane flux within the effects assessment Local Study Area is expected to be negligible and this interaction is not carried forward to the residual effects characterization.

9.3.5.4 Residual Effects – Operations Phase

9.3.5.4.1 Changes to the Availability and Distribution of Peatland Ecosystems as a Result of Direct Peatland Loss

9.3.5.4.1.1 Potential Effects

Operations activities, such as culvert or bridge replacements, may result in disturbance to peatland communities. However, given the conservative assumptions regarding the footprint area for construction, it is assumed that these potential future disturbances are already captured in the calculation of permanent loss during construction and would not represent additional direct loss of peatlands.

9.3.5.4.1.2 Mitigation and Enhancement Measures

The following mitigation measures are recommended during operations:

- Avoid re-entry and disturbance of restored temporary access areas post-construction.

9.3.5.4.1.3 Predicted Residual Effects

With the implementation of mitigation measures, and the conservative assumptions applied for construction, no additional clearing or disturbance of peatland ecosystems is expected during Operations. Therefore, this interaction was not carried forward to the residual effects characterization.

9.3.5.4.2 Changes to the Composition and Function of Peatland Ecosystems as a Result of Direct Peatland Loss

9.3.5.4.2.1 Potential Effects

Operations activities, such as culvert or bridge replacements, may result in disturbance to peatland communities. However, given the conservative assumptions regarding the footprint area for construction, it is assumed that these potential future disturbances are already captured in the calculation of permanent loss during construction and would not represent additional direct loss of peatlands.

9.3.5.4.2.2 Mitigation and Enhancement Measures

Mitigation measures that will be implemented during operations to minimize direct loss of peatlands wherever and whenever possible are outlined in **Section 9.3.5.4.1.**

9.3.5.4.2.3 Predicted Residual Effects

With the implementation of mitigation measures, and the conservative assumptions applied for construction, no additional clearing or disturbance of peatland ecosystems is expected during Operations. Therefore, this interaction was not carried forward to the residual effects characterization.

9.3.5.4.3 Changes Peatland Ecosystems as a Result of Changes to Hydrology Potential Effects

9.3.5.4.3.1 Potential Effects

Long-term residual changes to surface water quantity are predicted during operations as a result of changes in channel hydraulics at waterbody crossings and changes in land cover (**Appendix F**). These residual effects have been assessed as likely to cause minimal changes to stream flows and / or water levels at receiving waterbodies and be limited to, at most, the spatial extent of the Local Study Area (**Appendix F**). This finding has been extrapolated to indicate that the resulting residual effects on peatland ecosystems is likewise expected to be minimal and limited to the Local Study Area during Operations.

9.3.5.4.3.2 Mitigation and Enhancement Measures

A comprehensive list of mitigation measures to limit changes to surface water quantity and quality during Operations is provided in the Surface Water Technical Support Document (**Appendix F**). The effectiveness of mitigation measures will be evaluated during operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.3.5.4.3.3 Predicted Residual Effects

With the implementation of the recommended mitigation measures, changes to hydrology will be minimized and impacts to retained peatland ecosystems should be minimal. However, this assumes that the mitigation measures will be sufficient to maintain pre-construction drainage patterns. It is expected that a robust monitoring program will be undertaken, and adaptive management measures implemented, as required. Changes to peatland ecosystems as a result of changes to hydrology is predicted to result in a residual effect and this interaction is carried forward to the residual effects characterization.

Changes to peatland ecosystems resulting from changes in hydrology that may alter drainage patterns and increase or decrease drainage flows and surface water levels are expected to be negative in direction, negligible in magnitude, local in geographic extent, long-term, infrequent, irreversible, and possible. As a result, the residual effects as a result of changes to hydrology on peatland ecosystems are determined to be not significant.

9.3.5.4.4 Changes to Peatland Ecosystems as a Result of Changes to Groundwater

9.3.5.4.4.1 Potential Effects

During the Operations Phase, short-term water takings from groundwater sources may be required for the repair of below ground structures such as footings or culverts. Additionally, aggregate extraction below the water table at pits or quarries may lower local groundwater levels. Periodic extraction from pits and quarries is expected to continue at some sources to provide material for road maintenance during operations.

Clearing of the effects assessment Construction Disturbance Area and resulting changes to vegetation cover may change groundwater infiltration rates from precipitation relative to the existing conditions. Areas that were cleared during construction but not maintained for use are expected to gradually return to similar existing conditions through active or passive restoration processes. In remaining areas, these changes to groundcover will persist for lifetimes of the road right-of-way and any

access roads, laydown areas, or pits and quarries that are maintained or re-activated for use during operations.

Equipment and vehicles used during operations will have the potential for malfunctions or accidents to cause leaks of fuels, oils, lubricants, coolants, and other potential contaminants. Storage and transfer of fuels and other chemicals in the effects assessment Construction Disturbance Area during operations also pose a risk of accidental spills. These accidental spills and leaks may contact the ground and migrate to the water table causing contamination of the groundwater.

9.3.5.4.4.2 Mitigation and Enhancement Measures

A list of mitigation measures to limit changes to groundwater quantity and quality during Operations is provided in the Groundwater Technical Support Document (**Appendix H**).

9.3.5.4.4.3 Predicted Residual Effects

With the implementation of the recommended mitigation measures, changes to groundwater quantity and quality will be minimized and impacts on retained peatland ecosystems should be minimal. However, this assumes that the mitigation measures will be sufficient to maintain pre construction drainage patterns and groundwater regimes. Changes to groundwater quantity because of are predicted to result in a residual effect on peatlands and this interaction is carried forward to the residual effects characterization.

Changes to peatland ecosystems resulting from changes in groundwater that may alter drainage patterns, impair groundwater quality, and increase or decrease groundwater levels are expected to be negative in direction, medium in magnitude, local in geographic extent, long term, continuous, irreversible, and probable. However, there is high uncertainty in the magnitude of predicted effects of the “floating road” on the maintenance of peatland function. Concerns were expressed by multiple Indigenous communities that reviewed the Draft Environmental Assessment / Impact Statement due to high uncertainty with the effects that the “floating road” construction will have in peatland ecosystems through this pathway. As a result, the residual effects as a result of changes to groundwater on peatland ecosystems are determined to be significant. As such, this Project–environment interaction is carried forward to cumulative effects.

9.3.5.4.5 Changes to Peatland Ecosystems as a Result of the Introduction and Spread of Invasive Plant Species

9.3.5.4.5.1 Potential Effects

During the operations phase, regular vehicle traffic on the Community Access Road could transport invasive plant seeds or plant parts into the effects assessment Local Study Area. The indirect effects on peatlands resulting from the introduction and spread of invasive species described above, are also relevant to the operations phase.

9.3.5.4.5.2 Mitigation and Enhancement Measures

The following mitigation measures are recommended during Operations:

- Include the following measures as part of the Environmental Protection Plan to prevent, detect, control (in other words, remove), and monitor areas with invasive species:
  - Limit off-road vehicle use by owner / operator during operations. Inspections and maintenance activities will include cleaning of off-road vehicles before and after each use to prevent the spread of invasive species;
  - Require that the road operator follows Ministry of Transportation Ontario Provincial Standard Specification 803 to avoid spreading invasive plant species;
  - Remove and manage invasive species using manual and mechanical means. Herbicides will not be used; and
  - Design and implement a post-construction invasive species monitoring program to detect invasive species presence and control (in other words, remove) new introductions. Details of the post-construction invasive species monitoring program will be included in the Environmental Protection Plan.

9.3.5.4.5.3 Predicted Residual Effects

With the implementation of the recommended mitigation measures and continued monitoring and control of invasive species, impacts on the retained peatland communities should be minimal. However, this assumes that mitigation measures are effectively implemented. Additionally, introduction of invasive plant species may be higher during operations due to public use of the Community Access Road. The introduction and spread of invasive plant species during Operations are predicted to result in a residual effect on peatland ecosystems and this interaction is carried forward to the residual effects characterization.

After implementation of mitigation, effects from the introduction of invasive plants are predicted to be possible, reversible in the short term, infrequent, and confined to the Construction Disturbance Area. Effects from the introduction of invasive plants on peatlands in the effects assessment Local Study Area are anticipated to be negative but negligible in magnitude. As a result, the residual effects on peatlands due to the introduction and spread of invasive plant species are determined to be not significant. As such, this Project–environment interaction is carried forward to cumulative effects.

9.3.5.4.6 Changes to Peatland Ecosystems as a Result of Fragmentation and Edge Effects

9.3.5.4.6.1 Potential Effects

It is not expected that the operations phase will introduce new fragmentation or edge effects to the retained peatland communities.

9.3.5.4.6.2 Mitigation and Enhancement Measures

No additional mitigation measures are recommended during operations.

9.3.5.4.6.3 Predicted Residual Effects

No residual effects are predicted during operations phase.

9.3.5.4.7 Changes to Peatland Ecosystems from the Release of Sediment

9.3.5.4.7.1 Potential Effects

There is potential that activities during operations may cause the release of sediment to adjacent retained peatland ecosystems. Large precipitation events may lead to run-off from the road and sedimentation in low lying areas including peatland ecosystems. The effects would be localized, intermittent and variable throughout the year.

9.3.5.4.7.2 Mitigation and Enhancement Measures

The mitigation measures established and refined using adaptive management during construction should be maintained during operations.

9.3.5.4.7.3 Predicted Residual Effects

No residual effects are predicted during operations.

9.3.5.4.8 Changes to Peatland Ecosystems from Spills of Fuel or Other Contaminants

9.3.5.4.8.1 Potential Effects

There is the potential for accidental spills of fuels and other materials resulting from vehicle collisions during Operations and from malfunctions of equipment or spills during equipment or vehicle refuelling for maintenance activities. The indirect effects on peatlands resulting from spills of fuel or other contaminants during Operations are the same as discussed in the Construction section, above.

9.3.5.4.8.2 Mitigation and Enhancement Measures

During Operations mitigation measures will include posting and enforcement of a speed limit on the highway, which should reduce potential for chemical or hazardous material spills by reducing vehicle collision risk.

Comprehensive lists of mitigation measures to limit the risk and effects from spills of fuel and other contaminants during Operations are provided in the Surface Water Technical Support Document (**Appendix F**), Groundwater Technical Support Document (**Appendix H**), Physiography, Terrain, and Soils Technical Support Document (**Appendix N**).

9.3.5.4.8.3 Predicted Residual Effects

There are predicted to be no residual effects from chemical or hazardous material spills on surface water quality, groundwater, soil, or vegetation quality during Operations. The implementation of mitigation measures is expected to effectively avoid and minimize the frequency, spatial extent, and severity of spills of chemicals and / or hazardous materials on site. Spills are expected to occur infrequently and are not expected to result in a measurable change to the availability, distribution, composition, and function of peatlands relative to existing conditions. As a result, there are expected to be no residual effects on peatland ecosystems resulting from spills of fuel or other contaminants and this interaction was not carried forward to the residual effects characterization.

9.3.5.4.9 Changes to Peatland Ecosystems from the Deposition of Air Contaminants

9.3.5.4.9.1 Potential Effects

Operations

During the operations phase of the Community Access Road, emissions will be generated mainly from the use of fossil fuels associated with vehicle use of the Community Access Road t and road maintenance (general, seasonal, and special maintenance).

As discussed in the Atmospheric Environment Technical Support Document (**Appendix S**), air criteria contaminants are predicted to be below Canadian Ambient Air Quality Standards and / or Ontario Ambient Air Quality Criteria thresholds during operations.

It should be noted that the air quality modelling incorporated conservative assumptions (such as, using worst-case scenarios) so effects would not be underestimated.

9.3.5.4.9.2 Mitigation and Enhancement Measures

A comprehensive list of mitigation measures that will be implemented to limit air particulate emissions during operations is provided in the Atmospheric Environment Technical Support Document (**Appendix S**). The effectiveness of mitigation measures will be evaluated during operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.3.5.4.9.3 Predicted Residual Effects

During the operations phase emissions of criteria air contaminants may have negative effects on water, soils, vegetation, and associated peatland ecosystem composition and function. Effects are expected to be larger during construction than during operations.

An Environmental Protection Plan and Environmental Monitoring Plan developed for the Project, which will include adaptive management, are expected to limit the emissions of criteria air contaminants.

Even with mitigation, the Project is expected to have net residual effects on peatland ecosystems as a result of emissions of criteria air contaminants. As such, residual effects from air contaminants to peatland ecosystems were carried forward into the residual effects characterization.

After implementation of mitigation, soil contamination from the emissions of criteria air contaminants is predicted to be possible, permanent (irreversible), continuous, and

confined to the effects assessment Local Study Area. These effects will be negative but negligible in magnitude. As a result, the residual effects as a result of soil contamination from deposition of air contaminants on peatland ecosystems are determined to be not significant. As such, this Project–environment interaction is carried forward to cumulative effects.

9.3.5.4.10 Changes to Peatland Ecosystems from Fugitive Dust Emissions

9.3.5.4.10.1 Potential Effects

Fugitive dust emissions are expected to be produced by traffic on the Community Access Road during Operations. Accumulation of airborne dust produced from the Project may result in local and direct changes to peatland ecosystems as described in the Construction section above.

During Operations, threshold exceedances for the Project are predicted for particulate matter less than 2.5 micrometres, particulate matter less than 10 micrometres and total suspended particulates. The particulate matter less than 2.5 micrometres levels are predicted to reach the 24-hour and annual criteria thresholds at 115 and 134 metres from the road, respectively (**Appendix S**). Levels of particulate matter less than 10 micrometres are predicted to reach the 24-hour threshold at 1,986 metres from the road. Emissions of total suspended particulates are predicted to reach the 24-hour and annual thresholds at 3,004 and 899 metres from the road, respectively.

It should be noted that the air quality modelling incorporated conservative assumptions (such as, using worst-case scenarios) so effects were not underestimated.

9.3.5.4.10.2 Mitigation and Enhancement Measures

A list of mitigation measures that will be implemented to limit dust deposition during Operations is provided in the Atmospheric Environment Technical Support Document (**Appendix S**). The effectiveness of mitigation measures will be evaluated during operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.3.5.4.10.3 Predicted Residual Effects

Although mitigations will be implemented to reduce dust emissions, dust deposition during Operations are predicted to degrade vegetation within peatland communities immediately adjacent to the Project (within 100 metres). There are currently no plans to decommission the Project and dust deposition is expected over the life of the Project.

Even with mitigation, residual effects from dust emissions on peatland ecosystems are expected to occur and are therefore carried forward into the residual effects characterization.

Effects from dust emissions are predicted to be certain, permanent (irreversible), continuous, and confined to the effects assessment Local Study Area. Effects from dust emissions on peatland ecosystems in the effects assessment Local Study Area are anticipated to be negative, but negligible in magnitude. As a result, the residual effects as a result of fugitive dust emissions on peatland ecosystems are determined to be not significant because the effects from dust are not expected to affect the ability of peatland ecosystems to be self-sustaining and ecologically effective at the Regional Study Area level. As such, this Project–environment interaction is carried forward to cumulative effects.

9.3.5.4.11 Changes to Peatland Ecosystems as a Result of Increased Public Access

9.3.5.4.11.1 Potential Effects

The Community Access Road will expand access to remote peatland ecosystems during operations. However, the region will remain relatively remote with the nearest urban centre (in other words, Thunder Bay with a population of approximately 111,000) being over 430 km from Marten Falls. Therefore, a large influx of individuals or groups into the area is not expected. Traffic levels for the Project have been estimated at 700 vehicles per day for the north-south section and 100 vehicles a day for the east-west section of the Community Access Road. These volumes are reflective of the anticipated peak traffic in 2046.

Regardless, increased public access may result in secondary effects such as the introduction and spread of invasive plant species. Non-native and invasive plant species may compete with local native flora. Another secondary effect of increased public access is the spills of fuel or other contaminants during Operations.

Finally, increased public access may also introduce an additional risk of human-ignited wildfire (Morisson, 2007). The Final Climate Adaptation and Resiliency Technical Support Document (**Appendix Y**) also predicts that the warmer weather and less snow in winter that is expected to result from climate change will increase the likelihood of wildfires in the Project area and that the wildfires will burn hotter and faster and consume a greater area than they did historically. This increased wildfire frequency and extent may ultimately influence the availability and distribution, composition, and function of peatlands. This effect cannot be quantified at this time but should be considered in future planning phases and in the development of the monitoring programs.

9.3.5.4.11.2 Mitigation and Enhancement Measures

The following mitigation measures will be implemented during operations:

- Install access controls (for example, gates and boulders) to control public vehicle travel on some temporary access routes and trails; and
- Install signage at regular intervals stating that any dumping is prohibited.

Marten Falls First Nation continues to engage in discussions with the Province regarding the ownership and future operations and maintenance of the Community Access Road. Access and ownership including gating security / ID system will require further dialogue between the communities and the Province.

9.3.5.4.11.3 Predicted Residual Effects

Public access is difficult to monitor and control, however the effects on peatlands (aside from the secondary effects including increased risk of spills of contaminants and spread of invasive species, which are addressed separately) from increased public access would be negligible. Increased public access is not predicted to result in a measurable negative effect on peatlands, therefore, this interaction is not carried forward to the residual effects characterization.

9.3.5.5 Summary of Residual Effects

Table 9.3-15 provides a summary of the potential peatland effects, mitigation measures and residual effects. Detailed information is included in **Appendix I**.

Table 9.3-15: Summary of Residual Effects for Peatlands and Characterization

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Peatland Ecosystems**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Brush and timber disposal • Pits and quarries • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Decommissioning of pits and quarries • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Changes to peatland ecosystem availability, distribution composition and function as a result of direct peatland loss	• Limit vegetation clearing to within the 100 metre right-of-way and reduce to less than this width whenever and wherever possible. Specifically, – Minimize clearing widths in peatland ecosystems to the extent feasible, given the difficulty of effective restoration of these ecosystems. – Adjust the alignment or clear off centre within the right-of-way where warranted, to minimize effects on peatland ecosystems. These details will be refined during detail design, prior to construction. – Limit clearing of riparian vegetation (in other words, within 30 metres of waterbodies) to the extent possible and to the requirement of the access road and alignment clearing width only. – Locate temporary access roads, staging areas, camps, and debris and / or timber stockpiles in less sensitive ecosystems (for example, upland ecosystems), where feasible. Avoid peatland communities for temporary features wherever feasible. • Upon completion of construction, sand and gravel pits, including temporary access roads leading to the pits will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the Aggregate Resource Act, which will include backfilling, levelling, recompacting, and redistributing organic materials. Temporary access roads leading to temporary quarry areas will also be decommissioned. Temporary quarries not required for maintenance activities will be vegetated in accordance with the Rehabilitation Plan. Quarries maintained for operations will be blocked to discourage public use but facilitate access for ongoing road maintenance. The number of quarries required for maintenance are unknown at this time. • Perform clearing and construction activities in winter months where feasible, to minimize compaction of peat. A review of the project construction schedule will be completed during detail design to coordinate work based on environmental timing windows and timing restrictions. • Develop and implement a Project-specific Environmental Protection Plan. • Have Environmental Monitors and Indigenous Environmental Monitors onsite during construction to confirm that all mitigation measures are being implemented	• Residual changes to peatland ecosystem availability and distribution as a result of direct peatland loss	• Direction: Negative • Magnitude: Low • Geographic Extent: Construction Disturbance Area • Duration / Reversibility: – Long term and irreversible (for permanent impacts) – Long term and reversible (for temporary impacts where peatland ecosystems can and will be restored) • Frequency: Continuous • Probability: Certain • Significance: Not Significant • Uncertainty: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				appropriately. Details regarding Environmental Monitors and their role during the project will be determined through the development of the Environmental Protection Plan. • Design and implement a program to monitor for peatland condition in the vicinity of project activities. The program will include science-based thresholds or indicators of peatland condition based on research and established standards, like those presented in Minasny et. al, 2023, as well as mitigation and adaptive response plan to prevent long term damage or carbon release. Details regarding the thresholds and indicators as well as the number of monitoring locations and the length of the monitoring period will be determined in subsequent Project phases. • Prepare and Implement a Vegetation Restoration Plan that includes measures specific to peatland ecosystems and peatland restoration, including peat stockpile management. This plan will be developed through engagement and consultation with Indigenous communities and integration of local Indigenous Knowledge and stewardship protocols.: • Prepare and Implement a Vegetation Restoration Plan that includes measures specific to peatland ecosystems and peatland restoration, including peat stockpile management: – Given the difficulty of restoring peatland environments and the overall size of the Construction Disturbance Area, if it's determined that restoration of all temporarily impacted peatland communities is not feasible, additional examination of the Construction Disturbance Area may be required to determine where peatland restoration efforts are required. Restoration techniques for peatland communities should follow established practices that have previously been shown to be successful in the establishment of appropriate ecological conditions including plant assemblages (in other words, the reestablishment of peat moss layers) and hydrology. Consideration should also be given to the type of community being restored. For example, the Moss Layer Transfer Technique is one method generally used for the reestablishment of bog and poor fen systems (Quinty et al., 2019). However, new methods or adjustments to existing techniques may be required for other peatland community types given the differences in species presence and hydrological conditions (in other words, best practices for bog restoration may not be applicable to fen community types) (Quinty et al., 2019).		

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Peatland Ecosystems**	• Road Usage • Maintenance	• Operation	• Changes to peatland ecosystem availability, distribution composition and function as a result of direct peatland loss	• Avoid re-entry and disturbance of restored temporary access areas post-construction. • Design and implement a program to monitor for peatland condition in the vicinity of project activities. The program will include science-based thresholds or indicators of peatland condition based on research and established standards, like those presented in Minasny et. al, 2023, as well as mitigation and adaptive response plan to prevent long term damage or carbon release. Details regarding the thresholds and indicators as well as the number of monitoring locations and the length of the monitoring period will be determined in subsequent Project phases.	• No residual effect anticipated	• No residual effect anticipated
• **Peatland Ecosystems**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Brush and timber disposal • Pits and quarries • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Changes to peatland ecosystems as a result of changes to hydrology	• A comprehensive list of mitigation measures to limit changes to surface water quantity and quality during construction and Operation is provided in the Surface Water Technical Support Document (**Appendix F**). • During detail design, carefully consider placement of culverts in peatland environments with a particular emphasis on the installation of culverts in areas where the road runs perpendicular to the natural flow of surface water; • Have Environmental Monitors and Indigenous Environmental Monitors onsite during construction to confirm that all mitigation measures are being implemented appropriately. Details regarding Environmental Monitors and their role during the project will be determined through the development of the Environmental Protection Plan; • Design and implement a pre-, during- and post-construction monitoring program that assesses surface water movement and helps maintain pre construction conditions to the extent feasible; and • Implement adaptive management measures if drainage patterns are determined to be significantly altered. Adaptive management measures will be determined through the development of the Environmental Protection Plan.	• Residual changes to peatland ecosystems due to changes to hydrology that may alter drainage patterns and increase or decrease drainage flows and surface water levels	• Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration / Reversibility: Long term • Frequency: Infrequent • Probability: Possible • Significance: Not Significant • Uncertainty: High • Direct / Indirect: Indirect
• **Peatland Ecosystems**	• Road Usage • Maintenance	• Operation	• Changes to peatland ecosystems as a result of changes to hydrology	• A list of mitigation measures to limit changes to surface water quantity and quality during construction and Operation is provided in the Surface Water Technical Support Document (**Appendix F**).	• Residual changes to peatland ecosystems due to changes to hydrology that may alter drainage patterns and increase or decrease drainage flows and surface water levels	• Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration / Reversibility: Long term • Frequency: Infrequent • Probability: Possible • Significance: Not Significant • Uncertainty: High • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Peatland Ecosystems**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Brush and timber disposal • Pits and quarries • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Changes to peatland ecosystems as a result of changes to groundwater	• A list of mitigation measures to limit changes to groundwater quantity and quality during construction is provided in the Groundwater Technical Support Document (**Appendix H**). • Construct the Community Access Road through peatland communities using a “floating road” construction methodology to allow for groundwater movement below and through the road embankment. This approach will involve: – Completion of a detailed ground survey, characterizing the peat and local hydrology at a later stage of the project / detail design. – Site-specific identification of appropriate values for peat strength. – Use of a geogrid base to act as a separator and strengthener between the road subgrade fill materials and the peat. – Use of additional geogrid and geotextile materials in layers combined with road aggregate material above the embankment fill to form a mechanically stabilized layer. This layer will provide the required strength and stiffness for the road to perform during all seasons, including spring thaw. – Design the Floating Road Plan, profile and cross-section for each road section based on context-sensitive design standards, geometry and loading. – Provide transitions between “floating road” sections, excavated, and fill sections. – Schedule construction to allow for primary settlement of the peat without risk of shear failure. – Monitor the work through construction, measuring and recording lateral movement and settlements. Be prepared to adjust the design based on observation and monitoring. • During detail design, carefully consider placement of culverts in peatland environments with a particular emphasis on the installation of culverts in areas where the road runs perpendicular to the natural flow of groundwater. This can help to minimize the impacts on local carbon and methane emissions and increased enzyme activity noted above (Saraswati and Strack, 2019; Saraswati et al., 2019; Saraswati et al., 2023). • Have Environmental Monitors and Indigenous Environmental Monitors onsite during construction to confirm that all mitigation measures are being implemented	• Residual changes to peatland ecosystems due to changes to groundwater that may alter drainage patterns, groundwater regimes, or groundwater quality. • Residual effects on the composition and function of retained peatlands	• Direction: Negative • Magnitude: Medium • Geographic Extent: Local • Duration / Reversibility: Long term • Frequency: Continuous • Probability: Probable • Significance: Significant • Uncertainty: High • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				appropriately. Details regarding Environmental Monitors and their role during the project will be determined through the development of the Environmental Protection Plan. • Design and implement a pre-, during- and post-construction monitoring program that assesses surface and groundwater movement and allows for the maintenance of preconstruction conditions to the extent feasible. This includes the creation of a monitoring program that involves geochemical testing on exposed bedrock and soils to assess the potential for acid rock drainage and / or metal leaching as it relates to methylmercury production in peatland communities present within the Construction Disturbance Area. The program will also monitor potential increases in methylmercury production related to changes in groundwater levels as a result of the construction of the Community Access Road. • Implement adaptive management measures if groundwater flow patterns are determined to be significantly altered. Adaptive management measures will be determined through the development of the Environmental Protection Plan.		
• **Peatland Ecosystems**	• Road Usage • Maintenance	• Operation	• Changes to peatland ecosystems as a result of changes to groundwater	• A list of mitigation measures to limit changes to groundwater quantity and quality during construction is provided in the Groundwater Technical Support Document (**Appendix H**).	• Residual effects on the composition and function of retained peatlands	• Direction: Negative • Magnitude: Medium • Geographic Extent: Local • Duration / Reversibility: Long term • Frequency: Continuous • Probability: Probable • Significance: Significant • Uncertainty: High • Direct / Indirect: Indirect
• **Peatland Ecosystems**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps(a) • Right-of-way clearing and grubbing • Brush and timber disposal • Pits and quarries • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching)	• Construction	• Changes to peatland ecosystems from the introduction and spread of invasive plant species	• An Environmental Protection Plan will be developed, and will be implemented during construction to prevent, detect, control (in other words, remove), and monitor areas with invasive species. The plan will also include the following measures: • Thoroughly inspect and clean construction equipment and vehicles prior to bringing them to the work area and when moving between work areas within the Project. Cleaning will be completed in accordance with the most up to date version of the Clean Equipment Protocol for Industry (Halloran et al., 2013). Documentation of the results of each inspection will be a requirement of the Environmental Protection Plan. Additional recommendations for the cleaning of equipment (for example, the use of specific	• Residual changes to peatland ecosystems as a result of the introduction and spread of invasive plant species • Residual effects on the composition and function of retained peatlands	• Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration / Reversibility: Long term • Frequency: Infrequent • Probability: Possible • Significance: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
	• Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas			cleaning stations and their location) will be determined through the development of the Environmental Protection Plan. • Use reduced disturbance techniques to prevent topsoil removal and preserve adequate substrate (for example, use a low impact method to leave the surface vegetation root mat intact). • Contour disturbed areas to minimize soil and water erosion and encourage growth of native vegetation. • Limit off-road vehicle use by owner/operator during construction. Inspections and maintenance activities will include cleaning of off-road vehicles before and after each use to prevent the spread of invasive species. Recommendations related to the use of off-road vehicles will be determined at detail design and / or through the development of the Environmental Protection Plan. • Use seed mixes with appropriate native species for all seeding and restoration works. Seed mixes must be tested / certified to be free of invasive species. Native seed should be sourced from local populations whenever possible. • Require that the road operator follow Ministry of Transportation Ontario Provincial Standard Specification 803 to avoid spreading invasive plant species. • Remove and manage invasive species using manual and mechanical means. Herbicides will not be used.		
• **Peatland Ecosystems**	• Road Usage • Maintenance	• Operation	• Changes to peatland ecosystems from the introduction and spread of invasive plant species	• Include the following measures as part of the Environmental Protection Plan to prevent, detect, control (in other words, remove), and monitor areas with invasive species: – Limit off-road vehicle use by owner / operator during Operation. Inspections and maintenance activities will include cleaning of off-road vehicles before and after each use to prevent the spread of invasive species. – Require that the road operator follows Ministry of Transportation Ontario Provincial Standard Specification 803 to avoid spreading invasive plant species. – Remove and manage invasive species using manual and mechanical means. Herbicides will not be used. – Design and implement a post-construction invasive species monitoring program to detect invasive species presence and control (in other words, remove) new introductions. Details of the post-construction invasive species monitoring program will be included in the Environmental Protection Plan.	• Residual changes to peatland ecosystems as a result of the introduction and spread of invasive plant species • Residual effects on the composition and function of retained peatlands	• Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration / Reversibility: Long term • Frequency: Infrequent • Probability: Possible • Significance: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Peatland Ecosystems**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Brush and timber disposal • Pits and quarries • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Changes to peatland ecosystems as a result of fragmentation and edge effects	• Adjust the alignment or clear off centre within the right-of-way to minimize peatland fragmentation and the creation of new forested swamp edges, where feasible. These details will be refined during detail design. • Construct temporary laydown areas and temporary construction camps on existing disturbed areas, wherever possible. The availability of existing disturbed areas for the construction of temporary laydown areas and temporary construction camps will be determined at detail design. • Avoid grubbing along newly created forested swamp edges to promote natural regeneration which will quickly “seal” the new forested swamp edge. • Use reduced disturbance techniques during construction to prevent topsoil removal, preserve adequate substrate (for example, use a low impact method to leave the surface vegetation root mat intact). Recommendations for reduced disturbance techniques will be described in detail design; and • Use progressive restoration onsite once temporary work areas (for example, staging areas) are no longer needed. Progressive restoration techniques will be provided in the Environmental Protection Plan.	• Residual changes to peatland ecosystems as a result of fragmentation and edge effects	• Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration / Reversibility: Medium term • Frequency: Frequent • Probability: Probable • Significance: Not Significant • Uncertainty: Moderate • Direct / Indirect: Indirect
• **Peatland Ecosystems**	• Road Usage • Maintenance	• Operation	• Changes to peatland ecosystems as a result of fragmentation and edge effects	• No additional mitigation measures are recommended during the Operation Phase.	• Residual changes to peatland ecosystems as a result of fragmentation and edge effects	• Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration / Reversibility: Medium term • Frequency: Frequent • Probability: Probable • Significance: Not Significant • Uncertainty: Moderate • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Peatland Ecosystems**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Brush and timber disposal • Pits and quarries • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Changes to peatland ecosystems from the release of sediment	• Develop and implement a Project-specific Environmental Protection Plan. • Develop and implement a Project-specific Erosion and Sediment Control Plan. Erosion and sediment control measures will be developed and implemented in accordance with Ontario Provincial Standard Specifications (Ministry of Transportation, 2021a, 2021b, 2021c). Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction. Installed erosion and sediment control measures are not expected to affect the water movement to peatlands. • Regularly inspect and maintain Erosion and Sediment Control structures (for example, sediment fences, rip rap, or other sediment control structures) in accordance with Ontario Provincial Standard Specifications (Ministry of Transportation, 2021a) during all phases of the Project and modify measures as necessary. If control measures are not functioning properly, no further work will occur until the problem is resolved. • Stabilize disturbed areas through revegetation with native plant species or other appropriate means (for example, erosion control blankets) following completion of the works. • Reschedule work or reduce / detour traffic in areas where soils are considered to be excessively wet or where there is a heavy rainfall risk. • Earthworks should be avoided during periods of heavy rainfall, particularly in areas adjacent to watercourses and wetlands. Areas where a reduction in traffic or detours are required are unknown at this design stage. • Adhere to all mitigation measures outlined in the Fish and Fish Habitat Technical Support Document (**Appendix G**) and the Surface Water Technical Support Document (**Appendix F**).	• No residual effect anticipated	• No residual effect anticipated
• **Peatland Ecosystems**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Brush and timber disposal • Pits and quarries	• Construction	• Changes to peatland ecosystems from spills of fuel or other contaminants	• Mitigation measures described in the Surface Water Technical Support Document (**Appendix F**), Groundwater Technical Support Document (**Appendix H**), Physiography, Terrain, and Soils Technical Support Document (**Appendix N**), and Vegetation Technical Support Document (**Appendix J**) will be implemented to minimize effects from spills of fuel and other contaminants to peatland ecosystems.	• No residual effect anticipated	• No residual effect anticipated

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
	• Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas					
• **Peatland Ecosystems**	• Road Usage • Maintenance	• Operation	• Changes to peatland ecosystems from spills of fuel or other contaminants	• During operations, mitigation measures will include a posting and enforcement of a speed limit on the highway, which should reduce potential for chemical or hazardous material spills by reducing vehicle collision risk. • A list of mitigation measures to limit the risk and effects from spills of fuel and other contaminants during Operation is provided in the Surface Water Technical Support Document (**Appendix F**), Groundwater Technical Support Document (**Appendix H**), Physiography, Terrain, and Soils Technical Support Document (**Appendix N**).	• No residual effect anticipated	• No residual effect anticipated
• **Peatland Ecosystems**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Brush and timber disposal • Pits and quarries(a) • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls)	• Construction	• Changes to peatland ecosystems as a result of the deposition of air contaminants	• A list of mitigation measures that will be implemented to limit air particulate emissions during construction is provided in the Atmospheric Environment Technical Support Document (**Appendix S**). The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management. • Environmental approval conditions, permits, or authorizations issued for the Project Construction, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction.	• Residual changes to peatland ecosystems as a result of the deposition of air contaminant	• Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration / Reversibility: Long term • Frequency: Continuous • Probability: Possible • Significance: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
	• Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas					
• **Peatland Ecosystems**	• Road Usage • Maintenance	• Operation	• Changes to peatland ecosystems as a result of the deposition of air contaminants	• A list of mitigation measures that will be implemented to limit air particulate emissions during Operation is provided in the Atmospheric Environment Technical Support Document (**Appendix S**). The effectiveness of mitigation measures will be evaluated during Operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.	• Residual changes to peatland ecosystems as a result of the deposition of air contaminants	• Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration / Reversibility: Long term • Frequency: Continuous • Probability: Possible • Significance: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect
• **Peatland Ecosystems**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Brush and timber disposal • Pits and quarries • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Changes to peatland ecosystems as a result of fugitive dust emissions	• A list of mitigation measures that will be implemented to limit dust deposition during construction is provided in the Atmospheric Environment Technical Support Document (**Appendix S**). These measures will be implemented to minimize effects from dust emissions and deposition on peatland ecosystems. The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management. • Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction.	• Residual changes to peatland ecosystems as a result of the fugitive dust emissions	• Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration / Reversibility: Long term • Frequency: Continuous • Probability: Certain • Significance: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Peatland Ecosystems**	• Road Usage • Maintenance	• Operation	• Changes to peatland ecosystems as a result of fugitive dust emissions	• A list of mitigation measures that will be implemented to limit dust deposition during Operation is provided in the Atmospheric Environment Technical Support Document (**Appendix S**). The effectiveness of mitigation measures will be evaluated during Operation, and mitigation measures will be modified or enhanced as necessary through adaptive management.	• Residual changes to peatland ecosystems as a result of the fugitive dust emissions	• Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration / Reversibility: Long term • Frequency: Continuous • Probability: Certain • Significance: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect
• **Peatland Ecosystems**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Brush and timber disposal • Pits and quarries • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Changes to peatland ecosystems as a result of increased public access	• Limit the Project footprint, vegetation clearing and access road requirements to the extent feasible (for example, share / coordinate access, concentrate temporary activities spatially, leave habitat outside the scoped Construction Disturbance Area, selective clearing, and use existing access roads when available). Reducing cleared areas and the number of access roads through coordination, can reduce the number of cleared areas and access roads that will be present during and following construction that may provide access to previously inaccessible lands; • Use progressive restoration onsite once temporary work areas (for example, staging areas) are no longer needed and prevent ongoing use of inactive areas through combined use of physical control measures (rollback, removal of creek crossings, recontouring to surrounding topography, revegetation / reforesting and / or barriers at junctions with active access); • Develop a policy for Project personnel while on shift or at temporary construction camps regarding any plant or timber harvesting activities; and • Develop a wildfire prevention plan for the construction works that outlines protocols for hot works or any other activity with the potential to trigger a fire, required fire suppression equipment, and a response plan if a fire is triggered.	• No residual effect anticipated	• No predicted residual effect
• **Peatland Ecosystems**	• Road Usage • Maintenance	• Operation	• Changes to peatland ecosystems as a result of increased public access	• Install access controls (for example, gates and boulders) to control public vehicle travel on some temporary access routes and trails. • Install signage at regular intervals stating that any dumping is prohibited.	• Residual changes to peatland ecosystems as a result of the fugitive dust emissions	• Residual changes to peatland ecosystems as a result of the fugitive dust emissions

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Peatland Ecosystems**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Brush and timber disposal • Pits and quarries • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Changes to peatland ecosystem carbon storage and flux	• To limit the disturbance and excavation of peat, a “floating road” construction methodology will be utilized where the proposed Community Access Road will be constructed on top of the peat. • Limit vegetation clearing to within the 100 metre right-of-way and reduce to less than this width whenever and wherever possible. – Minimize clearing widths in peatland ecosystems given the difficulty of restoration efforts in these systems. – Adjust the alignment or clear off centre within the right-of-way where warranted, to minimize effects on peatland ecosystems. These details will be refined during detail design, prior to construction. – Limit clearing of riparian vegetation (in other words, within 30 metre of waterbodies) to the extent possible and to the requirement of the access road and alignment clearing width only. – Locate temporary access roads, staging areas, camps, and debris and / or timber stockpiles in less sensitive ecosystems (for example, upland ecosystems), where possible. Avoid peatland communities for temporary features wherever possible. • Decommission and rehabilitate temporary access roads, staging areas, camps, and debris and / or timber stockpiles following construction. Details related to peatland rehabilitation will be determined at detail design and / or when the Vegetation Restoration Plan is developed. • Prepare and Implement a Vegetation Restoration Plan that includes measures specific to peatland communities and peatland restoration, including peat stockpile management. These measures will be determined at detail design and / or when the Vegetation Restoration Plan is developed. This plan will be developed through engagement and consultation with Indigenous communities and integration of local Indigenous Knowledge and stewardship protocols.	• Residual changes to peatland ecosystems as a result of the fugitive dust emissions	• Residual changes to peatland ecosystems as a result of the fugitive dust emissions

9.3.6 Assessment of Significance of Water Disciplines

The assessment of significance of residual effects of the Community Access Road is informed by the interaction between the significance factors, with magnitude and geographic extent being the most important factors. Consideration is also given to context, which includes ecological context (in other words, the sensitivity and resilience of the valued components), and social context (in other words, concerns of Indigenous communities, interested agencies, groups and individuals raised during consultation and engagement and through review comments on the Environmental Assessment reports). Implementation of proven mitigation measures is expected to aid in the avoidance or reduction of the magnitude, geographic extent, and / or duration of residual effects on surface water, fish and fish habitat, groundwater and geochemistry, and peatlands.

9.3.6.1 Surface Water

The magnitude of the predicted residual effects on surface water and sediment features are negligible in magnitude, range from short-term to long-term in duration, and range from confined to the Construction Disturbance Area to Local Study Area in geographic extent.

Residual effects on the surface water and sediment valued component were considered not significant as the residual effects were assessed negligible in magnitude, and they do not represent a substantial management concern. There is the potential for management concerns through an increased use of public access leading to changes in navigable waterways; however, the resources are expected to continue to be managed through Ministry of Natural Resources and local communities for recreational activities, respectively. The residual effects were predicted to be in accordance with federal and provincial guidelines.

Overall, the predicted residual effects on surface water were assessed as not significant because the predicted residual effects on surface water were not anticipated to result in a change beyond a manageable level.

9.3.6.2 Fish and Fish Habitat

The magnitude of the predicted residual effects on fish and fish habitat during construction and operations of the Community Access Road are of negligible to medium magnitude and range from confined to the Construction Disturbance Area to regional in geographic extent.

Residual effects on the fish valued component were considered not significant as the residual effects were assessed negligible to medium in magnitude and they do not represent a substantial management concern. There is the potential for management concerns through an increased public access leading to changes in angler pressure and fish harvest; however, the resources are expected to continue to be managed through the Ministry of Natural Resources and local communities for recreational and Indigenous harvest, respectively. Residual effects on aquatic biodiversity were also considered not significant.

Overall, the valued component fish populations are expected to remain self-sustaining and ecologically effective; therefore, the predicted residual effects on fish and fish habitat are assessed as not significant.

9.3.6.3 Groundwater and Geochemistry

The magnitude of the predicted residual effects on groundwater are medium to high in magnitude, range from medium-term to long-term in duration, are reversible and irreversible, and are confined to the Local Study Area in geographic extent.

Residual effects on the groundwater valued component were considered not significant as none of the residual effects were assessed as high in magnitude, long-term or permanent duration, irreversible, and at any geographic extent and they do not represent a substantial management concern. The residual effects were predicted to be in accordance with federal and provincial guidelines.

Overall, the predicted residual effects on groundwater were assessed as not significant because the predicted residual effects on groundwater were not anticipated to result in a change beyond a manageable level.

9.3.6.4 Peatlands

The magnitude of the predicted residual effects on peatlands is either negligible, low or medium and the extent ranges from being confined to the Construction Disturbance Area to local (such as, the effects assessment Local Study Area). Based on these and other ratings, in each case the residual effects are considered not significant because they are not expected to compromise the long-term viability of peatland ecosystems.

A high uncertainty rating has been assigned to two of the residual effects (in other words, residual changes to peatland ecosystems due to changes in groundwater that may alter drainage patterns, groundwater regimes, or groundwater quality and residual changes to peatland ecosystems due to changes in hydrology that may alter drainage patterns and increase or decrease drainage flows and surface water levels). The

uncertainty related to these effects is in regards to the lack of a full understanding of peatland hydrology and hydrogeology in the effects assessment Local and Regional Study Areas, as well as uncertainty regarding the preliminary design details and effectiveness of the primary design-related mitigation measure (in other words, the "floating road") (**Appendix W**). Given the high uncertainty and probable likelihood of occurrence (versus the possible likelihood of occurrence for the residual effects to hydrology), a precautionary approach has been taken and the residual effects associated with groundwater (quantity and quality) are determined to be significant at this time. There are commitments to address gaps in knowledge during future stages of the project (**Section 14; Appendix AA**), thereby reducing the high uncertainty that has been conservatively assigned in this assessment. With an improved understanding of peatland hydrology and hydrogeology in the study areas and associated refined road design within peatlands that will be developed during future stages of the project, there are assurances that the uncertainty associated with the two residual effects will be lessened and peatland ecosystems will continue to be self-sustaining and ecologically effective.

Based on the weight of evidence from the analysis, uncertainty in effects predictions, specifically those associated with the "floating road" approach to construction and operation, and application of the precautionary approach, Project-related changes in the availability, distribution, composition, and function of peatland ecosystems could occur. Specifically, those changes to peatland ecosystems associated with groundwater quantity and quality were assessed as significant. As a result, the combined residual effects from the Project on peatland ecosystems are predicted to be significant.

9.4 Land

> "…the relationship Anishinabek have with the land cannot be captured by the simplified notion of being 'close to nature'. The land is not just seen as shaping or influencing identity but being an actual part of it." (Wilson, 2003)

9.4.1 Spatial Boundaries of Land Disciplines

As part of the effects assessment exercise, disciplines revised their study areas based on the development of the Preferred Route. The updated study areas for vegetation, wildlife, birds, ungulates, physiograph, terrain and soils are show on **Figure 9.4-1** to **Figure 9.4-5**.

Figure 9.4-1: Vegetation Effects Assessment Local and Regional Study Area

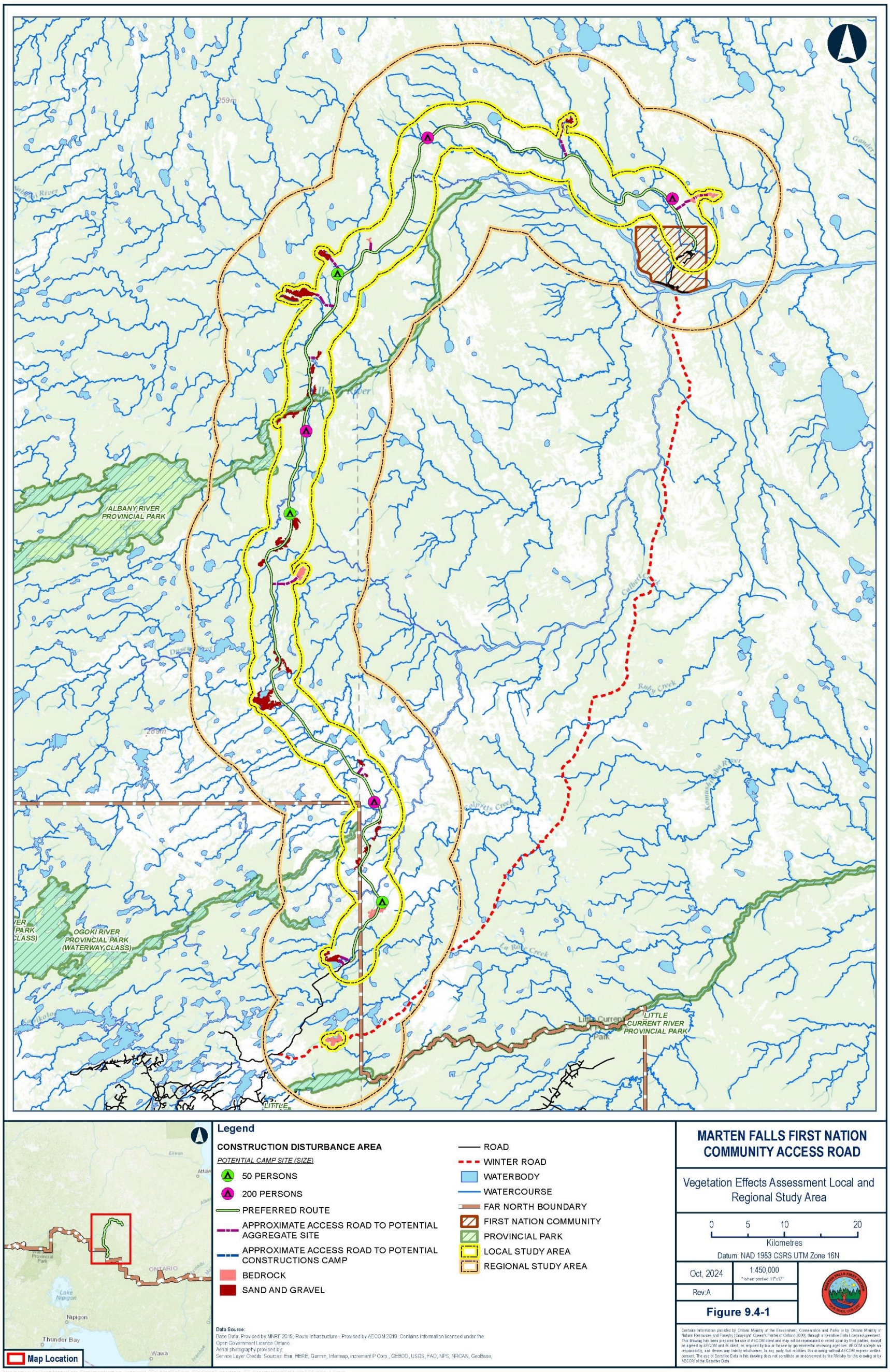


Figure 9.4-2: Wildlife Effects Assessment Local and Regional Study Area

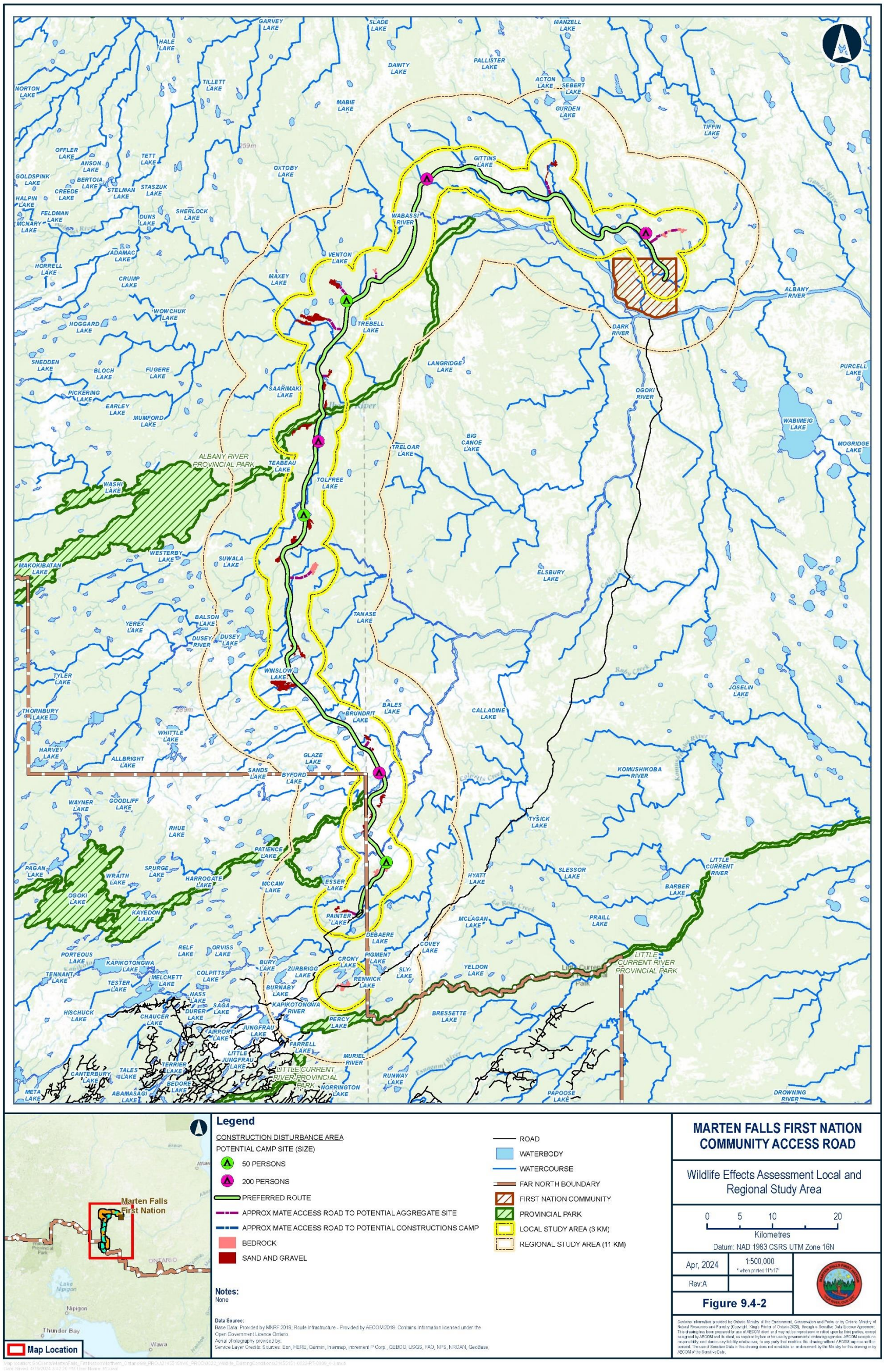


Figure 9.4-3: Birds Effects Assessment Local and Regional Study Area

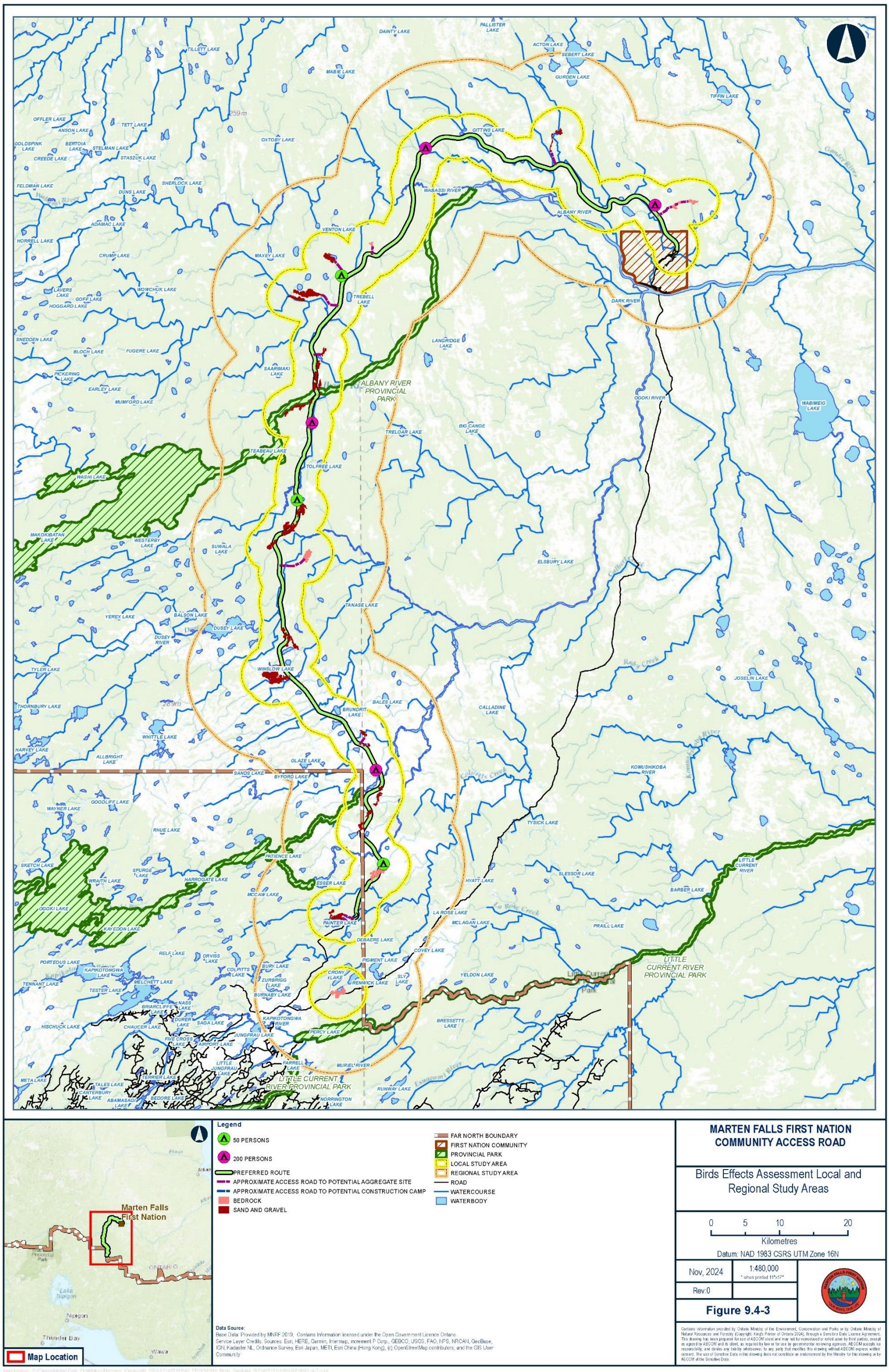


Figure 9.4-4: Ungulates Effects Assessment Local Study Area, Caribou and Moose Regional Study Areas

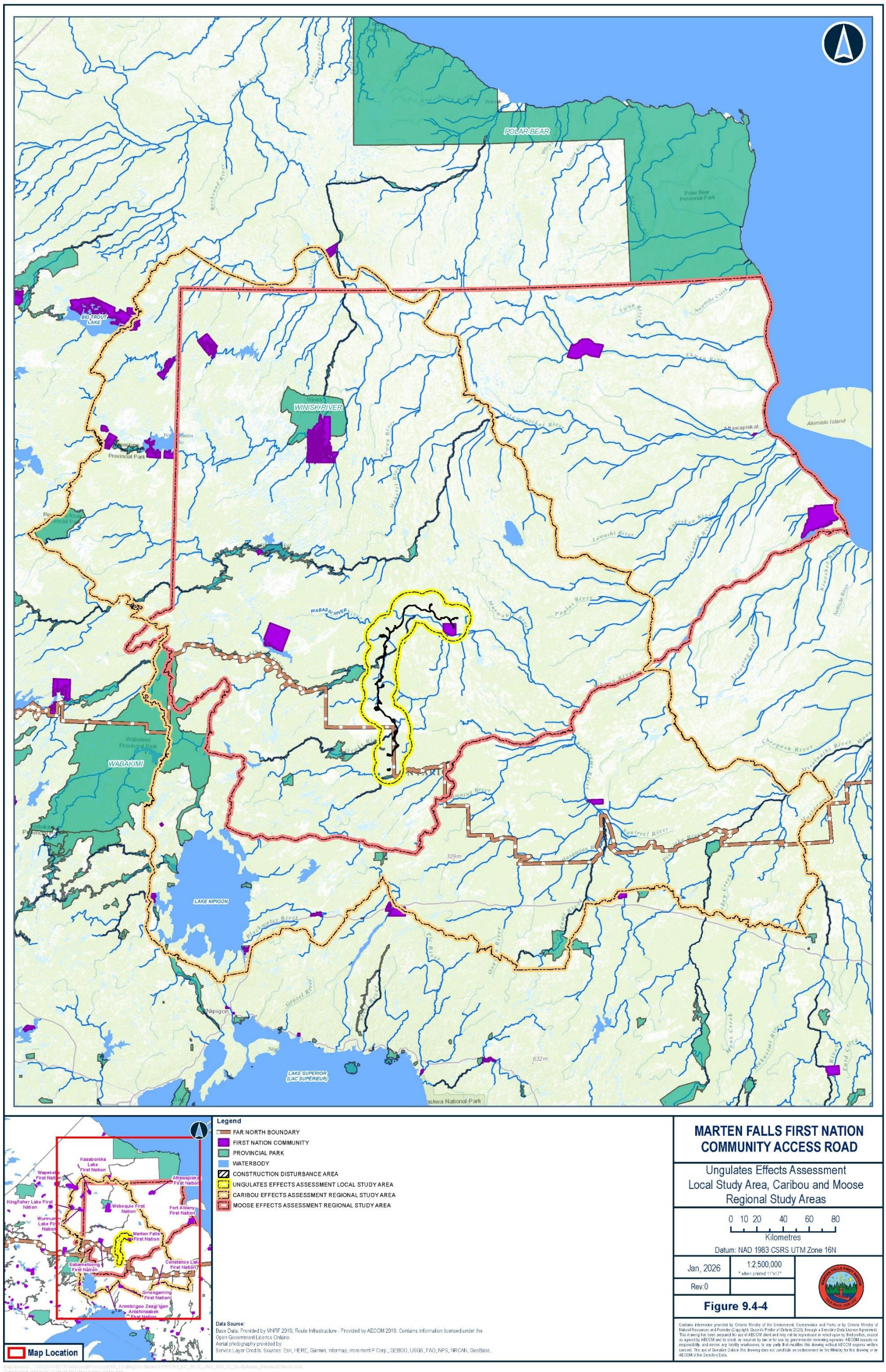
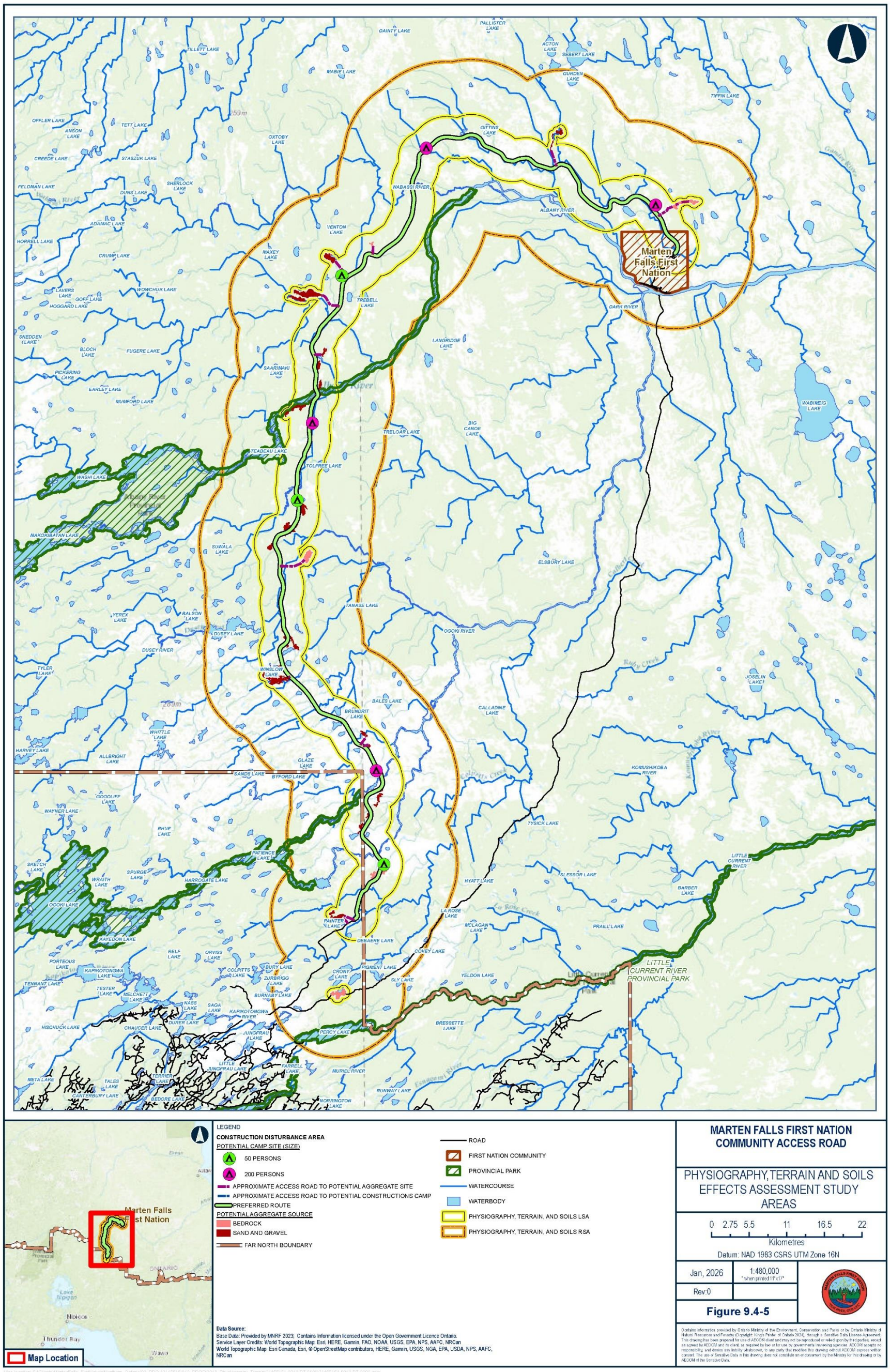


Figure 9.4-5: Physiography, Terrain and Soils Effects Assessment Study Areas



9.4.2 Vegetation

9.4.2.1 Project-Environment Interactions

As a component of the effects assessment, the Project activities were reviewed to find potential environmental interactions. These interactions were then assessed for potential effect (**Table 9.4-1**).

Table 9.4-1: Project-Environment Interactions – Vegetation

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• **Construction**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Brush and timber disposal • Pits and quarries • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the Aggregate Resource Act • Decommissioning of temporary camps, roads / trails and staging areas	• All Vegetation Valued Components	• Availability • Distribution	• Changes to the availability and distribution of vegetation valued components as a result of direct vegetation loss
• **Construction**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Brush and timber disposal • Pits and quarries • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the Aggregate Resource Act • Decommissioning of temporary camps, roads / trails and staging areas	• All Vegetation Valued Components	• Composition and Function	• Changes to the composition and function of vegetation valued components as a result of direct vegetation loss • Changes to vegetation valued components as a result of changes to hydrology (for example, alteration of drainage patterns and increased / decreased drainage flows and surface levels that can cause changes to soils and vegetation health / composition thereby changing the availability, distribution, composition, and function of retained vegetation communities) • Changes to vegetation valued components as a result of changes to groundwater (for example, alteration of drainage patterns and increased / decreased drainage flows and groundwater levels that can cause changes to soils and vegetation health / composition thereby changing the availability, distribution, composition, and function of retained vegetation communities) • Changes to vegetation valued components resulting from the introduction and spread of invasive plant species (for example, Phragmites) • Changes to vegetation valued components as a result of fragmentation and edge effects (for example, clearing within an otherwise intact landscape introduces a range of edge effects on retained vegetation communities including sunscald and windthrow) • Changes to vegetation valued components from the release of sediment during construction • Changes to vegetation valued components from spills of fuel or other contaminants • Changes to vegetation valued components as a result of the deposition of air contaminants during construction • Changes to vegetation valued components as a result of fugitive dust emissions during construction • Changes to vegetation community composition and function resulting from increased public access

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• **Operations**	• Road usage • Maintenance	• All Vegetation Valued Components	• Availability • Distribution	• Changes to the availability and distribution of vegetation valued components as a result of additional vegetation clearing required for maintenance activities
• **Operations**	• Road usage • Maintenance	• All Vegetation Valued Components	• Composition and Function	• Changes to vegetation valued components as a result of changes to hydrology (for example, alteration of drainage patterns and increased / decreased drainage flows and surface levels that can cause changes to soils and vegetation health / composition thereby changing the availability, distribution, composition, and function of retained vegetation communities) • Changes to vegetation valued components as a result of changes to groundwater (for example, alteration of drainage patterns and increased / decreased drainage flows and groundwater levels that can cause changes to soils and vegetation health / composition thereby changing the availability, distribution, composition, and function of retained vegetation communities) • Changes to vegetation valued components from spills of fuel or other contaminants • Changes to vegetation valued components from the release of sediment • Changes to vegetation valued components as a result of the deposition of air contaminants from road usage • Changes to vegetation valued components as a result of fugitive dust emissions from road usage • Changes to vegetation valued components resulting from the introduction and spread of invasive plant species (for example, Phragmites) from road usage • Changes to vegetation community composition and function resulting from increased public access

9.4.2.2 Discipline-Specific Characteristics

In support of the residual effects characteristics described in **Section 6.7.3**, **Table 6-1**, the following vegetation definitions apply to the effects assessment.

Ecological and Social Context

Ecological context for vegetation valued components considers plant species or ecosystem sensitivity and resilience, current status and trends, and applicable legislation and best management practices. The current and future sensitivity and resilience of vegetation valued components to change caused by the Community Access Road are considered and includes Indigenous Knowledge, where available. Context also informs whether the residual effect would alter the ability of the vegetation valued component population or ecosystem to be self-sustaining and ecologically effective (in other words, the determination of significance). Ecological context is discussed in a reasoned narrative with other characteristics such as magnitude, geographic extent, duration, reversibility, and probability of occurrence used to characterize residual effects and determine significance.

Magnitude

For magnitude, environmental discipline-specific descriptions are required and are provided in **Table 9.4-2**. Magnitude of effects are project-related and exclude variations due to climate change.

Table 9.4-2: Vegetation Magnitude Descriptions

Magnitude Level	Description	Rationale
• **Negligible**	• Limited to no variation predicted in the measurement indicators for vegetation valued components	• Changes to ecosystems or populations are minor and largely indiscernible; therefore, no effect on ecosystem or population resilience.
• **Low**	• A small variation predicted in the measurement indicators for vegetation valued components	• Minor incremental effects on ecosystems or populations are anticipated to be discernible but remain within the limits of ecosystem or population resilience.
• **Medium**	• A moderate variation predicted in the measurement indicators for vegetation valued components	• Incremental effects on ecosystems or populations are anticipated to be measurable but is inferred to remain within the limits of ecosystem or population resilience.
• **High**	• A large variation predicted in the measurement indicators for vegetation valued components	• Effects on ecosystems or populations are anticipated to be severe and likely to impair ecosystem or population resilience.

9.4.2.3 Residual Effects – Construction Phase

9.4.2.3.1 Changes to the Availability and Distribution of Vegetation Valued Components as a result of Direct Vegetation Loss

9.4.2.3.1.1 Potential Effects

Upland, Wetland and Riparian Ecosystems

Clearing of vegetation for all construction-related activities will result in the direct loss of vegetation communities (including upland, wetland, and riparian ecosystems), thereby reducing the availability of these communities within the effects assessment Local and Regional Study Areas as well as changing their distribution within the Project landscape. As a conservative estimate, it is assumed that that the entire effects assessment Construction Disturbance Area will be cleared, resulting in the following direct loss of vegetation (**Table 9.4-3** through **Table 9.4-5**):

- **2,309.3 hectares Upland Ecosystems**, which equates to **2 percent** of the Upland Ecosystems within the effects assessment Regional Study Area;
- **2,363.2 hectares Wetland Ecosystems**, which equates to **1 percent** of the Wetland Ecosystems within the effects assessment Regional Study Area; and
- **116.7 hectares Riparian Ecosystems**, which equates to **1 percent** of the Riparian Ecosystems within the Effects Assessment Regional Study Area.

Table 9.4-3: Summary of Upland Ecosystem Loss in the Effects Regional Study Area

Upland Community	Construction Disturbance Area (hectares)	Percent of Community Type within the Effects Regional Study Area Affected
Coniferous Forest	1,620.6	3%
Deciduous Forest	601.1	6%
Mixed Forest	73.9	0%
Rock / Barren	8.3	6%
Early Successional / Sparse Treed	5.5	0%
Total	**2,309.3**	**2%**

Table 9.4-4: Summary of Wetland Ecosystem Loss in the Effects Regional Study Area

Wetland Community	Construction Disturbance Area (hectares)	Percent of Community Type within the Effects Regional Study Area Affected
Swamp	1,510.5	1%
Marsh	37.4	2%
Fen	786.2	1%
Bog	29.2	0%
Total	**2,363.2**	**1%**

Table 9.4-5: Summary of Riparian Ecosystem Loss in the Effects Regional Study Area

Vegetation Community Grouping	Construction Disturbance Area (hectares)	Percent of Community Type within Riparian Ecosystems of the Effects Regional Study Area Affected
Coniferous Forest	24.3	1%
Deciduous Forest	5.2	1%
Mixed Forest	1.0	0%
Rock / Barren	0.3	2%
Early Successional / Sparse Treed	0.2	0%
Fen	16.4	1%
Bog	0.0	0%
Marsh	24.1	2%
Swamp	32.0	1%
Anthropogenic	0.3	3%
Water	13.0	0%
Total	**116.7**	**1%**

Most of these direct losses are expected to be permanent (and are assumed to be permanent in direct loss calculation) because operations is predicted to be indefinite. However, the effects assessment Construction Disturbance Area footprint includes temporary features (for example, temporary access roads, storage and temporary laydown areas, temporary construction camps, and temporary pits and quarries). Some of which may be decommissioned and restored or vegetation will be established, as outlined on the required Rehabilitation Plan to align with the 'Aggregate Resources of Ontario: Site Plan (2020) Standards' (**Table 9.4-6**).

Restoration activities would support the establishment and succession of vegetation communities with similar function to existing conditions ecosystems. These areas are anticipated to eventually provide some of the functions that the cleared vegetation communities currently provide; however, the reestablishment of certain vegetation community types (for example, peatlands) is challenging. Further discussion on the

reestablishment of peatland communities is provided in the Peatlands Technical Support Document (**Appendix I**).

Table 9.4-6: Summary of Permanent and Temporary Features within the Construction Disturbance Area

	Permanent Footprint	Temporary Footprint
• **Description of Footprint Area**	• 60 metres of the 100 metre wide right-of-way • Assume 30 metres on either side of the centreline	• The outer 20 metres on either side of the 60 metre permanent right-of-way (in other words, outside of the 60 metre permanent right-of-way)
• **Features**	• Nine of 18 aggregate and quarry sites, as well as the associated 10-metre wide access roads, will remain open for maintenance.	• Nine of 18 aggregate and quarry sites, as well as the associated 10-metre wide access roads, will be closed after construction and are opportunities for future restoration. • Camps, laydown areas, fly yards (all construction based areas)

Designated Areas

Provincial Parks

Clearing of vegetation for all construction-related activities will result in the direct loss of Designated Areas (in other words, Provincial Parks and Critical Landform / Vegetation Associations), thereby reducing the availability of Designated Areas within the effects assessment Local and Regional Study Areas as well as marginally affecting their distribution within the Project landscape. As a conservative estimate, it is assumed that the entire Construction Disturbance Area will be cleared. Two of the Provincial Parks (in other words, Little Current River and Ogoki River) will not be directly affected by the Project. Only the Albany River Provincial Park will experience direct effects through vegetation removal.

- 5.7 hectares of the Albany River Provincial Park will be affected by the clearing of the Construction Disturbance Area. This represents <1 percent of the total Provincial Park area and <1 percent of the Provincial Park that occurs within the effects assessment Regional Study Area.

Critical Landform / Vegetation Associations

Clearing of vegetation for all construction-related activities will also result in the direct loss of some Critical Landform / Vegetation associations within protected areas and proposed protected areas, thereby reducing the availability of these communities within the effects assessment Local and Regional Study Areas as well as changing their distribution within

the Project landscape. As a conservative estimate, it is assumed that that the entire Construction Disturbance Area will be cleared, resulting in the following direct loss of Critical Landform / Vegetation associations.

- 491.2 hectares of Critical Landform / Vegetation associations will be affected by the Construction Disturbance Area, which represents 1 percent of the Critical Landform / Vegetation associations within the effects assessment Regional Study Area. The six Landform / Vegetation associations with the greatest impacts (in other words, 458.8 hectares or 93 percent of the 491.2 hectares affected) are:
  - Fine Ground Moraine – Disturbance – Treed and / or Shrub: 86.2 hectares.
  - Organic Deposits – Coniferous Swamp: 186.5 hectares.
  - Organic Deposits – Disturbance – Non and Sparse Woody: 71.5 hectares.
  - Organic Deposits - Treed Fen: 81.5 hectares.
  - Precambrian Int. to Acidic Bedrock – Treed Fen: 22.9 hectares.
  - Organic Deposits – Thicket Swamp: 10.2 hectares.

The remaining 32.4 hectares of Critical Landform / Vegetation associations that are affected include ten Critical Landform / Vegetation associations. Loss of Critical Landform / Vegetation associations reduces their contribution to the protection of Ontario's biodiversity.

Traditional Use Plant Habitat Availability

Suitable and accessible habitat for Traditional Use Plant species is available throughout the effects assessment Local Study Area. There is an apparent increase in the presence of ecosites with a higher score in the central, and north portion of the effects assessment Local Study Area, however it does not appear that clearing of vegetation within the Construction Disturbance Area will disproportionally affect the ecosites with a high score.

Species at Risk and Species of Conservation Concern

Black Ash

Approximately 35,390.2 hectares, representing 31 percent of the effects assessment Local Study Area has been assessed as suitable habitat for Black Ash. Clearing of vegetation within the Construction Disturbance Area will remove approximately 1,643.5 hectares of this area, representing 5 percent of the suitable habitat within the effects assessment Local Study Area. While this is moderately large area of potential loss of suitable Black Ash habitat, it must be recognized that the Project is at the northern limit of the known range for Black Ash (Catling et al., 2022); therefore, the affected suitable

habitat represents both current and future suitable habitat (in other words, range expansion resulting from climate change). Observations of Black Ash during the 2021-2023 vegetation field program were limited to seven locations near the south end of the effects assessment Local Study Area (in other words, along the Ogoki River). One known location of Black Ash is within the Construction Disturbance Area. There is good potential that Black Ash is found in other locations within the Construction Disturbance Area.

Black Ash trees located in the Project landscape are not currently protected under 9 (1) (a) of the *Endangered Species Act* (such as, kill, harm, harass, capture or take a living member an endangered or threatened species), since they are not located within a municipality or territorial district described in Schedule 1 of Ontario Regulation 6/24. However, given the length of time the Project will take to reach completion, and that predicted climate warming may bring Emerald Ash Borer further north, Black Ash are discussed in the context of Species at Risk as regulations related to habitat protection may be amended to include some or all of the effects assessment Local Study Area and / or effects assessment Regional Study Area during future Project phases.

Northern Marsh Violet

Approximately 82,052.1 hectares, representing 71 percent of the effects assessment Local Study Area has been assessed as suitable habitat for Northern Marsh Violet. Clearing of vegetation within the Construction Disturbance Area will remove approximately 2,404.1 hectares of this area, representing 3 percent of the suitable habitat within the Effects Assessment Location Study Area. Northern Marsh Violet was not observed during the 2021-2023 field program therefore direct impacts to individuals are unknown.

Northern Marsh Violet is a provincially rare plant species ranked S2S3 in Ontario (in other words, a Species of Conservation Concern). It is a species that is tracked by the province but is not a Species at Risk afforded legal protection under the *Endangered Species Act* or *Species at Risk Act*.

9.4.2.3.1.2 Mitigation and Enhancement Measures

Mitigation measures that will be implemented during construction to minimize direct vegetation loss wherever and whenever possible are outlined below. These measures are generally applicable to all vegetation valued components.

- Limit vegetation clearing to within the 100 metre right-of-way and reduce to less than this width to the extent possible;
  - Minimize clearing widths in more sensitive ecosystems (for example, riparian ecosystems) and more difficult to restore vegetation community groups (for example, fen and bog) to the extent possible.

  - Adjust the alignment or clear off centre within the right-of-way where warranted, to minimize effects on more sensitive or difficult to restore vegetation communities. These details will be refined during detail design, prior to construction.
  - Limit clearing of riparian vegetation (in other words, within 30 metres of waterbodies) to the extent possible and to the requirement of the access road and alignment clearing width only.
  - Locate temporary access roads, staging areas, camps, and debris and / or timber stockpiles in less sensitive ecosystems (for example, upland ecosystems), where possible. Avoid peatland communities for temporary features wherever feasible.

- Upon completion of construction, sand and gravel pits, including temporary access roads leading to the pits will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the Aggregate Resource Act, which will include backfilling, levelling, recompacting, and redistributing organic materials. Temporary access roads leading to temporary quarry areas will also be decommissioned. Temporary quarries not required for maintenance activities will be vegetated in accordance with the Rehabilitation Plan. Quarries maintained for operations will be blocked to discourage public use but facilitate access for ongoing road maintenance;
- Perform clearing and construction activities in winter months where feasible;
- Develop and implement a Project-specific Environmental Protection Plan;
- Have Environmental Monitors and Indigenous Environmental Monitors onsite during construction to confirm that all mitigation measures are being implemented appropriately. Details regarding Environmental Monitors and their role during the Project will be determined through the development of the Environmental Protection Plan;
- Reassess the status of Black Ash protection during future study phases. If Schedule 1 of Ontario Regulation 6/24 has been updated to include the area of the Project, a search for Black Ash trees will be completed at the Ogoki River crossing. Other suitable habitat in the south portion of the effects assessment Construction Disturbance Area may also need to be searched. The scope of this additional assessment will be determined in consultation with regulatory agencies. If Black Ash trees are anticipated to be affected by the Project, regulatory agencies (Ministry of the Environment, Conservation and Parks, Environment Canada and Climate Change) will be consulted on next steps;

- Prepare and implement a Vegetation Management Plan at detail design that contains measures to protect rare plants, including protocols specific to Black Ash (for example commitments to Emerald Ash Borer prevention measures and long-term surveillance). In the event a rare plant species is encountered unexpectedly, or cannot be avoided, the rare plant protection measures outlined in the Vegetation Management Plan will be implemented;
- Consult with Ontario Parks at detail design to determine permitting, mitigation and / or compensation / offsetting expectations for direct impacts to the Albany River Provincial Park;
- Consult with Ontario Parks at detail design to determine permitting, mitigation and / or compensation / offsetting expectations for impacts to Critical Landform / Vegetation Associations;
- Locate temporary access roads, staging areas, camps, and debris and / or timber stockpiles away from known Traditional Use Plant harvesting areas, where possible;
- Prepare and Implement a Vegetation Restoration Plan. This plan will be developed through engagement and consultation with Indigenous communities and integration of local Indigenous Knowledge and stewardship protocols; and
- Include the seeding and / or planting of Traditional Use Plants in the Vegetation Restoration Plan.

9.4.2.3.1.3 Predicted Residual Effects

Measures to minimize direct impacts to vegetation valued components will be implemented, but direct losses cannot be avoided, therefore changes to the availability and distribution of vegetation valued components as a result of direct vegetation loss during construction is predicted to result in a residual effect and this interaction is carried forward to the residual effects characterization.

9.4.2.3.2 Changes to the Availability and Distribution of Vegetation Valued Components as a result of Direct Vegetation Loss

9.4.2.3.2.1 Potential Effects

Upland, Wetland and Riparian Ecosystems

The removal of vegetation reduces habitat availability (in other words, through direct loss of habitat) and can alter habitat suitability (for example, by disrupting habitat connectivity) for wildlife and vegetation species. This can result in a decline in biodiversity. A more detailed discussion of potential effects on wildlife habitat are

discussed in the Wildlife Technical Support Document Report (**Appendix K**), Birds Technical Support Document (**Appendix L**) and Ungulates Technical Support Document (**Appendix M**).

In addition to the above, vegetation clearing in Riparian Ecosystems can reduce the stabilizing forces provided by plant roots, reduce physical obstructions provided by plant material that moderate surface water run-off velocity, and also expose vulnerable banks or slopes resulting in increased erosion and sedimentation. Disturbance of soils can contribute to sedimentation by increasing the quantity of loose material present. Soil disturbance during vegetation removal can also facilitate the spread of invasive species. Loss of vegetation cover might also increase the water temperature due to a reduction in shading, which can reduce aquatic species richness and alter habitat suitability for fish. A more detailed discussion of potential effects on fish and fish habitat are discussed in the Fish and Fish Habitat Technical Support Document (**Appendix G**).

Clearing of vegetation for all construction-related activities will also result in the direct loss of functional area from vegetation communities (including Upland, Wetland, and Riparian Ecosystems) and might reduce the ability of remaining areas to carry out important ecosystem functions. For example, construction on areas that were previously swamp or fen might reduce surface water flows into unaffected areas, causing the water table to drop and conditions to become unsuitable for species adapted to saturated soils. This, in turn, could result in increased abundance of upland species, a reduction in biodiversity, a decline in peat production and an accompanying reduction in carbon sequestration capacity (Borkenhagen et al., 2023). Changes to the composition of vegetation communities has been noted as a concern by Indigenous communities who have provided feedback on the Project including Weenusk First Nation (MNP LPP, 2024b). Vegetation loss also reduces the capacity of ecosystems to conduct biogeochemical functions such as photosynthesis and the uptake and processing of nutrients.

9.4.2.3.2.2 Mitigation and Enhancement Measures

Mitigation measures that will be implemented during construction to minimize direct vegetation loss wherever and whenever possible are outlined in **Section 9.4.2.3.1.**

9.4.2.3.2.3 Predicted Residual Effects

Measures to minimize direct impacts to Upland, Wetland, and Riparian Ecosystems will be implemented but direct losses cannot be avoided during construction. Therefore, changes to the composition and function of Upland, Wetland, and Riparian Ecosystems as a result of direct vegetation loss during construction is predicted to result in a residual effect and this interaction is carried forward to the residual effects characterization.

Upland, Wetland and Riparian Ecosystems

Changes to Upland, Wetland and Riparian Ecosystems are predicted to be small, but discernible and therefore **low** in magnitude. Further, Wetland and Riparian Ecosystems are not rare in this landscape and no net loss of function of these ecosystems are anticipated. However, it is noteworthy that the percentage of each ecosystem affected is based on a total of all vegetation community types in each ecosystem type. If the vegetation community effects are examined in more detail, there are some upland community types that are affected to a greater degree. For example, 6 percent of the Deciduous Forest communities within the effects assessment Regional Study Area will be lost. These upland vegetation communities are uncommon in the effects assessment Regional Study Area and will experience a disproportionate loss. After implementation of the mitigation measures, the effects from direct vegetation loss will mostly be **permanent** (irreversible), as most of the Construction Disturbance Area will remain disturbed in perpetuity; however, some temporary work areas will be restored or will revegetate naturally. Where the effects are permanent, the effect of direct vegetation loss is **long-term**. Where reclamation of temporary work areas occurs, and for vegetation community types where restoration is possible, the effect is **medium-term**. The effects are **certain** to occur, and the changes are **negative**; however as noted above, the magnitude is considered **low**. As a result, the residual effects as a result of direct vegetation loss on Upland, Wetland and Riparian Ecosystems are determined to be not significant.

Designated Areas

After implementation of the mitigation measures, the effects from direct vegetation loss will mostly be permanent (irreversible), as most of the Construction Disturbance Area will remain disturbed in perpetuity; however, some temporary work areas will be restored or will revegetate naturally. Where the effects are permanent, the effect of direct vegetation loss is long-term. Where reclamation of temporary work areas occurs, and for vegetation community types where restoration is possible, the effect is medium-term. The effects are certain to occur, and the changes are negative; however, the magnitude is considered low as the percentage of the Provincial Park and Critical Landform / Vegetation Associations affected within the effects assessment Regional Study Area (in other words, <1 percent and 1 percent respectively) is small, but discernible. As a result, the residual effects as a result of direct vegetation loss on Designated Areas are determined to be not significant.

Traditional Use Plants

After implementation of the mitigation measures, the effects from direct vegetation loss will mostly be permanent (irreversible), as most of the Construction Disturbance Area

will remain disturbed in perpetuity; however, some temporary work areas will be restored or will revegetate naturally and will likely support populations of Traditional Use Plants. Where the effects are permanent, the effect of direct vegetation loss is long-term. Where reclamation of temporary work areas occurs, and for vegetation community types where restoration is possible, the effect is medium-term. The effects are certain to occur, and the changes are negative; however, the magnitude is considered low as changes to habitat availability within the effects assessment Local Study Area are small (in other words, 4 percent), and is likely to have small but discernible effects on the regional populations of Traditional Use Plants given the small anticipated loss of habitat relative to what is available in the remainder of the effects assessment Local Study Area. Further, vegetation clearing is not expected to disproportionally affect high scoring ecosites. Although not mapped for the Project, it is anticipated that additional suitable habitat for Traditional Use Plants is also available throughout the effects assessment Regional Study Area. As a result, the residual effects as a result of direct vegetation loss on habitat for Traditional Use Plants are determined to be not significant.

Species at Risk and Species of Conservation Concern

After implementation of the mitigation measures, the effects from direct vegetation loss will mostly be permanent (irreversible), as most of the Construction Disturbance Area will remain disturbed in perpetuity; however, some temporary work areas will be restored or will revegetate naturally. Where the effects are permanent, the effect of direct vegetation loss is long-term. Where reclamation of temporary work areas occurs, and for vegetation community types where restoration is possible, the effect is medium-term. The effects are certain to occur, and the changes are negative; however, the magnitude is considered low as changes to habitat availability for Blask Ash and Northern Marsh Violet are likely to have small but discernible effects on the regional populations of these species given the small anticipated loss of habitat within the effects assessment Local Study Area (such as, 5 percent and 3 percent respectively) relative to what is available in the remainder of the effects assessment Local Study Area. Although not mapped for the Project, it is anticipated that additional suitable habitat for these two species is also available throughout the effects assessment Regional Study Area. As a result, the residual effects as a result of direct vegetation loss on Species at Risk and Species of Conservation Concern are determined to be not significant.

9.4.2.3.3 Changes to Vegetation as a Result of Changes to Hydrology

9.4.2.3.3.1 Potential Effects

Project activities such as road construction through wetlands, watercourse crossings, vegetation clearing, short-term water-taking and discharge of water during construction

can cause alterations of drainage patterns, impacts on surface water quality, and increased / decreased drainage flows and surface water levels. This can, in turn, cause changes to soils and vegetation health / composition thereby altering the availability, distribution, composition and function of retained upland, wetland and riparian ecosystems. Although wetland and riparian ecosystems experience water level fluctuations as part of natural variability, changes in the amplitude, frequency, and timing of flood or drought compared to historical levels can cause adverse effects. This effect may be felt more acutely in wetland ecosystems where water levels greatly influence vegetation community composition. If changes to hydrological regimes are notable enough to change the composition of a vegetation community, then the availability, distribution, composition, and function of that altered vegetation community type will also eventually be affected within the effects assessment Local Study Area.

Changes to surface water drainage can lead to increased levels of surface water runoff into adjacent communities, which can have an impact on the species composition of a community and the overall community classification. Additionally, linear disturbances obstructing surface flow between an upgradient and downgradient side of the Community Access Road can lead to increased water levels and pooling on the upgradient side, causing aerobic conditions and the accelerated decomposition of peat on the downgradient end, further influencing the composition and function of these communities (Vu, 2019).

The surface water quality within wetlands may also be affected by the construction of the Community Access Road. During construction, surface water may become contaminated if chemicals or substances (for example, petroleum products, sediments, and garbage) from Project equipment, vehicles, road surfaces, or blasting sites are transported into surface water during precipitation events (Surface Water Technical Support Document [Appendix F]). This includes contamination of surface water from accidental spills and leaks of chemicals and hazardous materials.

Additionally, there may be changes to surface water quality from increases in concentrations of suspended solids in waterbodies as a result of increased rates of erosion–sedimentation processes during water-taking and discharge activities. This might also occur following the removal of the diversion works and / or installation or removal of temporary waterbody crossing structures due to the disturbance of the bed and banks of a waterbody (Surface Water Technical Support Document [Appendix F]).

Furthermore, air emissions from Project activities during construction could result in changes to surface water quality (Surface Water Technical Support Document; Appendix F).

Areas in the Construction Disturbance Area are at highest risk of surface water contamination from the Project (Surface Water Technical Support Document; Appendix F).

Short-term residual changes to surface water quantity are predicted during construction because of short-term water discharges and water-taking and water diversions at waterbody crossings (Surface Water Technical Support Document; Appendix F). These residual effects have been assessed as likely to cause minimal changes to stream flows and / or water levels at receiving waterbodies and be limited to, at most, the spatial extent of the Local Study Area during construction (Surface Water Technical Support Document; Appendix F). This finding has been extrapolated to indicate that the resulting residual effects on wetland ecosystems is likewise expected to be minimal and limited to the Local Study Area during construction.

These indirect effects on retained vegetation communities are difficult to quantify as they largely depend on the effectiveness of the mitigation measures that are implemented.

9.4.2.3.3.2 Mitigation and Enhancement Measures

A list of mitigation measures to limit changes to surface water quantity and quality during construction is provided in the Surface Water Technical Support Document (Appendix F).

Additional mitigation measures that will be implemented during construction include:

- Have Environmental Monitors and Indigenous Environmental Monitors onsite during construction to confirm that all mitigation measures are being implemented appropriately. Details regarding Environmental Monitors and their role during the Project will be determined through the development of the Environmental Protection Plan;
- Design and implement a pre-, during- and post-construction monitoring program that assesses surface water movement and helps maintain pre-construction conditions to the extent feasible; and
- Implement adaptive management measures if drainage patterns are determined to be significantly altered. Adaptive management measures will be determined through the development of the Environmental Protection Plan.

Once further hydrological monitoring and water budget studies are undertaken during detail design, specific mitigation measures to maintain wetland hydrology may be required and will be included with detail design documentation as the Project schedule allows.

9.4.2.3.3.3 Predicted Residual Effects

With the implementation of the recommended mitigation measures, changes to hydrology will be minimized and impacts to retained vegetation communities should be minimal. However, this assumes that the mitigation measures will be sufficient to maintain pre-construction drainage patterns. It is expected that a robust monitoring program will be undertaken, and adaptive management measures implemented, as required. Changes to vegetation as a result of changes to hydrology is predicted to result in a residual effect and this interaction is carried forward to the residual effects characterization.

Changes to vegetation valued components resulting from changes in hydrology that may alter drainage patterns and increase or decrease drainage flows and surface water levels are expected to be **negative** in direction, **negligible** in magnitude, **local** in geographic extent, **long-term**, **infrequent**, **irreversible**, and **possible** to occur. As a result, the residual effects as a result of changes to hydrology on vegetation valued components are determined to be not significant.

9.4.2.3.4 Changes to Vegetation as a Result of Changes to Groundwater

9.4.2.3.4.1 Potential Effects

Project activities such as road construction through wetlands, changes to topography, short-term water-taking, pit / quarry dewatering and discharge of water can cause alterations of drainage patterns, recharge rates and increased / decreased groundwater levels. This can in turn cause changes to soils and vegetation health / composition thereby changing the composition and function of retained upland, wetland and riparian ecosystems. In particular, quarry and pit dewatering has potential to change groundwater levels near the excavation by more than 50 percent of the natural seasonal variability. Although wetland and riparian ecosystems experience water level fluctuations as part of natural variability, changes in the amplitude, frequency, and timing of drought compared to historical levels can cause adverse effects. This effect may be felt more acutely in wetland ecosystems where water levels greatly influence vegetation community composition.

The construction of the road across peatland wetland areas has the potential to interrupt groundwater flows through the peatland which could cause changes to the availability of groundwater to peatlands upgradient and downgradient of the Community Access Road. A more detailed discussion of potential effects on peatlands is provided in the Peatlands Technical Support Document (**Appendix I**).

Groundwater quality may be affected through changing groundwater levels which could have an impact on various wetland processes, a change in the groundwater chemistry in areas adjacent to the road, or through spills during construction. For example, the drying of peat, where the groundwater regime has been altered by construction and operation of the road, or impacted via climate change, could lead to an increase in production of methylmercury and inorganic mercury concentrations in those wetland communities. Additional discussion of groundwater quality effects on peatlands is provided in the Peatlands Technical Support Document (**Appendix I**).

If changes to groundwater regimes are notable enough to change the composition of a vegetation community, then the availability, distribution, composition, and function of that altered vegetation community type will also eventually be affected within the effects assessment Local Study Area.

These indirect effects on retained vegetation communities are difficult to quantify as they largely depend on the effectiveness of the mitigation measures that are implemented.

9.4.2.3.4.2 Mitigation and Enhancement Measures

A list of mitigation measures to limit changes to groundwater quantity and quality during construction is provided in the Groundwater Technical Support Document (**Appendix H**). The effectiveness of mitigation measures will be evaluated during construction and mitigation measures will be modified or enhanced as necessary through adaptive management.

Additional mitigation measures that will be implemented during construction include:

- Construct the Community Access Road through peatland communities using a “floating road” construction methodology to allow for groundwater movement below and through the road embankment. This approach can be found in **Appendix H** and the Groundwater **Section 9.3.4**.
- Mitigation measures as outlined in the Peatlands Technical Support Document (**Appendix I**).
- Have Environmental Monitors and Indigenous Environmental Monitors onsite during construction to confirm that all mitigation measures are being implemented appropriately. Details regarding Environmental Monitors and their role during the Project will be determined through the development of the Environmental Protection Plan;

- Design and implement a pre-, during- and post-construction monitoring program that assesses surface and groundwater movement that allows for the maintenance of pre-construction conditions to the extent feasible; and
- Implement adaptive management measures if drainage and groundwater flow patterns are determined to be significantly altered. Adaptive management measures will be determined through the development of an Environmental Protection Plan

9.4.2.3.4.3 Predicted Residual Effects

With the implementation of the recommended mitigation measures, changes to groundwater regimes will be minimized and impacts to retained vegetation communities should be minimal. However, this assumes that the mitigation measures will be sufficient to maintain pre-construction groundwater regimes. It is expected that a robust monitoring program will be undertaken, and adaptive management measures implemented, as required. This monitoring program is described in more detail in the Peatlands Technical Support Document (**Appendix I**).

Changes to vegetation valued components as a result of changes to groundwater quantity and quality is predicted to result in a residual effect and this interaction is carried forward to the residual effects characterization.

Changes to vegetation valued components resulting from changes in groundwater that may alter drainage patterns, decrease groundwater quality, and increase or decrease groundwater levels are expected to be negative in direction, medium in magnitude, local in geographic extent, long term, continuous, irreversible, and probable. As a result of the uncertainty related to the magnitude of effect that changes to groundwater will have on peatland wetlands, the residual effects as a result of changes to groundwater on these Wetland Ecosystems are determined to be significant. For all other vegetation valued components, the residual effects are determined to be not significant.

9.4.2.3.5 Changes to Vegetation as a Result of the Introduction and Spread of Invasive Plant Species

9.4.2.3.5.1 Potential Effects

The introduction and spread of invasive plant species can affect plant community composition and function over the long term. This is a particular concern for the Project given its remote nature and current absence of invasive plant species from the Project area. Indigenous communities including Aroland First Nation and Métis Nation of Ontario noted concerns related to the potential spread of invasive species (Dillon 2024a; Métis Nation of Ontario, 2023).

The resulting changes to vegetation communities can in turn have an effect on the function of those communities and their ability to support certain wildlife species. Specifically, the introduction of invasive plant species into new areas can reduce the quality of bird habitats by altering species diversity and the community plant structure through competition with native species, and by changing soil conditions (for example, nutrients, moisture) (Mack et al., 2000; Carlson and Shepherd, 2007; Truscott et al., 2008). Invasive plant species thrive in areas with recently disturbed soils and a high ratio of edge habitat as this improves their ability to establish and spread (Honnay et al., 2002). Invasive plant species often establish in fragmented landscapes along edge habitats, such as cleared areas adjacent to roads (Lafortezza et al., 2010).

Most non-native invasive plant species are introduced through various forms of human transport (Mack et al., 2000; Reichard and White, 2001). The regular movement of vehicles, equipment and personnel associated with the Project in-and-out of the Construction Disturbance Area could transport invasive plant seeds or plant parts into new areas inside and adjacent to the Construction Disturbance Area.

Vehicles and equipment can serve as dispersal mechanisms for plant seeds and vegetative parts that can get lodged in tires, the undercarriage, or mud on the surface of the vehicle (Parendes and Jones, 2000; Trombulak and Frissell, 2000). Many non-native invasive plant species are able to spread more easily in landscapes that have been fragmented, and often become established along edge habitats, such as disturbed road edges associated with transportation corridors (Lafortezza et al., 2010).

9.4.2.3.5.2 Mitigation and Enhancement Measures

It is generally more efficient and cost-effective to prevent the introduction and spread of invasive plant species in a new area compared to efforts aimed at removing those plants once established (Clark, 2003; Polster, 2003; Carlson and Shepard, 2007). To this end, the following mitigation measures are recommended:

- An Environmental Protection Plan will be developed during detail design, and will be implemented during construction to prevent, detect, control (such as, remove), and monitor areas with invasive species. The plan will also include the following measures:
  - Thoroughly inspect and clean construction equipment and vehicles prior to bringing them to the work area and when moving between work areas within the Project. Cleaning will be completed in accordance with the most up to date version of the Clean Equipment Protocol for Industry (Halloran et al., 2013). Documentation of the results of each inspection will be a requirement of the Environmental Protection Plan. Additional recommendations for the

cleaning of equipment (for example, the use of specific cleaning stations and their location) will be determined through the development of the Environmental Protection Plan.

- Use reduced disturbance techniques to prevent topsoil removal and preserve adequate substrate.
- Contour disturbed areas to minimize soil and water erosion and encourage growth of native vegetation.
- Limit off-road vehicle use by owner / operator during construction. Inspections and maintenance activities will include cleaning of off-road vehicles before and after each use to prevent the spread of invasive species. Recommendations related to the use of off-road vehicles will be determined at detail design and / or through the development of the Environmental Protection Plan.
- Use seed mixes with appropriate native species for all seeding and restoration works. Seed mixes must be tested / certified to be free of invasive species. Native seed should be sourced from local populations whenever possible.
- Require that the road operator follows Ministry of Transportation Ontario Provincial Standard Specification 803 to avoid spreading invasive plant species.

9.4.2.3.5.3 Predicted Residual Effects

With the implementation of the recommended mitigation measures and continued monitoring and control of invasive species, impacts to the retained vegetation communities should be minimal. However, this assumes that mitigation measures are effectively implemented, and all observations of invasive species are reported and addressed immediately. Changes to vegetation valued components as a result of the introduction and spread of invasive plant species during construction is predicted to result in a residual effect and this interaction is carried forward to the residual effects characterization.

During construction, invasive plant species may occasionally be introduced within the Effects Assessment Construction Disturbance Area. Best management practices and mitigation measures for controlling the spread of invasive species are well understood and the methods have been demonstrated to be effective, particularly if newly detected species are removed quickly. After implementation of mitigation, effects from the introduction of invasive plants are predicted to be possible, reversible in the short-term, infrequent, and confined to the Construction Disturbance Area. Effects from the

introduction of invasive plants on the vegetation valued components in the effects assessment Local Study Area are anticipated to be negative but negligible in magnitude. As a result, the residual effects as a result of changes the introduction and spread of invasive plant species on vegetation valued components are determined to be not significant.

9.4.2.3.6 Changes to Vegetation as a Result of Fragmentation and Edge Effects

9.4.2.3.6.1 Potential Effects

Clearing within an otherwise intact landscape introduces new fragmentation and a range of edge effects on retained vegetation communities, particularly evident in forested communities. Edge effects include the introduction and spread of invasive species, as well as sunscald, desiccation and windthrow which alter the microclimate of the retained communities. These effects influence the composition and function of the retained vegetation communities resulting in secondary effects (for example, altering habitat use by certain wildlife species). These secondary or indirect edge effects generally extend further into a forest than forest structure changes (Franklin et al., 2021). Some edge effects are anticipated to occur in the Project area and are expected to be more pronounced on south and west-facing forest edges.

While the landscape in the Project area is largely intact, there are anthropogenic and natural disturbances that have influenced the landscape. Notably, natural disturbances (primarily fire) have occurred over 20,741.7 hectares (18 percent) of the effects assessment Local Study Area, while anthropogenic disturbances were determined to cover 364.2 (<1 percent) of the effects assessment Local Study Area. In the effects assessment Regional Study Area, natural disturbances (primarily fire) have occurred over 30,365.1 hectares (7 percent) and anthropogenic disturbances cover a total of 540.4 hectares (<1 percent). These disturbances have caused minor fragmentation and edge effects on the existing landscape. The Project will create new anthropogenic disturbances layered over the existing disturbance regime. The total Construction Disturbance Area footprint is 4,700.2 ha.

9.4.2.3.6.2 Mitigation and Enhancement Measures

Mitigation measures that will be implemented during construction are as follows:

- Adjust the alignment or clear off centre within the right-of-way to minimize forest fragmentation and the creation of new forest edges, where feasible. These details will be refined during detail design;

- Construct temporary laydown areas and temporary construction camps on existing disturbed areas, wherever possible. The availability of existing disturbed areas for the construction of temporary laydown areas and temporary construction camps will be determined at detail design;
- Avoid grubbing along newly created forest edges to promote natural regeneration which will quickly "seal" the new forest edge;
- Use reduced disturbance techniques during construction to prevent topsoil removal, preserve adequate substrate (for example, use low impact method to leave surface vegetation root mat intact until a site is proven for further development); and
- Use progressive restoration onsite once temporary work areas (for example. staging areas) are no longer needed. Progressive restoration techniques will be provided in the Environmental Protection Plan.

9.4.2.3.6.3 Predicted Residual Effects

Changes to the retained vegetation valued components resulting from edge effects is predicted to result in a residual effect and this interaction is carried forward to the residual effects characterization.

Secondary effects on retained vegetation communities, particularly forested communities, may be felt following the clearing of the right-of way during construction of the Project. After implementation of mitigation, edge effects are predicted to be probable, reversible in the medium-term, frequent, and limited to the effects assessment Local Study Area. These edge effects are anticipated to be negative, but negligible in magnitude, particularly given that boreal forests are generally adapted to large-scale natural disturbances and are less influenced by fragmentation and edge effects than temperate and tropical forests. As a result, residual effects as a result of edge effects on vegetation valued components are determined to be not significant.

9.4.2.3.7 Changes to Vegetation from the Release of Sediment

9.4.2.3.7.1 Potential Effects

The Project has the potential to result in the release of sediment from vegetation clearing, earth moving, pit and quarry development and other construction activities. Sediment release into adjacent retained natural areas can have an effect on the composition and function of retained vegetation communities / vegetation valued components. The effects on vegetation would be expected to be very localized but

could include vegetation smothering and changes to drainage patterns and infiltration in the area of sediment deposits.

9.4.2.3.7.2 Mitigation and Enhancement Measures

Mitigation measures that will be implemented during construction include:

- Develop and implement a Project-specific Environmental Protection Plan;
- Develop and implement a Project-specific Erosion and Sediment Control Plan. Erosion and sediment control measures will be developed and implemented in accordance with Ontario Provincial Standard Specifications for erosion and sediment control measures (Ontario Provincial Standard Specifications 804 and 805). Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction;
- Regularly inspect and maintain Erosion and Sediment Control structures (for example, sediment fences, rip rap or other sediment control structures) in accordance with Ontario Provincial Standard Specifications 804 during all phases of the project and modify measures as necessary. If control measures are not functioning properly, no further work will occur until the problem is resolved;
- Stabilize disturbed areas through revegetation with native plant species or other appropriate means (for example, erosion control blankets) following completion of the works;
- Reschedule work or reduce / detour traffic in areas where soils are considered to be excessively wet or where there is a heavy rainfall risk. Areas where a reduction in traffic or detours are required are unknown at this design stage;
- Earthworks should be avoided during periods of heavy rainfall, particularly in areas adjacent to watercourses and wetlands; and
- Adhere to all mitigation measures outlined in the Fish and Fish Habitat Technical Support Document (**Appendix G**) and the Surface Water Technical Support Document (**Appendix F**).

9.4.2.3.7.3 Predicted Residual Effects

With the implementation of the mitigation measures, specifically implementation of a project-specific Erosion and Sediment Control Plan, changes to the retained vegetation valued components resulting from the release of sediment is not predicted to result in a residual effect. Should sediment be released into an adjacent vegetation community,

the effect would be very localized such that a measurable effect on the availability, distribution, composition, and function of vegetation valued components would not be realized. Therefore, this interaction is not carried forward to the residual effects characterization.

9.4.2.3.8 Changes to Vegetation from Spills of Fuel or Other Contaminants

9.4.2.3.8.1 Potential Effects

During Project construction, chemical or hazardous material spills (for example, petroleum products) can have detrimental effects on ecosystems in the affected area. Spills that occur in high enough concentrations can contaminate soils and affect soil organisms, vegetation health and survival, thereby affecting the composition and function of the affected vegetation communities and dependant wildlife. As a result, there is potential that the Project could cause spills of fuel or other contaminants that could negatively affect the composition and function of vegetation valued components. Indigenous communities including Weenusk First Nation noted concerns related to contamination of medicinal plants. In particular, the importance of these resources remaining uncontaminated as the community also relies on access to harvested medicines for treatments since the cost of travel south outside of Peawanuck is expensive. One community member noting, "My father used to gather some medicine when my mother would cough or get the flu (…) they used to boil (…) pinecones. My mother used to drink that. Tastes awful but it works."; and another community member referencing the use of Labrador Tea to combat aching bones and colds. The community also highlighted the importance of transmitting knowledge about medicines to the younger generation so that it is not lost (MNP LPP, 2024b).

9.4.2.3.8.2 Mitigation and Enhancement Measures

The following mitigation measures will be implemented during construction:

- Mitigation measures as outlined in the Fish and Fish Habitat Technical Support Document (**Appendix G**), Groundwater Technical Support Document (**Appendix H**) and the Surface Water Technical Support Document (**Appendix F**);
- Adherence to federal and provincial regulations and guidelines regarding fuel and residue, chemical product, petroleum product, and hazardous substance collection and storage, use and handling, and disposal and treatment, such as the federal *Transportation of Dangerous Goods Act*, Ontario *Dangerous Goods Transportation Act*, and the Ontario *Environmental Protection Act*; and
- Mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.2.3.8.3 Predicted Residual Effects

The implementation of mitigation measures outlined above are expected to effectively avoid and minimize the frequency, spatial extent, and severity of spills of chemicals and / or hazardous materials on site. Spills are expected to infrequently occur and are not expected to result in a measurable change to the availability, distribution, composition, and function of vegetation valued components relative to existing conditions. As a result, changes to the retained vegetation valued components resulting from spills of fuel or other contaminants was determined to have no residual effect and this interaction was not carried forward to the residual effects characterization.

9.4.2.3.9 Changes to Vegetation from the Deposition of Air Contaminants

9.4.2.3.9.1 Potential Effects

Construction of the Project is expected to generate air particulate emissions, including carbon monoxide, sulphur oxides (including sulphur dioxide), and nitrogen oxides. Construction activities are expected to produce air emissions from the use of construction vehicles, motorized equipment and machinery, power generators (to be used at temporary construction camps and temporary pits and quarries), the use of explosives (blasting), and the burning of non-hazardous waste materials (for example, food garbage at temporary construction camps).

The deposition of criteria air contaminant emissions can result in changes to soil and surface water quality, which has the potential to alter plant community structure, composition, and diversity by modifying the pH, nutrient content, and abundance and diversity of living organisms in the soil. Soil acidification can result from the deposition of sulphur and nitrogen oxides and uptake of these contaminants by plants can cause varying levels of effects on vegetation depending on the concentrations and durations of deposition.

Specifically, there is potential for effects on Traditional Use Plants resulting from the deposition of contaminants, including herbicides. This was a concern expressed by Aroland First Nation, with one community member specifically highlighting concerns relating to impacts on blueberries. In particular, the community expressed concerns related to impacts to berries (Dillon, 2024b; Shared Value Solutions, 2024). Weenusk First Nation and Fort Albany First Nation also noted similar concerns, in relation to how the Project may result in pollution effects (for example, vehicle emissions, dust) on plants and plant habitat (Firelight Research Inc., 2024; MNP LPP, 2024b). One community member from Fort Albany First Nation shared past observations relating to road pollution effects associated with the Victor Diamond Mine, noting browning of roadside adjacent vegetation (Firelight Research Inc., 2024).

"There's a winter road that goes right through my territory, and it's been 10 years maybe it's been used. Like they had those — first they start car-vehicles, nothing heavy. ... So, maybe about since the [Victor Diamond] mine started, and when they were hauling those heavy equipment and big, big materials, like those big trucks, mining trucks, those dump trucks, those big tractors. Those trucks are hauling the semis. They're going back and forth. I noticed that fumes were killing the plants, eh. ... You know, those plants were turning brown along the road, the side of the road. Maybe about 50 feet off, you'll see the plants go brown ... I noticed that fumes [from the vehicles] were killing the plants, eh." (Firelight Research Inc., 2024).

Air quality modelling was used to predict maximum ground-level concentrations of criteria air contaminant emissions during construction and operations as the methods and results for air quality modeling are presented in detail in the Atmospheric Environment Technical Support Document (**Appendix S**). During construction, most air criteria contaminants were predicted to be below Canadian Ambient Air Quality Standards and / or Ontario Ambient Air Quality Criteria thresholds. However, threshold exceedances for the Project were noted for nitrogen dioxide and sulphur dioxide, carbon monoxide, acrolein, and benzo(a)pyrene emissions. Most threshold exceedances were limited to less than 760 metres from the emission source. The exceptions to this distance threshold are nitrogen dioxide, sulphur dioxide, and carbon monoxide emissions during quarry blasting. During quarry blasting, nitrogen dioxide and sulphur dioxide emissions thresholds may be exceeded by up to 12.3 kilometres, while carbon monoxide emissions may exceed the Ontario Ambient Air Quality Criteria threshold out to 1.5 kilometres.

It should be noted that the air quality modelling incorporated conservative assumptions (such as, using worst-case scenarios) so effects would not be underestimated.

9.4.2.3.9.2 Mitigation and Enhancement Measures

A list of mitigation measures that will be implemented to limit air particulate emissions during construction is provided in the Atmospheric Environment Technical Support Document (**Appendix S**). The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Environmental approval conditions, permits, or authorizations issued for Project Construction, including those issued from Environment and Climate Change Canada, the Ontario Ministry of the Environment, Conservation and Parks and the Ontario Ministry of Natural Resources, will be followed during construction.

9.4.2.3.9.3 Predicted Residual Effects

During construction, emissions of criteria air contaminants may have negative effects on water, soils and vegetation composition and function.

An Environmental Protection Plan and Environmental Monitoring Plan developed for the Project, which will include adaptive management, are expected to limit the emissions of criteria air contaminants.

Even with mitigation, residual effects from the deposition of air contaminants on the condition of upland, wetland, and riparian ecosystems relative to existing conditions are anticipated. As such, residual effects from the deposition of air contaminants were carried forward into the residual effects characterization.

Soil contamination from emissions of criteria air contaminants during construction and operations may have negative effects on soils and vegetation communities. After implementation of mitigation, soil contamination from the emissions of criteria air contaminants is predicted to be possible, permanent (irreversible), continuous, and confined to the effects assessment Local Study Area. Effects from the soil contamination on the vegetation valued components in the effects assessment Local Study Area are anticipated to be negative but negligible in magnitude. As a result, the residual effects as a result of soil contamination from deposition of air contaminants on vegetation valued components are determined to be not significant.

9.4.2.3.10 Changes to Vegetation from Fugitive Dust Emissions

9.4.2.3.10.1 Potential Effects

Fugitive dust emissions are expected to be produced by the Project during construction activities such as land clearing, blasting, and infrastructure implementation (Dillon, 2025). Accumulation of airborne dust produced from the Project may result in local and direct changes to vegetation; for example, deposition of airborne dust onto vegetation can smother plant tissues, hinder gas exchange, and reduce photosynthesis by physically blocking sunlight. Dust particles often contain metals or pollutants, which can leach into the soil and lead to toxicity or nutrient imbalances in plants (Hirano et al., 1995; Prajapati, 2012). Consequently, the deposition of dust can affect plant health, and alter plant species composition, structure, and biomass in affected areas. The potential for impacts on vegetation related to the generation of dust has also been noted as a concern by the Métis Nation of Ontario Fort Albany First Nation, and Aroland First Nation (Métis Nation of Ontario, 2023; Shared Value Solutions, 2024). One community member from Aroland First Nation specifically noted concerns that dust, sand, and

debris would impact plants along the road, or make its way into the river system and watercourse crossings, noting the following:

“And all that dust that, especially the summertime with all that dust that’s flying around, it’s gonna have an impact on those plants along the road. And that’s where the, they’ll probably slowly die out because there’s so much sand on them […] plus the water system, the bridges, on the bridges there, they’ll be sand come, going into the river system, same thing. It’s gonna have an affect on the wildlife, and the plants even, the plants. Even the, I think it would really have an impact on insects too….and that’s another thing, the environment. All that dust kills the plants and everything, pollutes the water along the way." (Shared Value Solutions, 2024)

Air quality modelling was used to predict maximum ground-level concentrations of criteria air contaminant emissions during construction and operations as described in the Atmospheric Environment Technical Support Document (**Appendix S**). During construction, threshold exceedances for the Project are predicted for total suspended particulate, particulate matter less than 2.5 micrometres and particulate matter less than 10 micrometres emissions. Threshold exceedances for dust emissions are predicted to be reached at less than 300 metres from the emission source.

It should be noted that the air quality modelling incorporated conservative assumptions (in other words, using worst-case scenarios) so effects were not underestimated.

9.4.2.3.10.2 Mitigation and Enhancement Measures

A list of mitigation measures that will be implemented to limit dust deposition during construction is provided in the Atmospheric Environment Technical Support Document (**Appendix S**). These measures will be implemented to minimize effects from dust emissions and deposition on vegetation. The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction.

9.4.2.3.10.3 Predicted Residual Effects

Although mitigations will be implemented to reduce dust emissions, dust deposition during Project Construction are predicted to degrade vegetation immediately adjacent to the Project (within 100 metres). There are currently no plans to decommission the Project and dust deposition is expected over the life of the Project.

Even with mitigation, residual effects from dust emissions on the condition of upland, wetland, and riparian ecosystems relative to existing conditions are expected to occur. As such, residual effects from dust emissions were carried forward into the residual effects characterization.

Project Construction is expected to increase dust emissions. Although mitigations will be implemented to reduce dust emissions, dust deposition during construction and operations is predicted to degrade vegetation immediately adjacent to the Project. Effects from dust emissions are predicted to be certain, permanent (irreversible), continuous, and confined to the effects assessment Local Study Area. Effects from dust emissions on the vegetation valued components in the effects assessment Local Study Area are anticipated to be negative but negligible in magnitude. As a result, the residual effects as a result of dust emissions on vegetation valued components are determined to be not significant.

9.4.2.3.11 Changes to Vegetation as a Result of Increased Public Access

9.4.2.3.11.1 Potential Effects

The construction of the Community Access Road and associated infrastructure (for example, pits and quarries, temporary access roads, and worker camps) could negatively affect the availability and distribution of certain vegetation species, particularly Traditional Use Plant Species that are harvested for various small-scale uses (for example, medicinal, spiritual, food, home uses). Harvest pressure may increase from small communities close to the Project. This has been noted as a concern by Indigenous nations and communities including Métis Nation of Ontario and Weenusk First Nation (Métis Nation of Ontario, 2023; MNP LLP, 2024b). Additionally, increased road access also opens the Project area to potential future industry pressure (for example, timber harvesting and mining).

The construction of the Community Access Road will expand access to a broader range of individuals and groups. However, the region will remain relatively remote with the nearest urban centre (Thunder Bay with a population of approximately 111,000) being over 430 km from Marten Falls First Nation. Therefore, a large influx of individuals or groups harvesting plants for traditional use is not expected. Furthermore, the plant species typically harvested for traditional uses (by both Indigenous and non-Indigenous individuals) are common and abundant in the Project area. Given that impacts to the availability and distribution of Traditional Use Plant Species is unlikely affected to a measurable degree, this change may be viewed as a positive by increased access to these resources for local Indigenous communities.

Another potential effect from increased public access includes the introduction and spread of invasive plant species. Non-native and invasive plant species may compete with local native flora.

Finally, increased public access as a result of Construction of the Project may also introduce an additional risk of human-ignited wildfire (Morrison, 2007). The Climate Adaptation and Resiliency Technical Support Document (**Appendix Y**) also predicts that the warmer weather and less snow in winter that is expected to result from climate change will increase the likelihood of wildfires in the Project area and that the wildfires will burn hotter and faster and consume a greater area than they did historically. This increased wildfire frequency and extent may ultimately influence the availability and distribution, composition, and function of all vegetation valued components. This effect cannot be quantified at this time but should be considered in future planning phases and in the development of the Construction and Operations monitoring programs.

9.4.2.3.11.2 Mitigation and Enhancement Measures

The following mitigation measures will be implemented during construction:

- Limit the Project footprint, vegetation clearing and access road requirements to the extent feasible (for example, share / coordinate access, concentrate temporary activities spatially, leave habitat outside of scoped Construction Disturbance Area, selective clearing, use existing access roads when available). Reducing cleared areas and the number of access roads through coordination, can reduce the number of cleared areas and access roads that will be present during and following construction that may provide access to previously inaccessible lands;
- Use progressive restoration onsite once temporary work areas (for example, staging areas) are no longer needed and prevent ongoing use of inactive areas through combined use of physical control measures (rollback, remove of creek crossings, recontouring to surrounding topography, revegetation / reforesting and / or barriers at junctions with active access); and
- Develop a policy for Project personnel while on shift or at temporary construction camps in regards to any plant or timber harvesting activities.
- Develop a wildfire prevention plan for the construction works that outlines protocols for hot works or any other activity with potential to trigger a fire, required fire suppression equipment, and a response plan if a fire is triggered.

9.4.2.3.11.3 Predicted Residual Effects

Increased public access is not predicted to result in a measurable negative effect on vegetation valued components. Rather, increased access may result in a positive effect on local Indigenous communities with respect to increased access to harvest Traditional Use Plants; therefore, this interaction is not carried forward to the residual effects characterization.

9.4.2.4 Residual Effects – Operations Phase

9.4.2.4.1 Changes to the Availability and Distribution of Vegetation Valued Components as a result of Direct Vegetation Loss

9.4.2.4.1.1 Potential Effects

Upland, Wetland and Riparian Ecosystems

Operations activities, such as culvert or bridge replacements, may result in disturbance of vegetation. However, given the conservative assumptions used regarding the footprint area for Construction, it is assumed that these disturbances are already captured in the calculation of permanent loss during construction and would not represent additional direct loss of vegetation.

Designated Areas

Operations activities, such as culvert or bridge replacements, may result in disturbance of vegetation. However, given the conservative assumptions used regarding the footprint area for Construction, it is assumed that these disturbances are already captured in the calculation of permanent loss during construction and would not represent additional direct loss of vegetation

Traditional Use Plant Habitat Availability

Operations activities, such as culvert or bridge replacements, may result in disturbance of vegetation. However, given the conservative assumptions used regarding the footprint area for Construction, it is assumed that these disturbances are already captured in the calculation of permanent loss during construction and would not represent additional direct loss of vegetation

Species at Risk and Species of Conservation Concern

Operations activities, such as culvert or bridge replacements, may result in disturbance of vegetation. However, given the conservative assumptions used regarding the footprint area for Construction, it is assumed that these disturbances are already

captured in the calculation of permanent loss during construction and would not represent additional direct loss of vegetation.

9.4.2.4.1.2 Mitigation and Enhancement Measures

The following mitigation measures are recommended during operations:

- Prepare and implement an Environmental Protection Plan to keep vegetation from interfering with the safe and reliable operations of the Community Access Road; and
- Avoid re-entry and disturbance of restored temporary access areas post-construction.

9.4.2.4.1.3 Predicted Residual Effects

With the implementation of mitigation measures, and the conservative assumptions applied for construction, no additional clearing or disturbance of vegetation is expected during operations. Therefore, the interaction was not carried forward to the residual effects characterization.

9.4.2.4.2 Changes to the Composition and Function of Vegetation Valued Components as a Result of Direct Vegetation Loss

9.4.2.4.2.1 Potential Effects

Upland, Wetland and Riparian Ecosystems

With the implementation of mitigation measures, and the conservative assumptions applied for construction, no additional clearing or disturbance of vegetation is expected during operations. Therefore, the interaction was not carried forward to the residual effects characterization.

9.4.2.4.2.2 Mitigation and Enhancement Measures

Mitigation measures that will be implemented during construction and operations to minimize direct vegetation loss wherever and whenever possible are outlined in **Section 9.4.2.3.1.**

9.4.2.4.2.3 Predicted Residual Effects

With the implementation of mitigation measures, and the conservative assumptions applied for construction, no additional clearing or disturbance of vegetation is expected during operations. Therefore, the interaction was not carried forward to the residual effects characterization.

9.4.2.4.3 Changes to Vegetation as a Result of Changes to Hydrology

9.4.2.4.3.1 Potential Effects

Long-term residual changes to surface water quantity were predicted during operations as a result of changes in channel hydraulics at waterbody crossings and changes in land cover (Surface Water Technical Support Document; **Appendix F**). These residual effects were assessed as having minimal changes to stream flows and / or water levels at receiving waterbodies and limited to, at most, the spatial extent of the Local Study Area (Surface Water Technical Support Document; **Appendix F**). This finding has been extrapolated to indicate that the resulting residual effects on vegetation valued components is likewise expected to be minimal and limited to the Local Study Area during operations.

9.4.2.4.3.2 Mitigation and Enhancement Measures

A list of mitigation measures to limit changes to hydrology during operations is provided in the Surface Water Technical Support Document (**Appendix F**). The effectiveness of mitigation measures will be evaluated during operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.2.4.3.3 Predicted Residual Effects

Changes to the retained vegetation valued components resulting from changes to hydrology during operations is not predicted to result in a residual effect and this interaction is not carried forward to the residual effects characterization.

9.4.2.4.4 Changes to Vegetation as a Result of Changes to Groundwater

9.4.2.4.4.1 Potential Effects

During operations, short-term water takings from groundwater sources may be required for the repair of below ground structures such as footings or culverts. Additionally, as in the construction phase, aggregate extraction below the water table at pits or quarries may lower local groundwater levels. Periodic extraction from pits and quarries is expected to continue at some sources to provide material for road maintenance during operations.

Clearing of the Effects Assessment Construction Disturbance Area and resulting changes to vegetation cover may change groundwater infiltration rates for precipitation relative to the existing conditions. Areas that were cleared during construction but not maintained for use are expected to gradually return to similar existing conditions through active or passive restoration processes. In remaining areas, these changes to

groundcover will persist for the road right-of-way and any access roads, laydown areas, or pits and quarries that are maintained or re-activated for use during operations.

Equipment and vehicles used during operations will have the potential for malfunctions or accidents to cause leaks of fuels, oils, lubricants, coolants, and other potential contaminants. Storage and transfer of fuels and other chemicals in the Effects Assessment Construction Disturbance Area during operations also pose a risk of accidental spills. These accidental spills and leaks may contact the ground and migrate to the water table causing contamination of the groundwater.

9.4.2.4.4.2 Mitigation and Enhancement Measures

A list of mitigation measures to limit changes to groundwater quantity and quality during operations is provided in the Groundwater Technical Support Document (**Appendix H**). Additionally, adaptive management measures will be implemented if groundwater flow patterns are determined to be significantly altered.

9.4.2.4.4.3 Predicted Residual Effects

With the implementation of the recommended mitigation measures, changes to groundwater regimes will be minimized and impacts to retained vegetation communities should be minimal. However, this assumes that the mitigation measures will be sufficient to maintain pre-construction groundwater regimes. It is expected that a robust monitoring program will be undertaken, and adaptive management measures implemented, as required. This monitoring program is described in more detail in the Peatlands Technical Support Document (**Appendix I**).

Changes to vegetation valued components as a result of changes to groundwater quantity and quality is predicted to result in a residual effect and this interaction is carried forward to the residual effects characterization

Changes to vegetation valued components resulting from changes in groundwater that may alter drainage patterns and increase or decrease groundwater levels are expected to be negative in direction, medium in magnitude, local in geographic extent, long-term, continuous, irreversible, and probable to occur. As a result of the uncertainty related to the magnitude of effect that changes to groundwater will have on peatland wetlands, the residual effects as a result of changes to groundwater on these wetland Ecosystems are determined to be not significant. For all other vegetation valued components, the residual effects are determined to be not significant.

9.4.2.4.5 Changes to Vegetation as a Result of the Introduction and Spread of Invasive Plant Species

9.4.2.4.5.1 Potential Effects

During operations, regular vehicle traffic on the Community Access Road could transport invasive plant seeds or plant parts into the effects assessment Local Study Area. The indirect effects on vegetation resulting from the introduction of spread of invasive species described above, are also relevant to operations.

9.4.2.4.5.2 Mitigation and Enhancement Measures

The following mitigation measures are recommended during operations:

- Include the following measures as part of the Environmental Protection Plan to prevent, detect, control (such as, remove), and monitor areas with invasive species:
  - Limit off-road vehicle use by owner / operator during operations. Inspections and maintenance activities will include cleaning of off-road vehicles before and after each use to prevent the spread of invasive species. Recommendations related to the use of off-road vehicles will be determined at detail design and / or through the development of the Environmental Protection Plan.
  - Require that the road operator follows Ministry of Transportation Ontario Provincial Standard Specification 803 to avoid spreading invasive plant species.
  - Remove and manage invasive species using manual and mechanical meads. Herbicides will not be used.
  - Design and implement post-construction invasive species monitoring program that aims to detect invasive species presence and control (such as, remove) new introductions. Details of the post-construction invasive species monitoring program will be included in the Environmental Protection Plan.

9.4.2.4.5.3 Predicted Residual Effects

With the implementation of the recommended mitigation measures and continued monitoring and control of invasive species, impacts to the retained vegetation communities should be minimal. However, this assumes that mitigation measures are effectively implemented. Additionally, introduction of invasive plant species may be higher during operations due to public use of the Community Access Road. As such, changes to vegetation valued components as a result of the introduction and spread of

invasive plant species during operations is predicted to result in a residual effect and this interaction is carried forward to the residual effects characterization.

During construction and operations, invasive plant species may occasionally be introduced within the Effects Assessment Construction Disturbance Area. Best management practices and mitigation measures for controlling the spread of invasive species are well understood and the methods have been demonstrated to be effective, particularly if newly detected species are removed quickly. After implementation of mitigation, effects from the introduction of invasive plants are predicted to be possible, reversible in the short-term, infrequent, and confined to the Construction Disturbance Area. Effects from the introduction of invasive plants on the vegetation valued components in the effects assessment Local Study Area are anticipated to be negative but negligible in magnitude. As a result, the residual effects as a result of changes the introduction and spread of invasive plant species on vegetation valued components are determined to be not significant.

9.4.2.4.6 Changes to Vegetation as a Result of Fragmentation and Edge Effects

It is not expected that the operations phase will introduce new fragmentation or edge effects on the retained vegetation communities.

9.4.2.4.7 Changes to Vegetation from the Release of Sediment

9.4.2.4.7.1 Potential Effects

There is potential that activities during operations may cause the release of sediment to adjacent retained vegetation ecosystems. Large precipitation events may lead to run-off from the road and sedimentation in low lying areas such as wetland and riparian habitats. Similar to Construction, the effects would be localized, intermittent and variable throughout the year.

9.4.2.4.7.2 Mitigation and Enhancement Measures

The mitigation measures established and refined using adaptive management during Project Construction should be maintained during operations.

9.4.2.4.7.3 Predicted Residual Effects

With the implementation of the mitigation measures, specifically implementation of a project-specific Erosion and Sediment Control Plan, changes to the retained vegetation valued components resulting from the release of sediment is not predicted to result in a residual effect. Should sediment be released into an adjacent vegetation community,

the effect would be very localized such that a measurable effect on the availability, distribution, composition, and function of vegetation valued components would not be realized. Therefore, this interaction is not carried forward to the residual effects characterization.

9.4.2.4.8 Changes to Vegetation from Spills of Fuel or Other Contaminants

9.4.2.4.8.1 Potential Effects

There is the potential for accidental spills of fuels and other materials resulting from vehicle collisions during Operation and from malfunctions of equipment or spills during equipment or vehicle refuelling during Maintenance activities. The indirect effects on vegetation resulting from spills of fuel or other contaminants during operations are the same as discussed in the Construction section, above.

9.4.2.4.8.2 Mitigation and Enhancement Measures

During operations, mitigation measures will include a posting and enforcement of a speed limit on the highway, which should reduce potential for chemical or hazardous material spills by reducing vehicle collision risk.

A comprehensive list of mitigation measures to limit the risk and effects from spills of fuel and other contaminants during operations is provided in the Surface Water Technical Support Document (**Appendix F**), Groundwater and Technical Support Document (**Appendix H**), Physiography, Terrain, and Soils Technical Support Document (**Appendix N**).

9.4.2.4.8.3 Predicted Residual Effects

As discussed in the Surface Water Technical Support Document (**Appendix F**), Groundwater Technical Support Document (**Appendix H**), and Physiography, Terrain, and Soils Technical Support Document (**Appendix N**), there are predicted to be no residual effects from chemical or hazardous material spills on surface water quality, groundwater, or soil quality during construction or operations. The implementation of mitigation measures outlined above are expected to effectively avoid and minimize the frequency, spatial extent, and severity of spills of chemicals and / or hazardous materials on site. Spills are expected to infrequently occur and are not expected to result in a measurable change to the availability, distribution, composition, and function of vegetation valued components relative to existing conditions. As a result, changes to the retained vegetation valued components resulting from spills of fuel or other contaminants was determined to have no residual effect and this interaction was not carried forward to the residual effects characterization.

9.4.2.4.9 Changes to Vegetation from the Deposition of Air Contaminants

9.4.2.4.9.1 Potential Effects

During operations, air particulate emissions will be generated mainly from the use of fossil fuels associated with vehicle use of the Project and road maintenance (general, seasonal, and special maintenance).

As discussed in the Atmospheric Environment Technical Support Document (**Appendix S**), air criteria contaminants were predicted to be below Canadian Ambient Air Quality Standards and / or Ontario Ambient Air Quality Criteria thresholds based on air quality thresholds during operations.

It should be noted that the air quality modelling incorporated conservative assumptions (in other words, using worst-case scenarios) so effects would not be underestimated.

9.4.2.4.9.2 Mitigation and Enhancement Measures

A list of mitigation measures that will be implemented to limit air particulate emissions during operations is provided in the Atmospheric Environment Technical Support Document (**Appendix S**). The effectiveness of mitigation measures will be evaluated during operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.2.4.9.3 Predicted Residual Effects

During construction and operations, emissions of criteria air contaminants may have negative effects on water, soils and vegetation composition and function. Effects are expected to be larger during construction than during operations.

An Environmental Protection Plan and Environmental Monitoring Plan developed for the Project, which will include adaptive management, are expected to limit the emissions of criteria air contaminants.

Even with mitigation, residual effects from the deposition of air contaminants on the condition of upland, wetland, and riparian ecosystems relative to existing conditions are anticipated. As such, residual effects from the deposition of air contaminants were carried forward into the residual effects characterization.

Soil contamination from emissions of criteria air contaminants during construction and operations of the Project may have negative effects on soils and vegetation communities. After implementation of mitigation, soil contamination from the emissions of criteria air contaminants is predicted to be possible, permanent (irreversible), continuous, and confined to the effects assessment Local Study Area. Effects from the

soil contamination on the vegetation valued components in the effects assessment Local Study Area are anticipated to be negative but negligible in magnitude. As a result, the residual effects as a result of soil contamination from deposition of air contaminants on vegetation valued components are determined to be not significant.

9.4.2.4.10 Changes to Vegetation from Fugitive Dust Emissions

9.4.2.4.10.1 Potential Effects

Fugitive dust emissions are expected to be produced by the Project by traffic on the Community Access Road during operations. Accumulation of airborne dust produced from the Project may result in local and direct changes to vegetation as described in the Construction section above.

During Operations, threshold exceedances for the Project are predicted for particulate matter less than 2.5 micrometres, particulate matter less than 10 micrometres and total suspended particulate. The particulate matter less than 2.5 micrometres levels are predicted to reach the 24-hour and annual criteria thresholds at 115 metres and 134 metres from the road, respectively. Levels of particulate matter less than 10 micrometres are predicted to reach the 24-hour threshold at 1,986 metres from the road. Emissions of total suspended particulate are predicted to reach the 24-hour and annual thresholds at 3,004 metres and 899 metres from the road, respectively (Atmospheric Environment Technical Support Document; **Appendix S**).

It should be noted that the air quality modelling incorporated conservative assumptions (in other words, using worst-case scenarios) so effects were not underestimated.

9.4.2.4.10.2 Mitigation and Enhancement Measures

A list of mitigation measures that will be implemented to limit dust deposition during operations is provided in the Atmospheric Environment Technical Support Document (**Appendix S**). The effectiveness of mitigation measures will be evaluated during operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.2.4.10.3 Predicted Residual Effects

Although mitigations will be implemented to reduce dust emissions, dust deposition during construction and operations are predicted to degrade vegetation immediately adjacent to the Project (within 100 metres). There are currently no plans to decommission the Project and dust deposition is expected over the life of the Project.

Even with mitigation, residual effects from dust emissions on the condition of upland, wetland, and riparian ecosystems relative to existing conditions are expected to occur. As such, residual effects from dust emissions were carried forward into the residual effects characterization.

Construction and operations is expected to increase dust emissions. Although mitigations will be implemented to reduce dust emissions, dust deposition during construction and operations is predicted to degrade vegetation immediately adjacent to the Project. Effects from dust emissions are predicted to be **certain**, **permanent** (irreversible), **continuous**, and confined to the effects assessment Local Study Area. Effects from dust emissions on the vegetation valued components in the effects assessment Local Study Area are anticipated to be **negative** but **negligible** in magnitude. As a result, the residual effects as a result of dust emissions on vegetation valued components are determined to be not significant.

9.4.2.4.11 Changes to Vegetation as a Result of Increased Public Access

9.4.2.4.11.1 Potential Effects

The construction of the Community Access Road and associated infrastructure (for example, pits and quarries, temporary access roads, and worker camps) could negatively affect the availability and distribution of certain vegetation species, particularly Traditional Use Plant Species that are harvested for various small-scale uses (for example, medicinal, spiritual, food, home uses). Harvest pressure may increase from small communities close to the Project. This has been noted as a concern by Indigenous nations and communities including Métis Nation of Ontario and Weenusk First Nation (Métis Nation of Ontario, 2023; MNP LLP, 2024b). Additionally, increased road access also opens the Project area to potential future industry pressure (for example, timber harvesting and mining).

The construction of the Community Access Road will expand access to a broader range of individuals and groups. However, the region will remain relatively remote with the nearest urban centre (Thunder Bay with a population of approximately 111,000) being over 430 km from Marten Falls First Nation. Therefore, a large influx of individuals or groups harvesting plants for traditional use is not expected. Furthermore, the plant species typically harvested for traditional uses (by both Indigenous and non-Indigenous individuals) are common and abundant in the Project area. Given that impacts to the availability and distribution of Traditional Use Plant Species is unlikely affected to a measurable degree, this change may be viewed as a positive by increased access to these resources for local Indigenous communities.

Another potential effect from increased public access includes the introduction and spread of invasive plant species. Non-native and invasive plant species may compete with local native flora.

Finally, increased public access may also introduce an additional risk of human-ignited wildfire (Morrison, 2007). The Climate Adaptation and Resiliency Technical Support Document (**Appendix Y**) also predicts that the warmer weather and less snow in winter that is expected to result from climate change will increase the likelihood of wildfires in the Project area and that the wildfires will burn hotter and faster and consume a greater area than they did historically. This increased wildfire frequency and extent may ultimately influence the availability and distribution, composition, and function of all vegetation valued components. This effect cannot be quantified at this time, but should be considered in future planning phases and in the development of the monitoring programs.

9.4.2.4.11.2 Mitigation and Enhancement Measures

The following mitigation measures will be implemented during operations:

- Install access controls (for example, gates and boulders) to control public vehicle travel on some temporary access routes and trails; and,
- Install signage at regular intervals stating that any dumping is prohibited.

Marten Falls First Nation continues to engage in discussions with the Province regarding the ownership and future operations and maintenance of the Community Access Road Access and ownership including gating security / ID system will require further dialogue between the communities and the Province.

9.4.2.4.11.3 Predicted Residual Effects

Increased public access is not predicted to result in a measurable negative effect on vegetation valued components. Rather, increased access may result in a positive effect on local Indigenous communities with respect to increased access to harvest Traditional Use Plants; therefore, this interaction is not carried forward to the residual effects characterization.

9.4.2.5 Summary of Residual Effects

Table 9.4-7 provides a summary of the potential effects for vegetation, mitigation measures, and residual effects. Detailed information is included in **Appendix J**.

Table 9.4-7: Summary of Residual Effects for Vegetation and Characterization

Valued Component(s)	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Upland Ecosystems**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Brush and timber disposal • Pits and quarries • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the Aggregate Resource Act • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Changes to Upland Ecosystems as a result of direct vegetation loss	• Limit vegetation clearing to within the 100 metres right-of-way and reduce to less than this width to the extent possible. Specifically, – Minimize clearing widths in more sensitive ecosystems (for example, riparian ecosystems) and more difficult to restore vegetation community groups (for example, fen and bog) to the extent possible. – Adjust the alignment or clear off centre within the right-of-way where warranted, to minimize effects on more sensitive or difficult to restore vegetation communities. These details will be refined during detail design, prior to construction. – Limit clearing of riparian vegetation (within 30 metres of waterbodies) to the extent possible and to the requirement of the access road and alignment clearing width only. – Locate temporary access roads, staging areas, camps, and debris and / or timber stockpiles in less sensitive ecosystems (for example, upland ecosystems), where possible. Avoid peatland communities for temporary features wherever feasible. • Upon completion of construction, sand and gravel pits, including temporary access roads leading to the pits will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the Aggregate Resource Act, which will include backfilling, levelling, recompacting, and redistributing organic materials. Temporary access roads leading to temporary quarry areas will also be decommissioned. Temporary quarries not required for maintenance activities will be vegetated in accordance with the Rehabilitation Plan. Quarries maintained for operations will be blocked to discourage public use but facilitate access for ongoing road maintenance. • Perform clearing and construction activities in winter months where feasible.	• Residual changes to Upland Ecosystems as a result of direct vegetation loss.	• Context: Ecological • Direction: Negative • Magnitude: Low • Geographic Extent: Construction Disturbance Area • Duration: Long-term (for permanent impacts); Medium-term (for temporary impacts where vegetation communities can and will be restored) • Frequency: Continuous • Likelihood: Certain • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Direct

Valued Component(s)	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				• Develop and implement a Project-specific Environmental Protection Plan. • Have Environmental Monitors and Indigenous Environmental Monitors onsite during construction to confirm that all mitigation measures are being implemented appropriately. Details regarding Environmental Monitors and their role during the Project will be determined through the development of the Environmental Protection Plan • Reassess the status of Black Ash protection during future study phases. If Schedule 1 of Ontario Regulation 6/24 has been updated to include the area of the Project, a search for Black Ash trees will be completed at the Ogoki River crossing. Other suitable habitat in the south portion of the effects assessment Construction Disturbance Area may also need to be searched. The scope of this additional assessment will be determined in consultation with regulatory agencies. If Black Ash trees are anticipated to be affected by the Project, regulatory agencies (Ministry of the Environment, Conservation and Parks, Environment Canada and Climate Change) will be consulted on next steps. • Prepare and implement a Vegetation Management Plan at detail design that contains measures to protect rare plants, including protocols specified to Black Ash (for example, commitments to Emerald Ash Borer prevention measures and long-term surveillance). In the event a rare plant species is encountered unexpectedly, or cannot be avoided, the rare plant protection measures outlined in the Vegetation Management Plan will be implemented. • Consult with Ontario Parks at detail design to determine permitting, mitigation and / or compensation / offsetting expectations for direct impacts to the Albany River Provincial Park. • Consult with Ontario Parks at detail design to determine permitting, mitigation and / or compensation / offsetting expectations for		

Valued Component(s)	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				impacts to Critical Landform / Vegetation Associations. • Locate temporary access roads, staging areas, camps, and debris and / or timber stockpiles away from known Traditional Use Plant harvesting areas, where possible. • Prepare and Implement a Vegetation Restoration Plan. This plan will be developed through engagement and consultation and Indigenous communities and integration of local Indigenous Knowledge and stewardship protocols. • Include the seeding and / or planting of Traditional Use Plants in the Vegetation Restoration Plan.		
• **Wetland Ecosystems**	• Same as previous	• Construction	• Changes to Wetland Ecosystems as a result of direct vegetation loss	• Same as previous	• Residual changes to Wetland Ecosystems as a result of direct vegetation loss.	• Context: Ecological • Direction: Negative • Magnitude: Low • Geographic Extent: Construction Disturbance Area • Duration: Long-term (for permanent impacts); Medium-term (for temporary impacts where vegetation communities can and will be restored) • Frequency: Continuous • Likelihood: Certain • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Direct
• **Riparian Ecosystems**	• Same as previous	• Construction	• Changes to Riparian Ecosystems as a result of direct vegetation loss	• Same as previous	• Residual changes to Riparian Ecosystems as a result of direct vegetation loss.	• Context: Ecological • Direction: Negative • Magnitude: Low • Geographic Extent: Construction Disturbance Area • Duration: Long-term (for permanent impacts); Medium-term (for temporary impacts where vegetation communities can and will be restored) • Frequency: Continuous • Likelihood: Certain • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Direct

Valued Component(s)	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Designated Areas**	• Same as previous	• Construction	• Changes to Designated Areas as a result of direct vegetation loss	• Same as previous	• Residual changes to Designated Areas as a result of direct vegetation loss.	• Context: Ecological • Direction: Negative • Magnitude: Low • Geographic Extent: Construction Disturbance Area • Duration: Long-term (for permanent impacts); Medium-term (for temporary impacts where vegetation communities can and will be restored) • Frequency: Continuous • Likelihood: Certain • Significance: Not significant • Uncertainty: Low • Direct / Indirect: Direct
• **Traditional Use Plant Species**	• Same as previous	• Construction	• Changes to Traditional Use Plant Species as a result of direct vegetation loss	• Same as previous	• Residual effects to habitat for Traditional Use Plant Species as a result of direct vegetation loss.	• Context: Ecological • Direction: Negative • Magnitude: Low • Geographic Extent: Construction Disturbance Area • Duration: Long-term (for permanent impacts); Medium-term (for temporary impacts where vegetation communities can and will be restored) • Frequency: Continuous • Likelihood: Certain • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Direct
• **Species at Risk and Species of Conservation Concern**	• Same as previous	• Construction	• Changes to Species at Risk and Species of Conservation Concern as a result of direct vegetation loss	• Same as previous	• Residual changes to habitat for Species at Risk and Species of Conservation Concern as a result of direct vegetation loss.	• Context: Ecological • Direction: Negative • Magnitude: Low • Geographic Extent: Construction Disturbance Area • Duration: Long-term (for permanent impacts); Medium-term (for temporary impacts where vegetation communities can and will be restored) • Frequency: Continuous • Likelihood: Certain • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Direct

Valued Component(s)	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Wetland Ecosystems**	• Same as previous	• Construction	• Changes to Wetland Ecosystems due to changes in groundwater that may alter drainage patterns, groundwater regimes, or groundwater quality	• Same as previous	• Residual changes to Wetland Ecosystems due to changes in groundwater that may alter drainage patterns, groundwater regimes, or groundwater quality	• Context: Ecological • Direction: Negative • Magnitude: Medium • Geographic Extent: Local Study Area • Duration: Long-term • Frequency: Infrequent • Likelihood: Probable • Significance: Significant • Uncertainty: High • Direct / Indirect: Indirect
• **Wetland Ecosystems**	• Same as previous	• Operations	• Changes to Wetland Ecosystems due to changes in groundwater that may alter drainage patterns, groundwater regimes, or groundwater quality	• Same as previous	• Residual changes to Wetland Ecosystems due to changes in groundwater that may alter drainage patterns, groundwater regimes, or groundwater quality	• Context: Ecological • Direction: Negative • Magnitude: Medium • Geographic Extent: Local Study Area • Duration: Long-term • Frequency: Continuous • Likelihood: Probable • Significance: Significant • Uncertainty: High • Direct / Indirect: Indirect
• **All Valued Components**	• Road usage • Maintenance	• Operations	• Changes to all vegetation valued components as a result of direct vegetation loss	• Prepare and implement a Vegetation Management Plan to keep vegetation from interfering with the safe and reliable operations of the Community Access Road. • Avoid re-entry and disturbance of restored temporary access areas post-construction.	• No residual effect anticipated.	• No residual effect anticipated.
• **All Valued Components**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Brush and timber disposal • Pits and quarries • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls)	• Construction	• Changes all vegetation valued components as a result of changes to hydrology	• A list of mitigation measures to limit changes to surface water quality and quantity during construction is provided in the Surface Water Technical Support Document (**Appendix F**). • Additional Mitigation measures that will be implemented during construction include: – Have Environmental Monitors and Indigenous Environmental Monitors onsite during construction to confirm that all mitigation measures are implemented appropriately. Details regarding Environmental Monitors and their role during the Project will be determined through the development of the Environmental Protection Pan. – Design and implement a pre-, during- and post-construction monitoring program that assesses surface movement and helps	• Residual changes to vegetation due to changes in hydrology that may alter drainage patterns and increase or decrease flows and surface water levels	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local Study Area • Duration: Long-term • Frequency: Infrequent • Likelihood: Possible • Significance: Not Significant • Uncertainty: High • Direct / Indirect: Indirect

Valued Component(s)	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
	• Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the Aggregate Resource Act • Decommissioning of temporary camps, roads / trails and staging areas			maintain pre construction conditions to the extent feasible. – Implement adaptive management measures if drainage patterns are determined to be significantly altered. Adaptive Management will be determined through the development of Environmental Protection Plan. • Once further hydrological monitoring and water budget studies are undertaken at detail design, specific mitigation measures to maintain wetland hydrology may be required and will be included with detail design documentation as the Project schedule allows.		
• All Valued Components	• Road usage • Maintenance	• Operations	• Changes all vegetation valued components as a result of changes to hydrology	• A list of mitigation measures are outlined in the Surface Water Technical Support Document (Appendix F). • The effectiveness of mitigation measures will be evaluated during the Operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.	• No residual effect anticipated.	• No residual effect anticipated.
• **All Valued Components**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Brush and timber disposal • Pits and quarries • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*.	• Construction	• Changes all vegetation valued components as a result of changes to groundwater (except Wetland Ecosystems)	• A list of mitigation measure to limit changes to groundwater quantity and quality during construction is provided in the Groundwater Technical Support Document (**Appendix H**). The effectiveness of mitigation measures will be evaluated during construction and mitigation measures will be modified or enhanced as necessary through adaptive management. Additional mitigation measures that will be implemented during construction include: • Construct the Community Access Road through peatland communities using a “floating road” construction methodology to allow for groundwater movement below and through the road embankment. This approach will involve: – Completion of a detailed ground survey, characterizing the peat and local hydrology at a later stage of the Project / detail design. – Site-specific identification of appropriate values for peat strength.	• Residual changes to vegetation due to changes in groundwater that may alter drainage patterns or groundwater regimes (except Wetland ecosystems)	• Context: Ecological • Direction: Negative • Magnitude: Medium • Geographic Extent: Local Study Area • Duration: Long-term and irreversible • Frequency: Continuous • Likelihood: Probable • Significance: Not Significant • Uncertainty: Moderate • Direct / Indirect: Indirect

Valued Component(s)	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
	• Decommissioning of temporary camps, roads / trails and staging areas			– Use of a geogrid base to act as a separator and strengthener between the road subgrade fill materials and the peat. – Use of additional geogrid and geotextile materials in layers combined with road aggregate material above the embankment fill to form a mechanically stabilized layer. This layer will provide the required strength and stiffness for the road to perform during all seasons, including spring thaw. – Design the Floating Road Plan, profile and cross-section for each road section based on context-sensitive design standards, geometry and loading. – Provide transitions between floating road sections, excavated and fill sections. – Schedule construction to allow for primary settlement of the peat without risk of shear failure. – Monitor the work through construction, measuring and recording lateral movement and settlements. Be prepared to adjust the design based on observation and monitoring. • Mitigation measures as outlined in the Peatlands Technical Support Document (Appendix I). • The mitigation measures established and refined using adaptive management during Project Construction should be maintained during operations. • Have Environmental Monitors and Indigenous Environmental Monitors onsite during construction to confirm that all mitigation measures are being implemented appropriately. Details regarding Environmental Monitors and their role during the Project will be determined through the development of the Environmental Protection Plan; • Design and implement a pre-, during and post-construction monitoring program that assesses surface and groundwater movement that allows for the maintenance of pre construction conditions to the extent feasible.		

Valued Component(s)	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				• Implement adaptive management measures if groundwater flow patterns are determined to be significantly altered. Adaptive management measures will be determined through the development of the Environmental Protection Plan		
• **All Valued Components**	• Road usage • Maintenance	• Operations	• Changes all vegetation valued components as a result of changes to groundwater (except Wetland Ecosystems)	• A list of mitigation measures are outlined in the Groundwater Technical Support Document (**Appendix H**). • Implement adaptive management measures if groundwater flow patterns are determined to be significantly altered.	• Residual changes to vegetation due to changes in groundwater that may alter drainage patterns or groundwater regimes (except Wetland Ecosystems)	• Context: Ecological • Direction: Negative • Magnitude: Medium • Geographic Extent: Local Study Area • Duration: Long-term and irreversible • Frequency: Continuous • Likelihood: Probable • Significance: Not Significant • Uncertainty: Moderate • Direct / Indirect: Indirect
• **All Valued Components**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Brush and timber disposal • Pits and quarries • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Changes all vegetation valued components as a result of the introduction and spread of invasive plant species	• An Environmental Protection Plan will be developed during detail design, and will be implemented during construction to prevent, detect, control (in other words, remove), and monitor areas with invasive species. The plan will also include the following measures: – Thoroughly inspect and clean construction equipment and vehicles prior to bringing them to the work area and when moving between work areas within the Project. Cleaning will be completed in accordance with the most up to date version of the Clean Equipment Protocol for Industry (Halloran et al., 2013). Documentation of the results of each inspection will be a requirement of the Environmental Protection Plan. Additional recommendations for the clearing of equipment (for example, the use of specific cleaning stations and their location) will be determined through the development of the Environmental Protection Plan. – Use reduced disturbance techniques to prevent topsoil removal and preserve adequate substrate.	• Residual change to vegetation as a result of the introduction and spread of invasive plant species	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration: Long-term • Frequency: Infrequent • Likelihood: Possible • Significance: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect

Valued Component(s)	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				– Contour disturbed areas to minimize soil and water erosion and encourage growth of native vegetation. – Limit off-road vehicle use by owner / operator during construction. Inspections and maintenance activities will include cleaning of off-road vehicles before and after each use to prevent the spread of invasive species. Recommendations related to the use of off-road vehicles will be determined at detail design and / or through the development of the Environmental Protection Plan. – Use seed mixes with appropriate native species for all seeding and restoration works. Seed mixes must be tested / certified to be free of invasive species. Native seed should be sourced from local populations whenever possible. – Follow the Ministry of Transportation's Construction Specification for Vegetative Cover to avoid spreading invasive plant species (Ministry of Transportation, 2023).		
• **All Valued Components**	• Road usage • Maintenance	• Operations	• Changes all vegetation valued components as a result of the introduction and spread of invasive plant species	• Limit off-road vehicle use by owner / operator during Operations. Inspections and maintenance activities will include cleaning of off-road vehicles before and after each use to prevent the spread of invasive species. Recommendations related to the use of off-road vehicles will be determined at detail design and / or through the development of the Environmental Protection Plan. • Require that the road operator follows the Ministry of Transportation's Construction Specification for Vegetative Cover to avoid spreading invasive plant species (Ministry of Transportation, 2023). • Remove and manage invasive species using manual and mechanical means. Herbicides will not be used. • Design and implement post-construction invasive species monitoring program to detect invasive species presence and control (in other words, remove) new introductions. Details of the post-construction invasive species monitoring program will be included in the Environmental Protection Plan.	• Residual changes to vegetation as a result of the introduction and spread of invasive plant species	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration: Long-term • Frequency: Infrequent • Likelihood: Possible • Significance: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect

Valued Component(s)	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **All Valued Components**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trail • Temporary construction camps • Right-of-way clearing and grubbing • Brush and timber disposal • Pits and quarries • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Changes to all vegetation valued components as a result of fragmentation and edge effects	• Adjust the alignment or clear off centre within the right-of-way to minimize forest fragmentation and the creation of new forest edges, where feasible. These details will be refined during detail design. • Construct temporary laydown areas and temporary construction camps on existing disturbed areas, wherever possible. The availability of existing disturbed areas for the construction of temporary laydown areas and temporary construction camps will be determined at detail design. • Avoid grubbing along newly created forest edges to promote natural regeneration which will quickly “seal” the new forest edge. • Use reduced disturbance techniques during construction to prevent topsoil removal, preserve adequate substrate (for example, use low impact method to leave surface vegetation root mat intact until a site is proven for further development). • Use progressive restoration onsite once temporary work areas (for example, staging areas) are no longer needed. Progressive restoration techniques will be provided in the Environmental Protection Plan.	• Residual changes to vegetation as a result of fragmentation and edge effects	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local Study Area • Duration: Medium-term • Frequency: Frequent • Likelihood: Probable • Significance: Not Significant • Uncertainty: Moderate • Direct / Indirect: Indirect
• **All Valued Components**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Brush and timber disposal • Pits and quarries • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration	• Construction	• Changes to all vegetation valued components from the release of sediment during construction	• Develop and implement a Project-specific Environmental Protection Plan. • Develop and implement a Project-specific Erosion and Sediment Control Plan. Erosion and sediment control measures will be developed and implemented in accordance with Ontario Provincial Standard Specifications for erosion and sediment control measures (Ministry of Transportation, 2021a, 2021c). Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction. • Regularly inspect and maintain Erosion and Sediment Control structures (for example, sediment fences, rip rap or other sediment control structures) in accordance with the	• No residual effect anticipated.	• No residual effect anticipated.

Valued Component(s)	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
	• Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas			Construction Specification for Vegetative Cover during all phases of the project and modify measures as necessary (Ministry of Transportation, 2021a). If control measures are not functioning properly, no further work will occur until the problem is resolved. • Stabilize disturbed areas through revegetation with native plant species or other appropriate means (for example, erosion control blankets) following completion of the works. • Reschedule work or reduce / detour traffic in areas where soils are considered to be excessively wet or where there is a heavy rainfall risk. Areas where a reduction in traffic or detours are required are unknown at this design stage • Earthworks should be avoided during periods of heavy rainfall, particularly in areas adjacent to watercourses and wetlands. • Adhere to all mitigation measures outlined in the Fish and Fish Habitat Technical Support Document (**Appendix G**) and the Surface Water Technical Support Document (**Appendix F**).		
• **All Valued Components**	• Road usage • Maintenance	• Operations	• Changes to all vegetation valued components from the release of sediment during operations	• Mitigation measures established and refined using adaptive management during construction should be maintained during Operations.	• No residual effect anticipated.	• No residual effect anticipated.
• **All Valued Components**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Brush and timber disposal • Pits and quarries • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures,	• Construction	• Changes to Vegetation from spills of fuel or other contaminants	• Mitigation measures as outlined in the Fish and Fish Habitat Technical Support Document (**Appendix G**), Groundwater Technical Support Document (**Appendix H**) and the Surface Water Technical Support Document (**Appendix F**). • Adherence to federal and provincial regulations and guidelines regarding fuel and residue, chemical product, petroleum product, and hazardous substance collection and storage, use and handling, and disposal and treatment, such as the federal *Transportation of Dangerous Goods Act* (Government of Canada, 1992), Ontario *Dangerous Goods Transportation Act* (Government of Ontario, 1990j), and the	• No residual effect anticipated.	• No residual effect anticipated.

Valued Component(s)	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
	superstructures, traffic protection, erosion controls) • Construction site restoration • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas			Ontario *Environmental Protection Act* (Government of Ontario, 1990e). • Mitigation measures will be modified or enhanced as necessary through adaptive management.		
• **All Valued Components**	• Road usage • Maintenance	• Operations	• Changes to Vegetation from spills of fuel or other contaminants	• Mitigation measures as outlined in the Fish and Fish Habitat Technical Support Document (A**ppendix G**), Groundwater Technical Support Document (**Appendix H**) and the Surface Water Technical Support Document (**Appendix F**). • Adherence to federal and provincial regulations and guidelines regarding fuel and residue, chemical product, petroleum product, and hazardous substance collection and storage, use and handling, and disposal and treatment, such as the federal *Transportation of Dangerous Goods Act* (Government of Canada, 1992), Ontario *Dangerous Goods Transportation Act* (Government of Ontario, 1990j), and the Ontario *Environmental Protection Act* (Government of Ontario, 1990e).	• No residual effect anticipated.	• No residual effect anticipated.
• **All Valued Components**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Brush and timber disposal • Pits and quarries • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls)	• Construction	• Changes to vegetation from the deposition of air contaminants	• A list of mitigation measures that will be implemented to limit air particulate emissions during construction is provided in the Atmospheric Environmental Technical Support Document (**Appendix S**). The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management. • Environmental approval conditions, permits, or authorizations issued for Project Construction, including those issued from Environment and Climate Change Canada, The Ontario Ministry of the Environment, Conservation and Parks and the Ontario Ministry of Natural Resources, will be followed during construction.	• Residual changes to vegetation as a result of the deposition of air contaminants	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local Study Area • Duration: Long-term • Frequency: Continuous • Likelihood: Possible • Significance: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect

Valued Component(s)	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
	• Construction site restoration • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas					
• **All Valued Components**	• Road usage • Maintenance	• Operations	• Changes to vegetation from the deposition of air contaminants	• A list of mitigation measures that will be implemented to limit air particulate emissions during construction is provided in the Atmospheric Environmental Technical Support Document (Appendix S.) The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management. • Environmental approval conditions, permits, or authorizations issued for Project Construction, including those issued from Environment and Climate Change Canada, The Ontario Ministry of the Environment, Conservation and Parks and the Ontario Ministry of Natural Resources, will be followed during operations	• Residual changes to vegetation as a result of the deposition of air contaminants	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local Study Area • Duration: Long-term • Frequency: Continuous • Likelihood: Possible • Significance: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect
• **All Valued Components**	• Road usage • Maintenance	• Operations	• Changes to vegetation from the deposition of fugitive dust emissions	• A list of mitigation measures that will be implemented to limit air particulate emissions during construction is provided in the Atmospheric Environmental Technical Support Document (Appendix S.) The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management. • Environmental approval conditions, permits, or authorizations issued for Project Construction, including those issued from Environment and Climate Change Canada, The Ontario Ministry of the Environment, Conservation and Parks and the Ontario Ministry of Natural Resources, will be followed during operations	• Residual changes to vegetation as a result of the fugitive dust emissions	• Context: Ecological • Direction: Negative • Magnitude: Negligible. • Geographic Extent: Local Study Area • Duration: Long-term • Frequency: Continuous • Likelihood: Certain • Significance: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect

Valued Component(s)	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **All Valued Components**	• Road usage • Maintenance	• Operations	• Changes to vegetation from the deposition of fugitive dust emissions	• A list of mitigation measures that will be implemented to limit air particulate emissions during construction is provided in the Atmospheric Environmental Technical Support Document (Appendix S.) The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management. • Environmental approval conditions, permits, or authorizations issued for Project Construction, including those issued from Environment and Climate Change Canada, The Ontario Ministry of the Environment, Conservation and Parks and the Ontario Ministry of Natural Resources, will be followed during operations	• Residual changes to vegetation as a result of the fugitive dust emissions	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Local Study Area • Duration: Long-term • Frequency: Continuous • Likelihood: Certain • Significance: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect
• **All Valued Components**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Brush and timber disposal • Pits and quarries • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Changes to all vegetation valued components as a result of increased public access	• Limit the Project footprint, vegetation clearing and access road requirements to the extent feasible (for example, share / coordinate access, concentrate temporary activities spatially, leave habitat outside of scoped Construction Disturbance Area, selective clearing, use existing access roads when available). Reduced cleared areas and the number of access roads through coordination, can reduce the number of cleared areas and access roads that will be present during and following construction that may provide access to previously inaccessible lands. • Use progressive restoration onsite once temporary work areas (for example, staging areas) are no longer needed and prevent ongoing use of inactive areas through combined use of physical control measures (rollback, remove of creek crossings, recontouring to surrounding topography, revegetation / reforesting and / or barriers at junctions with active access). • Develop a policy for Project personnel while on shift or at temporary construction camps in regards to any plant or timber harvesting activities. • Develop a wildfire prevention plan for the construction works that outlines protocols for hot works or any other activity with potential to trigger a fire, required fire suppression equipment, and a response plan if a fire is triggered.	• No residual effect anticipated.	• No residual effect anticipated.

Valued Component(s)	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **All Valued Components**	• Road usage • Maintenance	• Operations	• Changes to all vegetation valued components as a result of increased public access	• Install access controls (for example, gates and boulders) to control public vehicle travel on some temporary access routes and trails. Marten Falls First Nation continues to engage in discussions with the Province regarding the ownership and future operations and maintenance of the Community Access Road. Access and ownership including gating security/ID system will require further dialogue between the communities and the Province. • Install signage at regular intervals stating that any dumping is prohibited.	• No residual effect anticipated.	• No residual effect anticipated.

9.4.3 Wildlife

9.4.3.1 Project-Environment Interactions

As a component of the effects assessment, the Project activities were reviewed to find potential environmental interactions. These interactions were then assessed for potential effects (**Table 9.4-8**).

Table 9.4-8: Project-Environment Interactions - Wildlife

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• Construction	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of way clearing and grubbing • Pits and quarries • Temporary concrete batch plants • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas	• All wildlife valued components	• Habitat Availability • Distribution	• Introduction and spread of invasive plant species—Can affect plant community composition, which can affect wildlife habitat availability and distribution. • Emissions of criteria air contaminants—Deposition of criteria air contaminant emissions (for example potential acid inputs) may change soil quality and vegetation and affect wildlife habitat availability and distribution. • Fugitive dust emissions—Deposition of dust particulates may change soil and vegetation quality and affect wildlife habitat availability and distribution. • Erosion and sedimentation—Vegetation clearing, earth moving, pit and quarry development and other Project activities can result in the release of sediment, which may change the composition and function of vegetation communities and affect wildlife habitat availability and distribution. • Changes in surface quantity—Alteration of surface water drainage patterns, flows and levels that can cause changes to soils and vegetation, which can affect wildlife habitat availability and distribution. • Changes in surface water quality—Changes in surface water quality from Project activities could adversely affect wildlife habitat availability and distribution. • Changes to groundwater —Changes in groundwater quality and quantity from Project activities could adversely affect wildlife habitat availability and distribution.
• Construction	• Same as previous	• All wildlife valued components	• Survival and Reproduction	• Increase in wildlife attractants — Attraction of wildlife to the Construction Disturbance Area (for example food waste, sewage, petroleum-based products, dust suppressants, explosive powder, site runoff ponds) may increase human-wildlife interactions and change predator-prey relationships, which can affect animal survival and abundance. • Blasting and associated fly rock—Blasting may result in injury or mortality to wildlife. • Chemical or hazardous material spills—Hazardous material (for example petroleum products, ammonium nitrate) on site or along access or haul roads can affect wildlife health and abundance.
• Construction	• Same as previous	• Bats	• Habitat Availability • Distribution • Survival and Reproduction	• Habitat loss—Habitat loss is the direct removal or alteration of soil and vegetation that may change habitat availability, use, and connectivity and influence bat abundance and distribution. • Habitat alteration—Alteration of final terrain and soil conditions, and / or plant species composition, could change the types of ecosystems that can be reclaimed on the landscape and adversely affect bat habitat availability, distribution, and abundance.
• Construction	• Same as previous	• Bats	• Habitat Availability • Survival and Reproduction	• Sensory disturbance—Sensory disturbance (for example lights, odours, noise, human activity) can alter bat habitat availability, use and connectivity (movement and behaviour), which can lead to changes in abundance and distribution.
• Construction	• Same as previous	• Bats	• Survival and Reproduction	• Incidental take—Site preparation and construction (including drilling and blasting) may result in the destruction of roosting and hibernating bats (incidental take). • Collision with vehicles and equipment—Project vehicles or heavy equipment use may cause injury or mortality to individual animals.

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• Construction	• Same as previous	• Furbearers (wolverine, American marten, beaver)	• Habitat Availability • Distribution • Survival and Reproduction	• Habitat loss—Habitat loss is the direct removal or alteration of soil and vegetation that may change furbearer habitat availability, use, and connectivity and influence furbearer abundance and distribution. • Habitat alteration—Alteration of final terrain and soil conditions, and / or plant species composition, could change the types of ecosystems that can be reclaimed on the landscape and adversely affect furbearer habitat availability, distribution, and abundance.
• Construction	• Same as previous	• Furbearers (wolverine, American marten, beaver)	• Habitat Availability • Distribution (wolverine only) • Survival and Reproduction	• Sensory disturbance—Sensory disturbance (for example lights, odours, noise, human activity) can alter furbearer habitat availability, use and connectivity (movement and behaviour), which can lead to changes in abundance and distribution.
• Construction	• Same as previous	• Furbearers (wolverine, American marten, beaver)	• Survival and Reproduction • Distribution	• Increase in predator access—Increased access for predators (for example wolf and black bear) and prey may increase predation risk and decrease survival and reproduction and alter distribution for furbearers.
• Construction	• Same as previous	• Furbearers (wolverine, American marten, beaver)	• Survival and Reproduction	• Incidental take—Site preparation and construction (including drilling and blasting) may result in the destruction or abandonment of furbearer dens, lodges (incidental take). • Collision with vehicles and equipment—Project vehicles or heavy equipment use may cause injury or mortality to individual animals. • Increase in public access—Could affect wildlife survival and reproduction through vehicle strikes, and / or legal and illegal hunting.
• Construction	• Same as previous	• Reptiles and Amphibians	• Habitat Availability • Distribution • Survival and Reproduction	• Habitat loss—Habitat loss is the direct removal or alteration of soil and vegetation that may change habitat availability, use, and connectivity and influence reptile and amphibian abundance and distribution • Habitat alteration—Alteration of final terrain and soil conditions, and / or plant species composition, could change the types of ecosystems that can be reclaimed on the landscape and adversely affect reptile and amphibian habitat availability, distribution, and abundance.
• Construction	• Same as previous	• Reptiles and Amphibians	• Habitat Availability • Survival and Reproduction	• Sensory disturbance—Sensory disturbance (for example lights, odours, noise, human activity) can alter reptile and amphibian habitat availability, use and connectivity (movement and behaviour), which can lead to changes in abundance and distribution.
• Construction	• Same as previous	• Reptiles and Amphibians	• Survival and Reproduction	• Incidental take—Site preparation and construction (including drilling and blasting) may result in the destruction or abandonment of gestation or hibernation site (incidental take). • Collision with vehicles and equipment—Project vehicles or heavy equipment use may cause injury or mortality to individual animals.
• Construction	• Same as previous	• Pollinating Insects	• Habitat Availability • Distribution • Survival and Reproduction	• Habitat loss—Habitat loss is the direct removal or alteration of soil and vegetation that may change furbearer habitat availability, use, and connectivity and influence pollinating insect abundance and distribution.
• Construction	• Same as previous	• Pollinating Insects	• Habitat Availability • Distribution • Survival and Reproduction	• Habitat alteration—Alteration of final terrain and soil conditions, and / or plant species composition, could change the types of ecosystems that can be reclaimed on the landscape and adversely affect pollinating insect habitat availability, distribution, and abundance.
• Construction	• Same as previous	• Pollinating Insects	• Habitat Availability • Survival and Reproduction	• Sensory disturbance—Sensory disturbance (for example lights, odours, noise, human activity) can alter reptile and amphibian habitat availability, use and connectivity (movement and behaviour), which can lead to changes in abundance and distribution.
• Construction	• Same as previous	• Pollinating Insects	• Survival and Reproduction	• Incidental take—Site preparation and construction (including drilling and blasting) may result in the destruction pollinating insects in various life stages (incidental take). • Collision with vehicles and equipment—Project vehicles or heavy equipment use may cause injury or mortality to individual insects.

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• Operations	• Operate the Community Access Road • Maintain the Community Access Road	• All wildlife valued components	• Habitat Availability • Distribution	• Introduction and spread of invasive plant species—Can affect plant community composition, which can affect wildlife habitat availability and distribution. • Emissions of criteria air contaminants—Deposition of criteria air contaminant emissions (for example potential acid inputs) may change soil quality and vegetation and affect wildlife habitat availability and distribution. • Fugitive dust emissions—Deposition of dust particulates may change soil and vegetation quality and affect wildlife habitat availability and distribution. • Erosion and sedimentation—Vegetation clearing, earth moving, pit and quarry development and other Project activities can result in the release of sediment, which may change the composition and function of vegetation communities and affect wildlife habitat availability and distribution. • Changes in surface water quantity—Alteration of drainage patterns and increased / decreased drainage flows and surface water levels can cause changes to soils and vegetation, which can affect wildlife habitat availability. • Changes in surface water quality—Changes in surface water quality from Project activities could adversely affect wildlife habitat availability and distribution. • Changes to groundwater —Changes in groundwater quality and quantity from Project activities could adversely affect wildlife habitat availability and distribution.
• Operations	• Operate the Community Access Road • Maintain the Community Access Road	• All Wildlife Valued Components	• Survival and Reproduction	• Increase in wildlife attractants—Attraction of wildlife to the Project site (for example food waste, sewage, petroleum-based products, dust suppressants, explosive powder, site runoff ponds) may increase human-wildlife interactions and change predator-prey relationships, which can affect animal survival and abundance. • Blasting and associated fly rock—May result in injury or mortality to wildlife. • Chemical or hazardous material stored on the Project site, or spills—Hazardous material (for example petroleum products, ammonium nitrate) on site or along access or haul roads can affect wildlife health and abundance.
• Operations	• Operate the Community Access Road • Maintain the Community Access Road	• Bats	• Habitat Availability • Distribution • Survival and Reproduction	• Habitat loss—Habitat loss is the direct removal or alteration of soil and vegetation that may change habitat availability, use, and connectivity and influence bat abundance and distribution.
• Operations	• Operate the Community Access Road • Maintain the Community Access Road	• Bats	• Habitat Availability • Distribution • Survival and Reproduction	• Habitat alteration—Alteration of final terrain and soil conditions, and / or plant species composition, could change the types of ecosystems that can be reclaimed on the landscape and adversely affect bat habitat availability, distribution, and abundance.
• Operations	• Operate the Community Access Road • Maintain the Community Access Road	• Bats	• Habitat Availability • Survival and Reproduction	• Sensory disturbance—Sensory disturbance (for example lights, odours, noise, human activity) can alter bat habitat availability, use and connectivity (movement and behaviour), which can lead to changes in abundance and distribution.
• Operations	• Operate the Community Access Road • Maintain the Community Access Road	• Bats	• Survival and Reproduction	• Incidental take—General maintenance (including drilling and blasting) may result in the destruction of roosting and hibernating bats (incidental take). • Collision with vehicles and equipment—Project vehicles or heavy equipment use may cause injury or mortality to individual animals.
• Operations	• Operate the Community Access Road • Maintain the Community Access Road	• Furbearers (wolverine, American marten, beaver)	• Habitat Availability • Distribution • Survival and Reproduction	• Habitat loss—Habitat loss is the direct removal or alteration of soil and vegetation that may change furbearer habitat availability, use, and connectivity and influence furbearer abundance and distribution. • Habitat alteration—Alteration of final terrain and soil conditions, and / or plant species composition, could change the types of ecosystems that can be reclaimed on the landscape and adversely affect furbearer habitat availability, distribution, and abundance.

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• Operations	• Operate the Community Access Road • Maintain the Community Access Road	• Furbearers (wolverine, American marten, beaver)	• Habitat Availability • Distribution (wolverine only) • Survival and Reproduction	• Sensory disturbance—Sensory disturbance (for example lights, odours, noise, human activity) can alter furbearer habitat availability, use and connectivity (movement and behaviour), which can lead to changes in abundance and distribution.
• Operations	• Operate the Community Access Road • Maintain the Community Access Road	• Furbearers (wolverine, American marten, beaver)	• Survival and Reproduction	• Incidental take—Maintenance activities (including drilling and blasting) may result in the destruction or abandonment of furbearer dens, lodges (incidental take). • Collision with vehicles and equipment—Project vehicles or heavy equipment use may cause injury or mortality to individual animals. • Increase in public access—Could affect wildlife survival and reproduction through vehicle strikes, and / or legal and illegal hunting.
• Operations	• Operate the Community Access Road • Maintain the Community Access Road	• Furbearers (wolverine, American marten, beaver)	• Distribution • Survival and Reproduction	• Increased predator access—Increased access for predators (for example wolf, coyote, and black bear) and prey may increase predation risk and decrease survival and reproduction for furbearers.
• Operations	• Operate the Community Access Road • Maintain the Community Access Road	• Reptiles and Amphibians	• Habitat Availability • Distribution • Survival and Reproduction	• Habitat loss—Habitat loss is the direct removal or alteration of soil and vegetation that may change habitat availability, use, and connectivity and influence reptile and amphibian abundance and distribution. • Habitat alteration—Alteration of final terrain and soil conditions, and / or plant species composition, could change the types of ecosystems that can be reclaimed on the landscape and adversely affect reptile and amphibian habitat availability, distribution, and abundance.
• Operations	• Operate the Community Access Road • Maintain the Community Access Road	• Reptiles and Amphibians	• Habitat Availability • Survival and Reproduction	• Sensory disturbance—Sensory disturbance (for example lights, odours, noise, human activity) can alter reptile and amphibian habitat availability, use and connectivity (movement and behaviour), which can lead to changes in abundance and distribution.
• Operations	• Operate the Community Access Road • Maintain the Community Access Road	• Reptiles and Amphibians	• Survival and Reproduction	• Incidental take—Maintenance activities (including drilling and blasting) may result in the destruction or abandonment of gestation or hibernation site (incidental take). • Collision with vehicles and equipment—Project vehicles or heavy equipment use may cause injury or mortality to individual animals.
• Operations	• Operate the Community Access Road • Maintain the Community Access Road	• Pollinating Insects	• Habitat Availability • Distribution • Survival and Reproduction	• Habitat loss—Habitat loss is the direct removal or alteration of soil and vegetation that may change furbearer habitat availability, use, and connectivity and influence pollinating insect abundance and distribution. • Habitat alteration—Alteration of final terrain and soil conditions, and / or plant species composition, could change the types of ecosystems that can be reclaimed on the landscape and adversely affect pollinating insect habitat availability, distribution, and abundance.
• Operations	• Operate the Community Access Road • Maintain the Community Access Road	• Pollinating Insects	• Habitat Availability • Survival and Reproduction	• Sensory disturbance—Sensory disturbance (for example lights, odours, noise, human activity) can alter reptile and amphibian habitat availability, use and connectivity (movement and behaviour), which can lead to changes in abundance and distribution.
• Operations	• Operate the Community Access Road • Maintain the Community Access Road	• Pollinating Insects	• Survival and Reproduction	• Incidental take—Maintenance activities (including drilling and blasting) may result in the destruction pollinating insects in various life stages (incidental take). • Collision with vehicles and equipment—Project vehicles or heavy equipment use may cause injury or mortality to individual insects.

9.4.3.2 Discipline-Specific Characteristics

In support of the residual effects characteristics described in **Section 6.7.3**, **Table 6-1**, the following wildlife definitions apply to the effects assessment.

Ecological and Social Context

Ecological context for wildlife valued components considers species sensitivity, resilience, and adaptive capacity, current status and trends, and applicable legislation and best management practices. It also considers Indigenous Knowledge, where available. Consideration of ecological context includes timing, such as when the effect could occur during a critical life cycle of the valued component. Context also informs whether the residual effect would alter the ability of the valued component populations to be self-sustaining and ecologically effective (in other words, the determination of significance). Ecological context is discussed with other characteristics such as magnitude, geographic extent, duration, reversibility, and probability of occurrence used to characterize residual effects and determine significance.

Magnitude

Integrating ecological context to understand the point at which a given magnitude is large enough to be critical for a valued component is directly linked to the self-sustaining and ecologically effective status of the population, and therefore directly linked to significance.

9.4.3.3 Residual Effects - Construction Phase

9.4.3.3.1 Changes to Wildlife through the Introduction and Spread of Invasive Plant Species

9.4.3.3.1.1 Potential Effects

The introduction of invasive plant species into new areas can alter vegetation species diversity and the community plant structure through competition with native species, and by changing soil conditions (for example, nutrients, moisture) (Mack et al., 2000; Carlson and Shephard, 2007; Truscott et al., 2008). These changes could have negative effects on wildlife habitat availability and distribution.

9.4.3.3.1.2 Mitigation and Enhancement Measures

An Environmental Protection Plan would be implemented during construction to prevent, detect, control (in other words, remove), and monitor areas with weed species. Construction equipment and vehicles would be cleaned prior to arriving on site.

Construction materials would be checked and seed mixes tested for presence of invasive plants prior to use for reclamation / restoration.

During construction, reduced disturbance techniques will be used to prevent topsoil removal and preserve adequate substrate. Disturbed areas will be contoured to minimize soil and water erosion and encourage growth of native vegetation. Off-road vehicle use by owner / operator will be limited during construction. Inspections and maintenance activities will include cleaning of off-road vehicles before and after each use to prevent the spread of invasive species and to identify any fuel leaks or equipment damage.

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources, will be followed during construction.

The effectiveness of mitigation measures will be evaluated during construction and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.3.3.1.3 Predicted Residual Effects

During construction, invasive plant species may occasionally be introduced within the effects assessment Construction Disturbance Area. Best management practices and mitigation measures for controlling the spread of invasive species are well understood and the methods have been demonstrated to be effective. Should invasive plants be introduced from construction vehicles, the plants will be contained and removed quickly resulting in a small, localized effect in the Construction Disturbance Area that is reversible in the short-term and therefore the effect is not predicted to reduce or degrade wildlife habitat. During construction, effects are possible and infrequent. Effects from the introduction of invasive plants on the ability of the wildlife populations in the effects assessment Regional Study Area to remain self-sustaining and ecologically functional are anticipated to be negative but **negligible** in magnitude.

9.4.3.3.2 Changes to Wildlife from Emissions of Criteria Air Contaminants

9.4.3.3.2.1 Potential Effects

The deposition of criteria air contaminant emissions can result in changes to soil and surface water quality, which has the potential to alter plant community structure, composition, and diversity by modifying the pH, nutrient content, and abundance and diversity of living organisms. Contamination of water, soil, and vegetation quality from

deposition of Project air emissions has the potential to negatively affect wildlife if it reduces the quality of suitable forage and habitat, which could ultimately affect the distribution of wildlife populations. This was also a concern that was also noted by Indigenous communities including Mushkegowuk Council, Kingfisher Lake First Nation, and Animbiigoo Zaagi'igan Anishinaabek (NextBridge Infrastructure, 2018; SNC-Lavalin, 2020; Stantec, 2017). The concern was noted through shared Indigenous Knowledge particularly relating to effects on wildlife as a result exposure / ingestion of contaminants due to emissions.

Air quality modelling was used to predict maximum ground-level concentrations of criteria air contaminant emissions during construction and operations. The methods and results for air quality modelling are presented in detail in the Atmospheric Environment Technical Support Document (**Appendix S**). During construction, most air criteria contaminants were predicted to be below Canadian Ambient Air Quality Standards and / or Ontario Ambient Air Quality Criteria thresholds. However, threshold exceedances were noted for nitrogen dioxide and sulphur dioxide, carbon monoxide, acrolein, and benzo(a)pyrene emissions. Most threshold exceedances were limited to less than 760 metres from the emission source. The exceptions are nitrogen dioxide, sulphur dioxide, carbon monoxide emissions during quarry blasting. During quarry blasting, nitrogen dioxide and sulphur dioxide emissions thresholds may be exceeded by up to 12.3 km, while carbon monoxide emissions may exceed the Ontario Ambient Air Quality Criteria threshold out to 1.5 km.

9.4.3.3.2.2 Mitigation and Enhancement Measures

A comprehensive list of mitigation measures that will be implemented to limit air particulate emissions during construction is provided in the Atmospheric Environment Technical Support Document (**Appendix S**).

9.4.3.3.2.3 Predicted Residual Effects

Emissions of criteria air contaminants are anticipated to have negligible, possible effects on vegetation ecosystems, and, ultimately, wildlife habitat. As such, this interaction was determined to have no residual effects on wildlife habitat availability and distribution and is not carried forward in the assessment.

9.4.3.3.3 Changes to Wildlife from Fugitive Dust Emissions

9.4.3.3.3.1 Potential Effects

Fugitive dust emissions were a concern that was highlighted by Indigenous communities, including Marten Falls First Nation, Aroland First Nation and Weenusk First Nation (Marten Falls First Nation, 2023; MNP LPP, 2024b; Shared Value Solutions,

2024). One community member from Aroland First Nation specifically noted concerns that dust, sand and debris would affect plants along the road, or make its way into the river system watercourse crossings, noting the following:

“And all that dust that, especially the summertime with all that dust that’s flying around, it’s going to have an impact on those plants along the road. And that’s where the, they’ll probably slowly die out because there’s so much sand on them […] plus the water system, the bridges, on the bridges there, they’ll be sand come, going into the river system, same thing. It’s going to have an affect on the wildlife, and the plants even, the plants. Even the, I think it would really have an impact on insects too….and that’s another thing, the environment. All that dust kills the plants and everything, pollutes the water along the way." (Shared Value Solutions, 2024).

Accumulation of airborne dust produced from the Project may result in direct, localized changes to vegetation. For example, deposition of airborne dust onto vegetation can smother plant tissues, hinder gas exchange, and reduce photosynthesis by physically blocking sunlight (Farmer, 1993). Consequently, the deposition of dust can and alter plant species composition, structure, and biomass. As a result, dust generated by Project construction activities could adversely affect wildlife by degrading habitat quality and forage availability.

Threshold exceedances for the Project during construction are predicted for total suspended particulate matter less than 2.5 micrometres and particulate matter less than 10 micrometres emissions. Threshold exceedances for dust emissions are predicted to be reached at less than 300 metres from the emission source.

9.4.3.3.3.2 Mitigation and Enhancement Measures

Dust deposition will be minimized during construction by following best industry practices and adhering to relevant government threshold values for deposition of acidifying compounds on specific plant species. Potential mitigation measures outlined in the Ontario Ministry of Transportation Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions for Provincial Transportation Projects (Ontario Ministry of Transportation, 2020) may be implemented, if feasible.

A list of mitigation measures that will be implemented to limit dust deposition during construction is provided in the Atmospheric Environment Technical Support Document (**Appendix S**). The effectiveness of mitigation measures will be evaluated during construction and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.3.3.3.3 Predicted Residual Effects

Mitigation measures to limit dust emissions are predicted to be more effective during construction. As such, there is a predicted net residual effect on wildlife habitat availability, distribution, and survival and reproduction from the construction phase.

Although mitigations will be implemented to reduce dust emissions, dust deposition during construction are predicted to degrade vegetation immediately adjacent to the Project and dust deposition is expected over the life of the Project (long term). There are currently no plans to decommission the Community Access Road, therefore, residual effects are largely irreversible. Effects from dust emissions during construction are predicted to be certain, irreversible, continuous, and confined to the wildlife effects assessment Local Study Area. Effects from dust emissions on the ability of the wildlife populations in the wildlife effects assessment Regional Study Area to remain self-sustaining and ecologically functional are anticipated to be negative and negligible in magnitude.

9.4.3.3.4 Changes to Wildlife from Erosion and Sedimentation

9.4.3.3.4.1 Potential Effects

Project Construction activities such as watercourse crossings, vegetation clearing, earth moving, pit and quarry development and other construction activities can result in exposure of vulnerable banks or slopes resulting in increased release of sediment. Sediment release into adjacent retained natural areas can have an effect on the composition and function of vegetation communities (Vegetation Technical Support Document [**Appendix J**]). These changes can reduce or degrade wildlife habitat through localized changes in ecosystem composition, particularly wetland and riparian areas. The effects on vegetation would be expected to be localized and occur intermittently during construction but could include vegetation smothering and changes to drainage patterns and infiltration in the area of sediment deposits. The Ministry of Transportation Environmental Guide for Erosion and Sediment Control During Construction of Highway Projects (2007) will be consulted during the development of erosion and sediment control measures.

9.4.3.3.4.2 Mitigation and Enhancement Measures

An environmental monitoring program will be developed and implemented during construction and will contain mitigation measures to control erosion and sedimentation. Erosion and sediment control measures will be developed and implemented in accordance with Ontario Provincial Standard Specifications for erosion and sediment control measures (OPSS, 2021a and OPSS, 2021b). Environmental approval

conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources, will be followed during construction.

A comprehensive list of mitigation measures that will be implemented during construction is provided in Vegetation Technical Support Document (**Appendix J**) and Surface Water Technical Support Document (**Appendix F**). These measures will be implemented to minimize effects from changes to erosion and sedimentation in the wildlife effects assessment Local Study Area during construction.

Mitigation measures to limit erosion and sedimentation are well understood and the methods have been demonstrated to be effective. The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.3.3.4.3 Predicted Residual Effects

Construction of the Project could result in localized increase in erosion-sedimentation processes at locations upstream or downstream of watercourse crossings and at receiving waterbodies. Environmental protection and monitoring plans developed for the Project Construction are expected to limit erosion and sedimentation. After implementing mitigation, the Project is not predicted to result in residual effects on the condition of peatland, upland, wetland and riparian ecosystems (in other words, wildlife habitat), relative to existing conditions (Vegetation Technical Support Document [Appendix J]). As such, this interaction was not carried forward in the assessment.

9.4.3.3.5 Changes to Wildlife resulting in changes to Surface Water Quantity

9.4.3.3.5.1 Potential Effects

Construction activities such as constructing watercourse crossings, vegetation clearing, short-term water takings, and discharge of construction water can cause changes to stream flows and / or water levels and erosion–sedimentation processes within or immediately upstream and downstream of the work area. Changes in the volume or rate of surface water during construction of the Project may adversely affect soils, peatland, wetland, and riparian ecosystems through desiccation or inundation. Peatland, wetland, and riparian ecosystems experience water level fluctuations as part of natural variability and riparian ecosystems can recover relatively quickly from flooding.

Fluctuating surface water levels typically influence plant species composition, community structure, and species richness, and preventing changes in wetland water

levels can cause a decrease in aquatic plant community diversity. Alternatively, changes in the amplitude, frequency, and timing of flood or drought compared to historical levels can cause adverse effects on wetlands, riparian areas, and peatlands. These changes can alter wildlife habitat availability and distribution through localized changes in ecosystem composition and function, particularly peatland, wetland, and riparian areas. Indigenous communities including Fort Albany First Nation highlighted concerns related to potential effects on and loss of peatland habitats. In particular, how the loss of air filtering capacity due to peatland loss might result in changes to the diet of wildlife species, particularly for small mammals and rodents (Fort Albany First Nation, 2024).

9.4.3.3.5.2 Mitigation and Enhancement Measures

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources, will be followed during construction.

A comprehensive list of mitigation measures to limit changes to surface water quantity during construction is provided in the Surface Water Technical Support Document (**Appendix F**).

Mitigation measures to limit changes to surface water quantity are well understood and the methods have been demonstrated to be effective. The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.3.3.5.3 Predicted Residual Effects

As discussed in the Surface Water Technical Support Document (**Appendix F**), Construction and of the Project could result in small, localized changes to surface water quantity. After implementing mitigation, changes to surface water quantity are anticipated to be of negligible magnitude. As such, no net residual effects on wildlife habitat availability and distribution are predicted and this interaction was not carried forward in the assessment.

9.4.3.3.6 Changes to Wildlife resulting to changes in Surface Water Quality

9.4.3.3.6.1 Potential Effects

During construction, surface water may become contaminated if chemicals or substances (for example, petroleum products, sediments, and garbage) from Project

equipment, vehicles, road surfaces, or blasting sites are transported into surface water during precipitation events (Surface Water Technical Support Document; **Appendix F**). This includes contamination of surface water from accidental spills and leaks of chemicals and hazardous materials and wash-off of organic debris during vegetation maintenance activities.

Changes to surface water quality could have negative effects on wildlife habitat availability and distribution.

9.4.3.3.6.2 Mitigation and Enhancement Measures

Mitigation measures during construction of the Project include adherence to federal and provincial regulations and guidelines regarding collection and storage of explosives and solid waste, such as the federal Explosives Act. Additionally, during the winter periods of Construction, sand will be used on the Community Access Road for de-icing instead of road salt, if required. Herbicides or pesticides will not be used at any stage of the Community Access Road construction.

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources, will be followed during construction and operations.

A comprehensive list of mitigation measures to limit changes to surface water quality during construction is provided in the Surface Water Technical Support Document (**Appendix F**). The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.3.3.6.3 Predicted Residual Effects

As described in Surface Water Technical Support Document (**Appendix F**), the Construction of the Project is predicted to result in changes to surface water quality that are negligible in magnitude. As such, no net residual effects on wildlife habitat availability and distribution are predicted and this interaction was not carried forward into the residual effects characterization.

9.4.3.3.7 Changes to Wildlife resulting in Changes to Groundwater

9.4.3.3.7.1 Potential Effects

If aggregates are extracted from below the water table at pits or quarries the local groundwater levels would be lowered either by active dewatering or dredging. Active

dewatering of aggregate pits or quarries would likely take place using a sump to collect water in the bottom of the pit or quarry and pumping the water out of the sump to discharge outside the pit / quarry area. Dredging would lower groundwater levels to a lesser degree than dewatering.

Pit dewatering and dredging may result in changes to groundwater levels of more than 50 percent of the natural seasonal variability (in other words, high magnitude effect; Groundwater Technical Support Document [WSP, 2024b]). The lowered water levels in the excavation cause surrounding groundwater at higher levels to flow towards the excavation. The result is an area of lowered ground water levels surrounding the excavation.

Road construction using “floating” techniques to cross areas of peatland will be designed with a pervious road base structure to allow for the flow of groundwater through the road base. However, there is potential for settlement of the road base structure and underlying peat material or sediment accumulation in the road base material to restrict the flow of groundwater. If the groundwater flow is restricted to a substantial degree, then the road may cause a damming effect with elevated groundwater levels on the upgradient side of the road and lowered groundwater levels on the downgradient side.

Settlement of the road base structure and underlying peat material or sediment accumulation in the road base material may result in changes to groundwater quantity that are between 20 percent and 50 percent higher / lower than existing condition values (in other words, medium magnitude effect) (Groundwater Technical Support Document; **Appendix H**).

Alteration of groundwater levels due to Project activities could have negative effects on wildlife habitat availability and distribution. Changes to vegetation communities are anticipated to be of moderate magnitude and probable to occur [Vegetation Technical Support Document (**Appendix J**); Peatlands Technical Support Document (**Appendix I**)].

9.4.3.3.7.2 Mitigation and Enhancement Measures

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, Fisheries and Oceans Canada, and Ontario Ministry of Natural Resources, will be followed during construction.

A comprehensive list of mitigation measures to limit changes to groundwater quality during construction is provided in the Groundwater Technical Support Document (**Appendix H**). The effectiveness of mitigation measures will be evaluated during

construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.3.3.7.3 Predicted Residual Effects

With the implementation of mitigation measures, changes to groundwater regimes will be minimized and impacts to retained vegetation communities and wildlife habitat availability and distribution should be minimal. However, there are still anticipated to be measurable changes to vegetation due to change to groundwater quantity, which are predicted to result in a residual effect on wildlife habitat availability and distribution. As such, this interaction is carried forward to the residual effects characterization.

Pit dewatering and dredging and settlement of the road base structure and underlying peat material or sediment accumulation in the road base material during construction and operations are expected to change groundwater quantity. Effects from changes to groundwater quantity on wildlife habitat quality are predicted to be **probable, irreversible (long term), continuous,** and confined to **the effects assessment Local Study Area**. Effects from changes to groundwater quantity on the ability of the wildlife populations in the effects assessment Regional Study Area to remain self-sustaining and ecologically effective are anticipated to be **negative** but **negligible in magnitude**.

9.4.3.3.8 Changes to Wildlife from Increase in Wildlife Attractants

9.4.3.3.8.1 Potential Effects

An increase in wildlife attractants during construction of the Project could have an adverse effect on the survival and reproduction of wildlife populations in the wildlife effects assessment Local Study Area. Without effective mitigation measures that minimize and manage wildlife attractants, the Project could attract predators (for example, black bears, wolves) to the effects assessment Construction Disturbance Area, which could increase predation pressures on other wildlife and alter predator-prey relationships (Canadian Wildlife Service, 2007; Beckmann and Lackey, 2008).

9.4.3.3.8.2 Mitigation and Enhancement Measures

Mitigations will be implemented to minimize effects from increased wildlife attractants on wildlife survival and reproduction in the wildlife effects assessment Local Study Area during construction.

An Environmental Protection Plan and Waste Management Plan will be developed and implemented that includes policies and actions anticipated to mitigate the attraction of wildlife to the Construction Disturbance Area, particularly near the temporary construction staging areas and temporary construction camps.

During construction, the effects assessment Construction Disturbance Area would be kept clear of attractants such as food scraps and food containers to prevent attracting wildlife. Food wastes and oil products would be incinerated on site or collected and temporarily stored in wildlife-proof containers. The containers would be transported offsite for recycling or disposed at a licensed disposal facility. Potentially toxic materials that attract wildlife would be stored in secure areas inaccessible to wildlife (for example, buildings, storage areas surrounded by wildlife-proof fencing), and toxic materials would be monitored continuously when removed from storage until they are used or returned to storage to prevent wildlife accessing and ingesting the materials. All personnel associated with the Project will be educated on the hazards of littering and feeding wildlife. Littering and the feeding or harassment of wildlife will be prohibited by all Project personnel and is expected to reduce nuisance wildlife in and near the effects assessment Construction Disturbance Area.

The effectiveness of mitigation measures will be evaluated during construction and post-construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.3.3.8.3 Predicted Residual Effects

The implementation of mitigation measures described previously, including effective waste management practices are expected to limit the attraction of wildlife and their predators to the effects assessment Construction Disturbance Area during construction and operation. However, attraction to the Project could still occur. As such, after mitigation, the Project is expected to result in a net residual effect on wildlife survival and reproduction from increased predation and increased wildlife-vehicle collisions associated with attraction to the roadside. Therefore, the potential effect of wildlife attractants is carried forward in the assessment.

Human activity during construction may increase wildlife attractants (smells, garbage, food) in the effects assessment Construction Disturbance Area. Mitigation should limit wildlife attractants and attraction of predators that may use valued components as a prey resource to the Project. However, there is potential that carnivores, including wildlife valued components, may be attracted to the Project during construction, which may affect predator-prey relationships. Effects are predicted to be possible, irreversible, continuous, and confined to the effects assessment Construction Disturbance Area. Effects from wildlife attractants and changes to predator-prey relationships on the ability of wildlife populations within the effects assessment Regional Study Areas to remain self-sustaining and ecologically functional are anticipated to be negative and negligible in magnitude.

9.4.3.3.9 Changes to Wildlife from Blasting and Associated Fly Rock

9.4.3.3.9.1 Potential Effects

During construction, explosives will be used at quarry sites to excavate materials used at certain segments of the Community Access Road route and to remove bedrock or large boulders. Blasting activities produce fly rock that has the potential to strike animals in the vicinity, and cause injury or death. The risk of mortality from being struck by fly rock would be greatest for wildlife who occupy territories that overlap quarry sites where blasting will occur. The risk of mortality from fly rock impact will be localized around pits and quarry sites and specific areas of the Community Access Road that will require blasting. Blasting will be infrequent and will occur over short durations during construction. Given the high level of construction activity that would be occurring in the area prior to the blast, wildlife are expected to avoid the immediate area.

The potential effects on wildlife from the sensory disturbances associated with blasting during construction are addressed separately under Sensory Disturbance.

9.4.3.3.9.2 Mitigation and Enhancement Measures

A comprehensive list of mitigation measures that will be implemented during construction is provided in Acoustic and Vibration Technical Support Document (**Appendix P**). These measures will be implemented to minimize effects from blasting and associated fly rock on wildlife survival and reproduction in the wildlife effects assessment Local Study Area during construction.

The presence of operating equipment, people, noise, and lights during construction is expected to result in avoidance of blasting areas in the effects assessment Construction Disturbance Area by most wildlife. An Environmental Protection Plan and Blasting Management Plan will be developed and implemented that includes policies and actions for avoiding and minimizing the risks of blasting and blasting materials to wildlife. Industry best practices will be used for blasting activities, including adherence to Ontario Provincial Standard Specification 120 and NPC-119 (Acoustic and Vibration Technical Support Document; **Appendix P**). Blasting will be completed as quickly as possible to shorten the duration of disturbance. Open excavations and blasting areas will be fenced off if left unsupervised to avoid injury and mortality of wildlife. A buffer zone will be placed around the perimeter of blasting activities and surrounding forested habitat. The buffer size will be determined in the Blasting Management Plan.

Quarry blasting, rock crushing and screening, the use of heavy equipment, and other activities that generate loud noises should be avoided in the denning period where feasible and will not be permitted within four kilometres of confirmed or suspected

wolverine den sites during the wolverine denning season (January 15 to May 31). If adherence t the timing windows and restrictions is not possible an authorization under the *Endangered Species Act* / Species Conservation Act may be required. The owner / operator will be responsible for developing site specific mitigation and monitoring in consultation with qualified biologist and appropriate regulatory agencies. The owner / operator will be responsible for obtaining permits necessary to carry out their proposed approach.

The two suspected den sites will continue to be considered den sites for wolverine during the development of the Project unless additional surveys are conducted that determine that wolverines are likely not in these areas. A four-kilometre buffer will be applied to these areas, within which no construction activities will be conducted during the denning period (January 15 to May 31), unless authorized under the *Endangered Species Act* or future Species Conservation Act.

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources, will be followed during construction and operations.

The effectiveness of mitigation measures will be evaluated during construction and, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.3.3.9.3 Predicted Residual Effects

Due to the infrequent timing of blasting, and with the implementation of mitigation, blasting and fly rock from the Project during construction is not expected to result in injury or mortality of wildlife. There is no effect predicted for this Project–environment interaction on wildlife survival and reproduction. Therefore, this interaction was not carried forward in the assessment.

9.4.3.3.10 Changes to Wildlife from Chemical or Hazardous Material Spills

9.4.3.3.10.1 Potential Effects

During construction of the Project, there is the potential for accidental spills of fuels and other materials resulting in the release of deleterious substances and soil contamination from malfunctions of equipment such as hydraulic and fluid leaks, spills during equipment or vehicle refuelling, and from vehicle accidents. Chemical or hazardous material spills (for example, petroleum products) can have detrimental effects on the biodiversity in the affected area (for example, negative effects on vegetation growth, soil

quality, consumption by wildlife and potential for bioaccumulation of contaminants). Spills that occur in high enough concentrations can contaminate soils and affect aquatic organisms, soil organisms, vegetation, and wildlife. Chemical spills can also affect wildlife survival and reproduction if direct exposure to the chemical (for example, ingestion of contaminated water or vegetation) results in acute or chronic illness or death. As a result, there is potential that the Construction of the Project could cause chemical / hazardous material spills that could negatively affect the survival and reproduction of wildlife populations in the effects assessment Local Study Area.

9.4.3.3.10.2 Mitigation and Enhancement Measures

Mitigation measures described in the Surface Water Technical Support Document (**Appendix F**), Groundwater Technical Support Document (**Appendix H**), Physiography, Terrain, and Soils Technical Support Document (**Appendix N**), and Vegetation Technical Support Document (**Appendix J**) will be implemented to minimize effects from chemical and hazardous material spills in the wildlife effects assessment Local Study Area during construction.

Mitigations during construction include adherence to federal and provincial regulations and guidelines regarding fuel and residue, chemical product, petroleum product, and hazardous substance collection and storage, use and handling, and disposal and treatment, such as the federal *Transportation of Dangerous Goods Act*, the Ontario *Dangerous Goods Transportation Act*, and the Ontario *Environmental Protection Act*. Training of personnel will be provided in relation to safe handling of chemicals and hazardous materials. Adverse effects on wildlife survival from spills will be avoided by appropriate handling and transportation of chemicals, fuel, and hazardous materials, secondary containment of fuel tanks, inspection of equipment for leaks and accordance with the Clean Equipment Protocol for Industry (Halloran et al., 2013). An Environmental Protection Plan and a Spill Prevention and Emergency Response Plan will describe specific measures to decrease the risk of an accidental spill occurrence and timely clean-up if a spill were to occur.

9.4.3.3.10.3 Predicted Residual Effects

Effective implementation of the mitigation measures described previously are anticipated to minimize the frequency, spatial extent, and severity of spills. Effects on wildlife from spills in the Project footprint are anticipated to be unlikely due to the implementation of the mitigation measures and are not expected to result in measurable environmental changes and were determined to have no residual effect on wildlife survival and reproduction. Therefore, this potential effect (chemical or hazardous material stored on the Project footprint, or spills can adversely affect wildlife survival and reproduction) is not carried forward to the residual effects characterization.

9.4.3.3.11 Changes to Bats (Little Brown Myotis and Northern Myotis)

9.4.3.3.11.1 Potential Effects

Habitat Loss and Alternation

Habitat Availability

Habitat loss or alteration of hibernacula are not expected as there were no features with potential to support overwintering identified in the study areas. It is anticipated that clearing and grubbing of the Effects Construction Disturbance Area during construction will result in a loss of summer roosting habitat for bats, including little brown myotis and northern myotis maternity roosting habitat. The potential for habitat loss is highest when construction activities remove or damage trees in mature forest stands. Older deciduous trees such as birch and trembling aspen may contain large cavities that are suitable maternal roosts for myotis species, though these animals may roost in snags in both deciduous and conifer stands. The loss of roosting habitat associated with the Project is permanent and long-term for the 60 metre road right-of-way that will be maintained during construction, and temporary for additional areas of the Construction Disturbance Area (in other words, 40 metres of the 100 metre right-of-way, laydown areas, construction camps, temporary access roads).

The Project is predicted to remove 694 hectares of suitable maternity roost habitat for little brown myotis and northern myotis.

Within the effects assessment Local Study Area, approximately 3.95 percent (5,877 hectares) of the mapped area was identified as suitable maternity roost habitat for little brown myotis and northern myotis. The general habitat model predicted that the Project will remove 694 hectares of suitable maternity roost habitat, which is 11.81 percent and 2.59 percent of maternity roost habitat that is present in the effects assessment Local Study Area and effects assessment Regional Study Area respectively under existing conditions.

Both little brown and northern myotis species hibernate in caves and abandoned mining infrastructure. There is limited potential hibernaculum habitat in the Regional Study Area, and the Project is not expected to disturb any hibernacula.

during construction, an effect of habitat alteration on the availability of bat roosting and foraging habitat may be present beyond the effect of direct habitat loss. Areas where maternity roost habitat is lost during clearing and grubbing may become used by bats as foraging habitat. A total of 60 metres of the 100 metre wide right-of-way will be permanently disturbed and maintained clear of mature trees that bats may use as roosting habitat, but temporary construction infrastructure (in other words, temporary

laydown areas, construction camps, and temporary access roads), will be actively restored. However, mature trees suitable as roost habitat may take up to 80 years to reestablish (Ministry of Natural Resources and Forestry, 2017). This regenerating habitat may also be used by bats as foraging habitat.

Distribution

Habitat loss or alteration of hibernacula are not expected as there were no features with potential to support overwintering identified in the study areas. The Project is expected to affect bat maternity roost habitat distribution and connectivity in the effects assessment Local and Regional Study Area. However, the occurrence of suitable roosting habitat in the area is limited. As such, individuals returning during maternity roosting that previously used habitats in the effects assessment Construction Disturbance Area are expected to establish roosts in suitable habitat outside of the effects assessment Construction Disturbance Area. Small, localized effects on bat maternity roosting habitat distribution will occur from the loss of roosting habitat as a result of temporary construction infrastructure development, or the permanent loss of roosting habitat from maintaining a cleared corridor for the Project.

While clearing and grubbing will make habitat unsuitable as roosting habitat, the new clearings and edge habitats may be used by bats as foraging habitat. This is anticipated to alter the distribution of bats and their habitat within the effects assessment Local Study Area as foraging is likely, but roosting opportunities within the effects assessment Construction Disturbance Area will be lost.

The alteration of habitat within the effects assessment Construction Disturbance Area is continuous and permanent along the 60-metre wide road right-of-way and other permanent maintenance infrastructure, and continuous and temporary around temporary construction infrastructure. The Project will create a long, continuous linear feature surrounded by edge habitat, which may be used as foraging habitat by bats. Little brown myotis and northern myotis are predicted to fly directly over or along the Project footprint when dispersing or searching for food and water (Kalcounis-Ruepell et al., 2013).

Although roost fidelity may be higher in areas where suitable roosts are limited, bats (Chiroptera) that roost in tree cavities have less fidelity to roost sites, than species that roost in buildings or caves (Holroyd et., 2023; Lewis, 1995). The ephemeral nature of natural roosts necessitates bat populations that roost in natural habitat to continually adapt to the changing distribution of roost trees. As such, the removal of potential maternity roost trees during the Construction stage is not anticipated to result in a measurable change to little brown myotis maternity habitat distribution.

The Project is predicted to not have any effect on connectivity among populations that overlap with the effects assessment Regional Study Area because bats are highly mobile.

Survival and Reproduction

Habitat loss from the Project could affect bat survival and reproduction if individuals return to maternity roosting areas to find habitat removed and subsequently are unable to establish suitable maternity roosts elsewhere or are forced to establish roosts in lower quality habitat. Changes in canopy cover and the introduction of edge habitat may affect foraging by little brown and northern myotis by converting suitable roosting habitat into suitable foraging habitat. Changes in the availability of foraging or roosting habitat are not predicted to cause a change in the abundance of bats within the effects assessment Regional Study Area because bats are highly mobile and cavity tree roosting habitat is ephemeral in nature.

Sensory Disturbance

Habitat Availability

It is expected that most if not all construction activities will be undertaken during daylight hours when bats are roosting and therefore are less affected by anthropogenic noise. Furthermore, the construction noise frequencies are below the frequencies at which little brown myotis and northern myotis are most sensitive. Although both species are moderately tolerant of human disturbance, noise and light near maternity roosting habitat may cause them to avoid, flee, or abandon roosts (Barbour and Davis, 1969; Schaub et al., 2008).

Survival and Reproduction

Myotis species are moderately tolerant of sensory disturbance from human activities, particularly with regard to diurnal noise. Nocturnal light sources or sound from human activities near otherwise suitable roosting habitat may cause myotis species to avoid roosting there or, in the worst case, abandon their roosts.

Sensory disturbance may enhance the effect of the loss or modification of habitat on bat abundance by further decreasing the amount of available roosting or foraging habitat (Claireau et al., 2019). Changes in habitat quality may cause migration into or out of the effects assessment Construction Disturbance Area (Ratcliffe and Dawson, 2003). Changes in animals' energy budgets may decrease their survival or reproductive success (Luo et al., 2015; Ratcliffe and Dawson, 2003).

The Project is not anticipated to disturb any bat hibernacula. The effect of sensory disturbance on the abundance of bats is likely to be limited only to the effects assessment Construction Disturbance Area and its immediate vicinity.

Noise levels (existing conditions + Project) will reach 50 A-weighted decibels at 600 metres from the edge of the effects assessment Construction Disturbance Area during road and bridge construction Noise levels at quarries during construction will reach 50 A-weighted decibels at 1,000 metres from the edge of the effects assessment Construction Disturbance Area (Acoustic and Vibration Environment Technical Support Document [**Appendix P**]

Bats will avoid areas with sensory disturbances exceeding 88 dB (Bennett and Zurcher, 2013). During construction, sensory disturbance will primarily occur during the day; nighttime construction will be limited. Sensory disturbance during construction will occur for relatively short durations at one location (in other words, confined to the start and end of construction of road segment). After construction of a road segment is complete, sensory disturbance at that location will be relatively low until road operations commence.

Incidental Take

Survival and Reproduction

Little brown myotis and northern myotis are protected under the federal *Species at Risk Act* and / or Ontario's *Endangered Species Act* and regulations. These acts protect residences (in other words, roost trees) and individuals of species that are listed as "Extirpated", "Endangered", or "Threatened." Incidental take of little brown myotis or northern myotis may occur during construction if roost habitat is destroyed during the roosting period or if hibernacula are disturbed during the winter. Pups could be lost if clearing and grubbing removes roost habitat during the maternity roosting period, posing the highest risk of incidental take in the Project if insufficiently mitigated. As stated, there was no evidence of a bat hibernaculum found in the study area during existing conditions field surveys and as such hibernacula are not expected to be disturbed during the construction of the Project, but if they are, mortality of bats of all ages is possible.

Collisions with Vehicles and Equipment

Although bat mortalities from collisions with vehicles and equipment are poorly documented, bats, including little brown myotis, are killed by vehicles with some regularity, (Russell et al., 2009). On the Project, it is anticipated that bats may use the open areas and edge habitat created by the cleared road right-of-way as foraging

habitat which in turn may increase the risk of bat collisions with vehicles. Risks of vehicle and equipment collisions during construction will largely be from vehicles travelling to or leaving site.

9.4.3.3.11.2 Mitigation and Enhancement Measures

Habitat Loss and Alternation

Mitigation measures will be implemented to avoid, minimize, and restore the effects from the Project on bat habitat availability, distribution, and survival and reproduction in the wildlife effects assessment Local Study Area and Regional Study Area. The mitigation measures will apply to all bat species designates as endangered under the *Endangered Species Act*, 2007.

Mitigation measures will include the following:

- Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources;
- Limit the Project footprint to the extent feasible;
- Retain compatible species (for example, shrub vegetation, compatible trees, and coarse woody debris) where practicable and where safe to do so;
- Avoid clearing maternity roost habitat during the bat maternity roosting period (May 1 to September 30). If potential maternity roost habitat is to be removed during the roosting period, it will be subject to *Endangered Species Act*, 2007 permitting requirements and site-specific mitigation measures that would be developed in consultation with the Ministry of the Environment Conservation and Parks, Species at Risk Branch. Mitigation will include pre-clearing surveys to determine if potential maternity roost trees are present in the area to be cleared. All appropriate permits for this work will be acquired in consultation with the Ministry of the Environment Conservation and Parks, Species at Risk Branch;
- Reclaim temporary disturbance areas such as access roads and trails, construction camps, turnaround areas, laydown areas and temporary waterbody crossings at the end of Construction;
- Maintain buffer zones of 30 metres minimum around waterbodies; clearing of riparian vegetation will be limited to the extent practicable and to the requirement of the access road and alignment clearing width only;

- Develop and implement an Environmental Protection Plan and a Cleanup and Reclamation Plan. Where necessary, seedling planting will occur to improve reclamation success on areas of temporary disturbance (for example, temporary access roads, laydown areas, camps, and workspaces) where habitat enhancement is identified. Reclamation plans will be confirmed through engagement with Indigenous communities, the Ministry of Natural Resources, the Ministry of the Environment, Conservation, and Parks Species at Risk Branch, and local foresters. Effectiveness of reclamation efforts will be monitored and managed post-construction, including confirmation that vegetation communities that naturally regenerate (or were planted) are similar to adjacent vegetation communities. If required, adaptive management will be employed to modify or enhance any reclamation efforts; and,
- The effectiveness of mitigation measures will be evaluated during construction and, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Sensory Disturbance

Mitigations outlined in **Table 9.4-9** will be implemented to minimize effects from sensory disturbance on bat habitat availability, distribution, and survival and reproduction in the wildlife effects assessment Local Study Area during construction.

The use of nighttime lighting around bat roosting areas will be minimized to the extent possible during construction. The idling of construction vehicles and equipment will be limited. Night work will be avoided where feasible.

Mitigation measures such as restricting tree clearing within bat maternity roost habitat during the maternity roost season (May 1 to September 30) is expected to avoid and limit sensory disturbance on maternity colonies. If potential maternity roost habitat is to be removed during the roosting period, it will be subject to *Endangered Species Act*, 2007 permitting requirements and site-specific mitigation measures that would be developed in consultation with the Ministry of the Environment Conservation and Parks, Species at Risk Branch. Mitigation will include pre-clearing surveys to determine if potential maternity roost trees are present in the area to be cleared. All appropriate permits for this work will be acquired in consultation with the Ministry of the Environment Conservation and Parks, Species at Risk Branch

Additional mitigation measures include the following:

- Restricting construction traffic to designated areas;

- Restricting access to the Community Access Road corridor during construction, to construction personnel;
- Controlling the lighting required for construction, including direction and timing to avoid effects on bats, while meeting operational health and safety requirements;
- Fitting noise-producing equipment with noise-reducing components, where feasible, and these components will be maintained;
- Construction activities causing loud noises including the use of heavy machinery will not be undertaken adjacent to (in other words, within 50 metres) candidate or confirmed maternity roosts between half an hour before sunset to half an hour after sunrise during the maternity roost season;
- Wildlife awareness training will be provided for road construction workers to reduce vehicle speeds and associated noise and dust emission levels;
- Using industry best practices for blasting activities, including scheduling when in the vicinity of sensitive wildlife sites; and
- Retaining vegetated buffers around pits and quarries to reduce noise, where feasible.

The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Incidental Take

Habitat removal will be minimized to the extent possible. Clearing and grubbing in areas with potential bat roosting habitat will be undertaken outside of the summer roosting period (May 1 to September 30). If clearing or grubbing are required during the summer roosting period, the Ministry of the Environment, Conservation and Park's Species at Risk Branch will be engaged. Depending on the outcome of the discussion with the Ministry of the Environment, Conservation and Park's Species at Risk Branch, additional surveys may be conducted prior to clearing. Surveys would be conducted to search the Construction Disturbance Area for trees that could provide roosts for little brown myotis and northern myotis (candidate roost trees). Candidate roost trees are defined as trees greater than ten centimetres diameter at 1.3 metres above the ground, with exfoliating bark, cracks, crevices, or cavities. Any candidate roost trees will be flagged for avoidance during the summer roosting period.

Clearing will not be undertaken in areas with occupied roosting habitat.

Environmental training for workers will include information on species at risk bat roost identification and procedures to follow if a potential bat roost is identified.

Best management practices and environmental approval conditions, permits, or authorizations issued by the Project will be followed, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.

The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Collisions with Vehicles and Equipment

Mitigations will be implemented to minimize effects from collisions with vehicles and equipment on little brown myotis and northern myotis survival and reproduction in the wildlife effects assessment Local Study Area during construction.

Collision risk during construction will be minimized with implementation of the Environmental Protection Plan, which includes utilizing the Ministry of Transportation's Environmental Guide for Mitigating Road Impacts to Wildlife (2017b) and measures to minimize collisions between wildlife and vehicles during construction. Measures will include an education program that details to staff, owner / operator, and visitors how to take all reasonable precautions to avoid wildlife collisions. In addition, the Environmental Protection Plan will include measures such as:

- Routing the Project to avoid high-quality habitats and sensitive areas, to the extent feasible;
- Avoiding high-quality habitats and sensitive areas for bat species at risk, to the extent feasible;
- Providing wildlife awareness training for road construction workers to reduce vehicle speeds;
- Giving wildlife the right-of-way;
- Signage in areas where wildlife is regularly observed;
- Radio communication between staff of wildlife presence in construction area;
- Coordinating worker transportation to site to reduce traffic volumes;
- Confining vehicle traffic to approved right-of-way, workspace, and access roads;
- Restrictions on the use of motorized recreational vehicles by employees and owner / operator while working, including prohibition of personal snowmobiles, all-terrain vehicles, and other motorized recreational vehicles, except for authorized purposes;
- Mandatory encounter and incident reporting;

- Blocking winter roads and temporary access routes and trails no longer required as construction proceeds; and
- Incorporating standard safe road design configurations and construction methods in the detailed Project design.

The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.3.3.11.3 Predicted Residual Effects

Habitat Loss and Alternation

Suitable roosting habitat within the effects assessment Local and Regional Study Area will be reduced by roughly 694 hectares which corresponds to an 11.81 percent loss and 2.59 percent loss of the available suitable habitat in the respective study areas. Habitat within temporary Construction Disturbance Areas will regenerate and / or be restored after construction; however, mature forest stands recover slowly, making this habitat unsuitable for bat maternity roosting for up to 80 years (Ministry of Natural Resources and Forestry, 2017).

The mitigation measures proposed are anticipated to reduce potential mortality due to clearing and grubbing of suitable roosting habitat to negligible levels.

There is a predicted residual effect of habitat loss after implementation of the mitigation measures described previously. The effect (reduced maternity roost habitat from loss or alteration of vegetation) is carried forward to the characterization of predicted residual effects.

The effect is considered negative, irreversible, continuous, and certain to occur. The direct effect of habitat loss will be confined to the Construction Disturbance Area. The effects of habitat loss and alteration will result in the fragmentation of contiguous habitat. The effects of fragmentation of habitat are predicted to occur at the scale of the Local Study Area.

Effects from habitat loss and alteration on the ability of little brown myotis and northern myotis populations in the wildlife Regional Study Area to remain self-sustaining and ecologically functional are predicted to be **low** in magnitude.

Sensory Disturbance

Sensory disturbance is probable during construction, though mitigation through identifying roosting areas and limiting noise production will reduce this. Bats are moderately tolerant

to sensory disturbance but may avoid the Project area during construction and operations. The effects of sensory disturbance are expected to be medium-term and reversible during construction, continuous, probable, and limited to a local scale. Effects from sensory disturbance on the ability of little brown myotis and northern myotis populations in the wildlife effects assessment Regional Study Area to remain self-sustaining and ecologically functional are predicted to be **negligible** in magnitude.

Incidental Take

Mitigation measures, polices, and practices for construction activities are expected to avoid and limit incidental take of roosting bats relative to existing conditions. However, these measures are not anticipated to eliminate the risk of incidental take, there are residual effects predicted after implementation of the mitigation measures described.

The mitigation measures for construction activities are expected to avoid and limit incidental take of roosting or hibernating bats. Effects from incidental take on the ability of bat populations in the wildlife Regional Study Areas to remain self-sustaining and ecologically functional are predicted to be **negligible** in magnitude.

Collisions with Vehicles and Equipment

Human activity during construction and operation will increase in the effects assessment Construction Disturbance Area. Mitigation is expected to limit collisions with vehicle and equipment during construction. However, there is potential that little brown myotis and northern myotis will be hit by vehicles or equipment during construction and during operations, when mitigations are less enforceable. Because traffic volumes are expected to be higher during daylight hours when bats are not active, bat mortality resulting from vehicle collisions are expected to occur rarely. Effects are predicted to be possible, irreversible, continuous, and confined to the Construction Disturbance Area. Effects from collisions with vehicles and equipment on the ability of the little brown myotis and northern myotis populations in the wildlife effects assessment Regional Study Areas to remain self-sustaining and ecologically functional are predicted to be negative but **negligible** in magnitude.

9.4.3.3.12 Changes to Furbearers (Wolverine)

9.4.3.3.12.1 Potential Effects

Habitat Loss and Alteration

Habitat Availability

Wolverine will directly lose 4,700 hectares of habitat. A conservative assessment has been made by assuming that the entire effects assessment Construction Disturbance

Area (4,700 hectares) is cleared of vegetation. This is a conservative estimate because the Construction Disturbance Area includes temporary features (for example, laydown areas) that may be reclaimed or left to revegetate naturally following construction and areas that may remain intact.

Direct habitat loss for wolverines is due to the footprint of the effects assessment Construction Disturbance Area. The Project activities that contribute to the habitat loss are changes primarily associated with clearing of vegetation and alteration of rock structure and the alteration of habitat for wolverine prey (for example, beaver ponds) within the Construction Disturbance Area. Changes in the distribution of small mammals and birds due to habitat loss may alter foraging opportunities for wolverines, particularly during pregnancy and nursing. Wolverines are habitat generalists occurring in low densities within the wolverine effects assessment Local Study Area and are likely to use much of the terrestrial habitat in the region (Ray et al., 2018; Zigouris et al., 2013). Effects on wolverine habitat availability from the direct loss of habitat is certain during construction.

The Project will remove approximately 4,700 hectares of undisturbed wilderness, and an increase in road density in the area may reduce the quality of some habitat (Dawson et al., 2010). In the wolverine effects assessment Local Study Area, the density of permanent and non-permanent linear disturbances will increase from 0.06 to 0.10 kilometres per square kilometre with the addition of the Project. Dawson et al. (2010) found that maintaining road densities of less than 0.44 kilometres per square kilometre and maintaining large areas of undisturbed habitat for denning sites is particularly important for wolverine population in the central lowland boreal forest. The increase in the linear disturbance density as a result of the Project in the wolverine effects assessment Regional Study Area is predicted to have very little effect on the regional wolverine population.

Wolverines den in areas where boulders or deadfall are prevalent (Magoun and Copeland, 1998; Krebs and Lewis, 2000; Lofroth, 2001; Copeland and Yates, 2006). Loss of denning habitat is possible where these features are to be removed during construction. Loss of habitat through fragmentation is possible starting during construction. Two suspected wolverine denning sites were observed during the aerial wolverine den survey program completed in support of the groundwater drilling program in 2022 and 2023. Both suspected denning sites were located within four kilometres of the Construction Disturbance Area. The aerial wolverine den survey did not provide complete coverage of the wolverine existing conditions Local Study Area. Therefore, these suspected wolverine den sites are likely not the only wolverine den sites located in the wolverine effects assessment Local Study Area.

During construction, the effects assessment Construction Disturbance Area will experience a decrease in canopy cover and change in ground conditions. New edge habitat will surround the corridor and temporary construction infrastructure (in other words, laydown areas, camps, and temporary access roads). Wolverines may use some edge habitat, particularly surrounding quarries and laydown areas for hunting and foraging (Scrafford et al., 2018), though the removal of appropriate structure will make habitat less suitable for denning. Increases in foraging habitat may be counteracted by sensory disturbance.

Distribution

There are minimal existing permanent linear features in the wolverine effects assessment Local Study Area and wolverine effects assessment Regional Study Area. The Community Access Road is approximately 184 km long with most of the road (134 km) stretching north-south and the remaining 49 km stretching east-west to connect with the Marten Falls First Nation. There is potential that the Community Access Road will disrupt or restrict wolverine movements when travelling across the wolverine effects assessment Local Study Area, in both an east-west direction, and in a north-south direction.

Survival and Reproduction

Direct and indirect loss of denning habitat due to the Project may affect wolverine by decreasing reproductive output. The Project will directly remove 4,700 hectares of relatively intact habitat for wolverine which could affect the local survival and reproduction of females with home ranges that overlap the wolverine effects assessment Construction Disturbance Area if individuals are subsequently unable to establish a new denning area or are forced to establish a den site in lower quality habitat. Wolverines den in snow around fallen logs, in snags, in slash piles, or under rocks during the winter season. Kits are born in between mid-February and mid-March and typically reside in maternal dens until the end of April (Ontario Wolverine Recovery Team, 2013). Clearing and grubbing are the construction activities most likely to cause direct habitat loss, but other construction activities such as generating or placing aggregate may also affect available denning areas. Some habitats will regenerate when temporary construction infrastructure such as construction camps, laydown areas, and temporary access roads are decommissioned, although habitat loss along the 60 metre wide road right-of-way itself will be permanent.

Changes to available habitat may also affect the availability of food as well as the energy expenditure of wolverines and affect their survival. Alteration in habitat quality may change wolverine habitat use and distribution. Wolverines are territorial and may

engage in infanticide when unrelated juveniles are on their territories (Persson et al., 2003, 2009). Increased intraspecific competition from changes to wolverine territories may affect survival and reproduction.

Sensory Disturbance

Habitat Availability

Project activities are expected to produce loud noises, light spill, smells, and human activity that could cause wolverine to avoid affected areas, potentially displacing them from suitable habitats for hunting, travel, rest, and denning. The loss or reduction in quality of habitat due to sensory disturbance is likely during construction. Wolverines may avoid areas of human activity (Krebs et al., 2007; Bowman et al., 2010; Fisher et al., 2013; Chow-Fraser et al., 2022), causing them to potentially avoid habitat near the effects assessment Construction Disturbance Area. Wolverines may also abandon dens due to sensory disturbance nearby (Ontario Wolverine Recovery Team, 2013). Therefore, sensory disturbance during the Project construction could result in the indirect loss of suitable wolverine habitat in the wolverine effects assessment Local Study Area if individuals avoid areas with sensory disturbance.

During construction, sensory disturbance will mostly be confined to the active construction site(s) and will occur during the day for short durations spanning the start and end of the construction of each road segment. Once a road segment is constructed, sensory disturbances at that location will be minimal until the operation phase. Unlike the construction of road segments, sensory disturbances at aggregate areas, quarry sites, access roads and construction camps are expected to occur over longer durations throughout construction.

Noise modelling results indicate that Construction of the Project will produce noise levels that exceed daytime noise levels under existing conditions, which was assumed to be 45 A-weighted decibels based on typical noise levels in rural and remote areas as described in the Guidance for Evaluating Human Health Effects in Impact Assessment: Noise (Health Canada, 2023).

Effects from increased noise due to the Project will be constrained to the acoustic and vibration environment Local Study Area, which consists of the area within a 4 kilometres radius around the effects assessment Construction Disturbance Area. Given that construction activities will not occur during nighttime, noise levels are not predicted to exceed the nighttime noise levels under existing conditions (33 A-weighted decibels; Acoustic and Vibration Technical Support Document; **Appendix P**).

Wolverine have been recorded to abandon denning areas due to human related sensory disturbances and avoid habitats near roads (Scrafford and Ray, 2022). The Wildlife Conservation Society Canada recommends an area of concern of 4 kilometres to provide protection to wolverine den sites, foraging, and movement (Scrafford and Ray, 2022). As such, a precise threshold of avoidance by wolverine was set for habitat that falls within 4 km of the Project Construction Disturbance Area. A total of 189,145 hectares of suitable habitat may be indirectly affected because of sensory disturbance within 4 kilometres of the effects assessment Construction Disturbance Area (this excludes the footprint of the Construction Disturbance Area). This is 40.95 percent and 1.17 percent of suitable habitat available in the effects assessment Local Study Area and effects assessment Regional Study Area, respectively.

Distribution

Sensory disturbance from human activity during construction may influence the distribution of wolverines in the Regional Study Area, particularly where the Community Access Road intersects with individual animals' home ranges. Evidence suggests that wolverine respond to anthropogenic developments by changing their distribution. Wolverines are understood to modify their behaviour in response to human activity and may respond by moving through the Regional Study area quickly (Scrafford et al., 2018), alter the areas chosen to build dens (Dawson et al., 2010), modify their dispersal patterns (Sawaya et al., 2019), or avoid the area altogether.

Survival and Reproduction

Sensory disturbance during the Construction of the Project may elicit negative effects on wolverine induced through physiological stress, influencing wolverine movement, hunting and foraging behaviour and choice of denning habitat. In the Red Lake area, wolverines commonly chose denning areas over 5 kilometres from the nearest roads (Scrafford et al., 2018), potentially limiting the reproductive capacity of wolverines in the area. Wolverines may also abandon dens if disturbed during the denning season (Ontario Wolverine Recovery Team, 2013). Sensory disturbance is likely highest during construction of the Project, and may have immediate short-term effects. If wolverines abandon maternal dens during the denning season, the risk of mortality to kits is high, and the increased energy demands related to extra movement may also influence mortality in adults.

Ungulates are an important food resource for wolverines for much of the year, and ungulate species (in other words, caribou and moose) in the effects assessment Regional Study Area are also noted to be sensitive to both sensory disturbance and anthropogenic linear features. Sensory disturbance is likely to be high during

construction and movement of caribou and moose out of the area may decrease the availability of forage to wolverines. Small mammals and birds are important in rearing kits (Magoun, 1987; Copeland, 1996; Landa et al., 1997). Small mammals and other prey resources such as beaver and snowshoe hare may also be affected by the Project, though the effect of the Project on these species is less clear. There may be areas modified during the Project where additional non-animal forage, such as berries that grow well in disturbed environments and edge habitat, may become more abundant. Foraging in the edges of cleared habitat, such as aggregate pits and newly regenerating forest, has been documented (Scrafford et al., 2017). Shifts from higher quality to lower quality food resources in the effects assessment Construction Disturbance Area may affect the energy budget of wolverines, particularly those with home ranges close to the Project. This may influence mortality and reproductive success.

Increase in Predator Access

Distribution

The Project may influence the distribution of wolverine as access to new hunting areas by competitive species changes. It is anticipated that predators such as wolves, black bears, and Canada lynx may have their movement through and presence within the effects assessment Local Study Area increased by the presence of new linear features. These predators will either compete with wolverines for food resources and / or provide carrion foraging opportunities for wolverines. Anthropogenic linear features (in other words, the Community Access Road and temporary access roads) are known to provide movement corridors for wildlife, and recent studies suggest that changes in the movement of coyotes may affect the competitive environment for wolverines (Chow-Fraser et al., 2022).

The effects of the Project on the movement of other wildlife species (in other words, wolves, coyotes), may affect the distribution of wolverines in the study area. If predators or competitive species use either the Community Access Road or associated infrastructure as a movement corridor, wolverine may avoid the area.

Survival and Reproduction

Linear features facilitate predator movement into areas that were previously less accessible (Brody and Pelton, 1989; Jalkotzy et al., 1997; Stuart-Smith et al., 1997; Rettie et al., 1998; James and Stuart-Smith, 2000; Tigner et al., 2014; Dickie et al., 2017, 2020). During construction, changes to the habitat of other wildlife in addition to potential wildlife attractants, may increase the risk for interactions between wolverines and other wildlife species. Wolverines may interact competitively with black bears and coyotes (Chow-Fraser et al. 2022, Ontario Wolverine Recovery Team, 2013), which

may be attracted to construction camps. These interactions may stress wolverines and increase their energy demands, drive wolverines away from otherwise good habitat, or directly cause mortality. With appropriate mitigative measures, these interactions can be minimized, and will mostly be short-term during construction.

Incidental Take

Survival and Reproduction

Incidental take of wolverines may occur during the Project as a result of either the destruction of dens or from collisions with Project vehicles, equipment, or public vehicles using the Community Access Road or associated infrastructure.

Wolverines are sensitive to anthropogenic disturbance during the denning period (Ontario Wolverine Recovery Team, 2013). Anthropogenic sources of mortality are typically additive to natural mortality in wolverines (Krebs et al., 2004). During construction, incidental take is most likely if wolverine dens are removed or disturbed during clearing or grubbing operations. Den abandonment resulting from human disturbance has been reported (Ontario Wolverine Recovery Team, 2013). The destruction or disturbance of maternal dens during the denning season may result in the mortality of kits.

Collisions with Vehicles and Equipment

Survival and Reproduction

The Project has the potential to increase wolverine mortality from collisions with vehicles and equipment.

During construction, public transportation on the Community Access Road will not be permitted. During construction, the risk of vehicle collisions with wolverines is highest on access roads. Temporary sensory disturbance may partially mitigate the risk of vehicle collisions during construction if wolverines avoid the areas of active construction, and further mitigation are predicted to further prevent construction-related vehicle collisions with wolverines.

Collisions with Vehicles and Equipment

Survival and Reproduction

The introduction of the new permanent Community Access Road and access roads associated with the Project are expected to improve the ability of the public to access areas throughout the wolverine effects assessment Local Study Area that has limited access (via roads or trails) under existing conditions. Currently, the wolverine effects

assessment Local Study Area does not have a year-round access road, and only contains a short extent of the winter access road in the southern portion of the study area. The Project proposes to construct a 184 kilometres long Community Access Road, which will provide year-round access throughout the wolverine effects assessment Local Study Area, stretching from Painter Lake Road to the community of Marten Falls. As such, hunting, trapping and recreational opportunities for Indigenous and non-Indigenous land users will increase within and surrounding the wolverine effects assessment Local Study Area (Rempel et al., 1997, Bowman et al., 2010; Brown et al., 2018). Marten Falls First Nation noted that the community used to be known as a community of trappers, and that trapping was a way of life for all Marten Falls First Nation families. Wolverine may be adversely affected by improved public access because this may lead to increased trapping pressures.

9.4.3.3.12.2 Mitigation and Enhancement Measures

Habitat Loss and Alteration

Mitigation measures outlined will be implemented to avoid, minimize, and restore the effects from habitat loss and alteration on wolverine habitat availability, distribution, and survival and reproduction in the wolverine effects assessment Local Study Area and wolverine effects assessment Regional Study Area. Routes selected for the Community Access Road as well as temporary access, laydown areas, camps, and other temporary construction infrastructure will be refined to avoid any potential denning areas to the extent possible. Dust suppression and erosion and sediment control measures will be implemented to avoid disturbance to wolverine habitat outside of construction areas.

A cleared right-of-way width of less that 100 metres will be maintained unless predetermined areas to be required for construction (for example, aggregate sites). Vegetation clearing activities will be limited to the extent necessary for construction. All temporary construction infrastructure will be reclaimed as soon as possible following construction. Buffer zones of 30 metres will be maintained around waterbodies, clearing of riparian vegetation will be limited to the extent practicable and to the requirement of the access road and alignment clearing width only.

An Environmental Protection Plan and a Cleanup and Reclamation Plan will be developed and implemented. Where necessary, seedling planting will occur to improve reclamation success on areas of temporary disturbance (for example, temporary access roads, laydown areas, camps, and workspaces) where habitat enhancement is identified. Reclamation plans will be confirmed through engagement with Indigenous communities, the Ministry of Natural Resources, the Ministry of the Environment, Conservation and Parks Species at Risk Branch and local foresters. Effectiveness of reclamation efforts will be monitored and managed post-construction, including

confirmation that vegetation communities that naturally regenerate (or were planted) are similar to adjacent vegetation communities. If required, adaptive management will be employed to modify or enhance any reclamation efforts.

Areas with potential to support wolverine denning will be identified through a review of plant community mapping and aerial imagery (looking for communities that may contain the microhabitat features such as fallen trees and blowdown, boulders and variable terrain that wolverine require for denning), and targeted aerial site reconnaissance during the same denning period that Construction activities are planned to survey for signs of potential denning areas prior to the initiation of construction activities (for example, clearing and grubbing).

Habitat with the potential to support wolverine denning is widespread in in wolverine effects assessment Local Study Area and includes: all treed plant communities (in other words, forests, swamps, treed peatlands), rock barrens (treed and open), thicket swamps, burned areas, areas of windthrow blowdowns, areas where forestry activities have taken place, lake and watercourse riparian areas, transitions between open peatlands and treed plant communities, and any other areas with topographical changes. The only areas that will not be considered to have potential to support wolverine den sites are the interiors of large, open peatlands, and the interiors of large lakes.

Due to the difficulty in confirming the presence of a wolverine den through aerial surveys, a conservative approach will be taken to the identification of potential wolverine den sites. The positive identification of potential wolverine den site will use a weight of evidence approach and consider several observations including:

- Several wolverine tracks observed in the search area;
- Wolverine tracks concentrated in certain areas; and
- Wolverine tracks observed disappearing into snow covered blowdown or drifts.

The two suspected wolverine den sites observed during the aerial wolverine den survey program completed in support of the groundwater drilling program in 2022 and 2023 will continue to be considered den sites for wolverine during the development of the Project unless additional surveys are conducted that determine that wolverines are likely not denning in these areas.

Clearing and grubbing will be conducted outside of the wolverine natal and maternal denning periods (January 15 through May 31) where suitable denning habitat is identified. If clearing or grubbing must occur in suitable denning habitat during the wolverine denning period, areas will be surveyed prior to construction activities to

search for evidence of potential den sites. The details of the wolverine aerial survey methods will be described in the Environmental Protection Plan. Construction activities will not be conducted within four kilometres of active wolverine den sites during the denning period. An offset plan for Species at Risk including wolverine will be developed to further mitigate the effects of the Project on wolverine.

The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Sensory Disturbance

Mitigation measures will be implemented to avoid, minimize, and restore the effects from sensory disturbance on wolverine habitat availability, distribution, and survival and reproduction in the wolverine effects assessment Local Study Area and wolverine Regional Study Area.

Construction of the Community Access Road will be conducted in phases to limit the amount of disturbance at any particular time. Construction will be completed as quickly as possible to shorten the duration of disturbance. The construction schedule will avoid activities during the sensitive timing windows for wolverine (in other words, wolverine denning season from January 15 to May 31) to the extent practicable. If construction cannot avoid the wolverine denning season, then the Construction Disturbance Area and areas within four kilometres will be monitored for wolverine den sites ahead of construction. Drones or helicopters will be used to survey for wolverine dens sites. The details of the wolverine aerial survey methods will be described in the Environmental Protection Plan. If wolverine den sites are found, a four kilometre buffer will be maintained around the den sites until the end of the denning season. Quarry blasting, rock crushing and screening, the use of heavy equipment, and other activities that generate loud noises will not be permitted within four kilometres of confirmed or suspected wolverine den sites during the wolverine natal and maternal denning seasons.

Progressive reclamation and revegetation will be implemented as non-permanent features will be decommissioned and reclaimed or left to revegetate naturally. Reclaimed temporary use areas will be blocked to avoid re-entry and disturbance of revegetating areas through use of physical control measures (for example, rollback, removal of creek crossings). Restoration on site will consider maintaining or improving wolverine habitat, including planting native trees to accelerate revegetation. An Environmental Protection Plan and Rehabilitation Plan will be developed that includes practices for reclamation. Reclamation plans and practices will be confirmed through

engagement with Indigenous communities, the Ministry of the Environment, Conservation and Parks Species at Risk Branch and local foresters.

Additional mitigation measures include the following:

- Restricting construction traffic to designated areas;
- Restricting access to the Community Access Road corridor during construction, to construction personnel;
- Controlling the lighting required for construction, including direction and timing to avoid effects on wolverine, while meeting operational health and safety requirements;
- Fitting noise-producing equipment with noise-reducing components, where feasible, and these components will be maintained;
- Providing wildlife awareness training for road construction workers to reduce vehicle speeds and associated noise and dust emission levels;
- Using industry best practices for blasting activities, including scheduling when in the vicinity of sensitive wildlife sites;
- Retaining vegetated buffers around pits and quarries to reduce noise, where feasible; and
- Following best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.

Increase in Predator Access

Mitigation measures will be implemented to avoid, minimize, and restore the effects from increase in predator access on wolverine distribution, and survival and reproduction in the wolverine effects assessment Local Study Area and wolverine Regional Study Area. Wildlife attractants will be avoided at work sites, camps, and other locations.

During construction, the ongoing use of inactive areas by predators will be minimized through physical control measures such as rollback, removal of creek crossings, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access. Progressive reclamation and revegetation will be implemented.

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources, will be followed during construction and operations.

Incidental Take

Mitigation measures will be implemented to avoid, minimize, and restore the effects from incidental take on wolverine and survival and reproduction in the wolverine effects assessment Local Study Area and wolverine Regional Study Area.

Effects on den site will be minimized to the extent possible. Areas with potential to support wolverine denning will be identified through a review of plant community mapping (looking for communities that may contain the microhabitat features (for example, fallen trees and blowdown, boulders and variable terrain) that wolverine require for denning), and targeted aerial site reconnaissance during the same denning period that construction activities are planned to survey for signs of potential den sites prior to the initiation of construction activities (for example, clearing and grubbing).

Clearing and grubbing in areas with confirmed or suspected wolverine den sites will take place outside of the wolverine natal and maternal denning seasons (January 15 to May 31). If clearing or grubbing are required during the denning period, surveys for the presence of wolverine den sites will be conducted during the same denning period prior to clearing. Surveys will be conducted from helicopters or drones. The survey extent will include all potentially suitable denning habitat within four kilometres of the disturbance. The methods of the surveys will be determined in consultation with the Ministry of the Environment, Conservation and Parks Species at Risk Branch. The details of the wolverine aerial survey methods will be described in the Environmental Protection Plan.

Clearing will not be undertaken within four kilometres of areas with occupied or suspected wolverine dens. Quarry blasting, rock crushing and screening, the use of heavy equipment, and other activities that generate loud noises will not permitted within four kilometres of confirmed or suspected wolverine den sites during the wolverine denning season. Environmental training for workers will include information on wolverine den identification and procedures to follow if a den site or suspected den site is identified.

If a wolverine den site is identified during construction, Project activity within four kilometres of the den site will stop immediately. Should this timing not be able to be maintained within the buffer widths identified, local Ministry of the Environment, Conservation, and Parks' Species at Risk Branch offices will be contacted to develop a den management plan and appropriate Indigenous communities will be notified as

requested. The Project will avoid activities within four kilometres of the den site during the denning period that would adversely affect wolverine or seek and authorization under the *Endangered Species Act*, 2007 or Species Conservation Act, as appropriate, prior to conduction activities.

Best management practices and environmental approval conditions, permits, or authorizations issued by the Project will be followed, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.

The effectiveness of mitigation measures will be evaluated and mitigation measures will be modified or enhanced as necessary through adaptive management.

Collisions with Vehicles and Equipment

Mitigation measures will be implemented to avoid, minimize, and restore the effects from collisions with vehicles and equipment on wolverine and survival and reproduction in the wolverine effects assessment Local Study Area and wolverine Regional Study Area.

Best management practices and environmental approval conditions, permits, or authorizations issued for the Project will be followed, including those issued by Environment and Climate Change Canada; Ontario Ministry of the Environment, Conservation and Parks; and the Ontario Ministry of Natural Resources.

An Environmental Protection Plan will be developed utilizing the Ministry of Transportation's Environmental Guide for Mitigation Road Impacts to Wildlife (2017a) and that includes the following measures to minimize collisions between wildlife and vehicles during construction and operations: provide driver training to construction and maintenance workers to understand the importance of reducing vehicle speeds, spread awareness of local wildlife, give wildlife the right-of-way, communicate the presence of wildlife along access roads and on site to other employees, and mandatory reporting of wildlife collisions.

Additional mitigation measures will include coordinating worker transportation to the site to reduce traffic volumes; restricting the use of personal snowmobiles, all-terrain vehicles, and other motorized recreational vehicles by employees and owner / operator; and restricting speeding on roads during construction. Construction crews will set speed limits within construction sites and follow those speed limits to decrease the risk of collisions with wildlife, including wolverines.

At watercourse crossings that occur within wolverine high-use areas and are on the north-south segment of the Preferred Route (WA-11, WA-15 and WA-18), modified

bridge and bridge embankments will be designed to incorporate terrestrial pathways adjacent to the aquatic habitat and allow for safe wildlife passage, where feasible given land cover considerations. These design features include increasing the height of bridge to minimum four metres vertical clearance, using natural substrates on the bridge embankments, and allowing for an unobstructed line of sight on either side of the bridge. Wildlife passage modifications to other bridge designs, including bridges that occur on the east-west trending segment of the Community Access Road, will be considered in future design phases.

Collisions with Vehicles and Equipment

Mitigation measures will be implemented to avoid, minimize, and restore the effects from increase in public asses on wolverine and survival and reproduction in the wolverine effects assessment Local Study Area and wolverine Regional Study Area.

Temporary access roads and other temporary Construction infrastructure will be reclaimed as quickly as possible following construction. As part of the reclamation of temporary access roads, access to these roads will be physically blocked to decrease public use. Access roads used for permanent maintenance activities will be blocked while not in use.

An Environmental Protection Plan will be implemented that includes the following measures to control, and / or restrict public use of access roads during construction: speed limits, gates / manned gates, signage, reduced road standard, felling of timber across temporary access roads after reclaimed, removal of temporary watercourse crossings, reduce traffic by locating camps near construction sites. Posting of restricted access and speed signage will follow the Construction Specification for Temporary Traffic Control Devices (OPSS, 2016).

Marten Falls First Nation continues to engage in discussions with the Province regarding the ownership and future operations of the Community Access Road. Access and ownership including gating security / ID system will require further dialogue between the communities and the Province.

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources, will be followed during construction and operations.

9.4.3.3.12.3 Predicted Residual Effects

Habitat Loss and Alteration

The implementation of mitigation measures described above are expected to limit negative effects from habitat loss and alteration on this species in the wolverine effects assessment Local and Regional Study Areas. Wolverine will directly lose 4,700 hectares of habitat. The total direct loss of habitat is much smaller than a single female wolverine home range. However, due to the linear distribution of the disturbance and the fact that wolverines have large home ranges and high daily movement rates, a large portion of the regional population will be affected by habitat loss and alteration resulting from the Project. While the loss of habitat in the wolverine Local Study Area has the potential to affect the home ranges of local individuals, wolverine occupying the wolverine effects assessment Regional Study Area, will still have an amount of undisturbed habitat that remains intact and is anticipated to support a self-sustaining and ecologically functional population.

There are residual effects predicted after implementation of the mitigation measures. After mitigation, the Project is expected to result in a net residual effect on wolverine habitat availability, distribution and survival and reproduction from habitat loss and alteration associated with the construction of the Project. Therefore, the potential effect of habitat loss and alteration is carried forward in the assessment.

Effects from habitat loss and alteration on the ability of the wolverine population in the effects assessment Regional Study Area to remain self-sustaining and ecologically functional are anticipated to be **negative** and **moderate** in magnitude.

Sensory Disturbance

Mitigation measures will reduce the potential effects of sensory disturbance on the survival and reproduction of wolverines in the wolverine effects assessment Regional Study Area but will not completely eliminate the effect of sensory disturbance on the quality of wolverine habitat near the effects assessment Construction Disturbance Area or its effect on the distribution of wolverines in the effects assessment Local Study Area.

Large prey species may move away from the Community Access Road within the effects assessment Regional Study area due to sensory disturbances and changes in the movement of predators. Residual effects, with the exception of changes in the distribution of ungulate prey resources, are expected to be localized to the area surrounding the effects assessment Construction Disturbance Area. There are residual effects predicted after implementation of the mitigation measures.

Effects from habitat sensory disturbance on the ability of the wolverine populations in the wolverine effects assessment Regional Study Area to remain self-sustaining and ecologically functional are anticipated to be **negative** and **moderate** in magnitude.

Increase in Predator Access

Mitigation, particularly of temporary access roads, will reduce but not eliminate the potential for the Project to cause adverse interactions between wolverines and other predatory wildlife. The permanent road will provide a corridor that may be used by wolves and coyotes to occupy areas where they would be competing with wolverines. As mesopredators, coyotes may have a measurable effect on the availability of food for wolverines. Both wolves and coyotes may alter the distribution of prey resources around the effects assessment Construction Disturbance Area. Changes to the movement of wolves and coyotes are expected to decline with distance from the Community Access Road, with the highest level of effect immediately surrounding the Construction Disturbance Area. There are residual effects predicted after implementation of the mitigation measures.

Effects on wolverine survival and reproduction from increased predator access are predicted to be possible, continuous, permanent (permanent access roads) or long term (decommissioned and revegetated access roads) and will be confined to the wolverine effects assessment Local Study Area. Considering that the Project will result in a very small increase in linear feature density in the wolverine effects assessment Regional Study Area (0.04 kilometres per square kilometre), and linear corridors will remain absent or limited in most of the wolverine effects assessment Regional Study Area, effects from increased predator access on the ability of the wolverine population to remain self-sustaining and ecologically functional are anticipated to be negative and **negligible** in magnitude.

Incidental Take

The implementation of mitigation will reduce the risk of incidental take during construction. The incidental take from destroying or disturbing dens will likely happen if construction work is happening in the denning period and dens are not detected prior to construction activities. This is because it may not be possible to detect 100 percent of dens in complex habitats present in the effects assessment Construction Disturbance Area. This could cause a slight increase in wolverine mortality over background levels. There are residual effects predicted after implementation of the mitigation measures.

After mitigation, effects of incidental take are predicted to be possible, medium term and irreversible, infrequent, and confined to the Construction Disturbance Area. Effects from incidental take on the ability of wolverine in the wolverine effects assessment Regional

Study Area to remain self-sustaining and ecologically functional are anticipated to be negative but **low** in magnitude.

Collisions with Vehicles and Equipment

During construction, mitigation measures will likely prevent mortality of wolverines due to road collisions. Vehicle collisions are a potentially persistent source of mortality for wolverines (Krebs and Lewis, 1999; Krebs et al., 2004). As relatively large carnivores with very low reproductive rates and large home ranges, wolverines are expected to be particularly sensitive to road mortality (Rytwinski and Fahrig, 2011). Due to the low density of wolverines in the effects assessment Regional Study Area, and the low reproductive potential of wolverines, mortality of even a small number of females may have negative effects on wolverine survival and reproduction. There are residual effects predicted after implementation of the mitigation measures.

The effects of collisions with vehicles and equipment are predicted to be possible, continuous, permanent and irreversible, and confined to the effects assessment Construction Disturbance Area. After mitigation, the effects from collisions with vehicles and equipment on the ability of the wolverine populations in the wildlife effects assessment Regional Study Areas to remain self-sustaining and ecologically functional are anticipated to be negative and **moderate** in magnitude.

Increase in Public Access

Closure of temporary access roads will help mitigate the effect of increased public access on trapping mortality. Public access will remain increased in areas near the Community Access Road and temporary infrastructure may still provide increased access to people travelling on foot or by all-terrain vehicle, even with the entrances blocked. Any increase in wolverine trapping effort may have a measurable effect on wolverine survival and reproduction. There are residual effects predicted after implementation of the mitigation measures.

The effects of increase in public access are predicted to be possible, continuous, irreversible, and confined to the wildlife effects assessment Local Study Area. After mitigation, the effects from Increase in Public Access on the ability of the wolverine population in the wolverine effects assessment Regional Study Areas to remain self-sustaining and ecologically functional are anticipated to be negative but **moderate** in magnitude.

9.4.3.3.13 Changes to Furbearer (American Marten)

9.4.3.3.13.1 Potential Effects

Habitat Loss and Alteration

Habitat Availability

The Project is expected to affect the quantity and quality of marten habitat in the wildlife effects assessment Local Study Area, which has the potential to adversely affect marten habitat use, and food availability. Direct habitat loss will be contained within the effects assessment Construction Disturbance Area. During construction, the road right-of-way will be cleared of vegetation, which may permanently alter the availability of moderate and high suitability habitat for American martens. Martens do not tend to occupy areas with little to no canopy cover (Cheveau et al., 2013, Naughton, 2012). Some areas cleared for construction will be allowed to regenerate (in other words, temporary access, construction camps, and laydown areas). If these secondary growth areas are replanted and have sufficient complexity, marten will likely continue to use them, though it may take longer than 40 years for these stands to recover (Thompson et al., 2008).

A conservative assessment has been made by assuming that the entire effects assessment Construction Disturbance Area will be cleared of vegetation during construction. Effects on marten habitat availability from the direct loss of moderate to high suitability habitat are certain. Mitigation is expected to reduce the effects on marten habitat availability; however, a loss of approximately 3,627 hectares of moderate to high suitability is predicted to result from the Project during construction.

Direct loss of marten habitat is assumed to be continuous and permanent at the local scale, though some habitat will be restored with the decommissioning of laydown areas and other construction infrastructure.

During construction, particularly during clearing, grubbing, and material placement within the effects assessment Construction Disturbance Area, there will be a loss of complexity in habitat that may potentially be used by American martens. Martens prefer to use mature forest stands with a well-developed understory and are well-adapted to treed environments (Naughton, 2012). Construction will create openings in mature forest that may be less suitable for martens than habitat that was present before Construction. Martens may continue to use edge habitat around cleared areas, but their use will differ from their use of habitat in the area before Construction. If reclaimed, complex habitat preferred by martens may reestablish in areas used for temporary Construction infrastructure, but this will take many years. However, martens are known

to be somewhat resilient to habitat changes, and the Project footprint is of a width that may not affect them at a high level, which may help mitigate the effect.

Distribution

The Project is expected to affect marten habitat distribution and connectivity in the wildlife effects assessment Local Study Area due to fragmentation of suitable habitat and incremental increases in anthropogenic disturbance. Linear features such as roads, trails, and transmission lines may alter the movement of marten within the environment because of habitat fragmentation. Literature sources differ on the extent to which forest openings affect marten movement and habitat connectivity, though it is widely accepted that large expanses of open habitat are rarely traversed by American marten. Expanses of treeless land greater than five kilometres are documented to be an effective barrier to marten dispersal (Buskirk and Ruggiero, 1994). Some studies indicate that marten avoid linear disturbances such as seismic lines (Tigner et al., 2015) and access roads (Robitaille and Aubry, 2000), while others found that marten movement is not impeded by resource roads, trails, and paved highways (Coffin et al., 2002). Sensory disturbance may play a role in the extent to which these features affect marten. The proposed road right-of-way is typically 60-metre wide permanent cleared corridor with locally wider areas where laydown areas, pits and quarries, and other construction infrastructure are located.

Survival and Reproduction

As described under Habitat Availability, the amount of American marten habitat directly removed in the Project will be approximately 3,627 ha. This habitat loss could affect American marten survival and reproduction if individuals cannot find suitable habitat and home ranges elsewhere in the wildlife effects assessment Local Study Area. The amount of habitat affected is roughly equal in size to 36 female home ranges in the region (Thompson and Colgan, 1987). However, the Project is a linear disturbance so it is uncertain how many home ranges will be affected.

Removal of snags, cavity trees, and coarse woody debris that may be used as den sites (Bull et al., 2005) during the clearing and grubbing phase of the Project may affect marten reproduction. Marten kits are born in the early to mid-spring and spend their early lives in maternal dens (Clark et al., 1987, Naughton, 2012). Marten survival may be affected in the clearing and grubbing phase due to the removal of appropriate forest stands that are used for both foraging by American marten as well as for predator avoidance. And as discussed above, reclamation of temporary features is expected to provide functional marten habitat (mature forest with structural complexity) after 70 years or more. Therefore, habitat loss / alteration due to the Project and its effect on

marten survival and reproduction is expected to endure for the long term for the individuals with home ranges that overlap with the Project; however, it is not expected to have a measurable effect on the survival and reproduction of marten at the population level of the wildlife effects assessment Regional Study Area.

Sensory Disturbance

Habitat Availability

Direct effects of sensory disturbance were predicted to reduce the quality of American marten habitat in the effects assessment Local Study Area such that moderate or high-quality habitat may be avoided. Martens may avoid otherwise suitable habitat near areas where work is occurring because of sound and light associated with construction. American martens in the area are not habituated to human activities and there is likely to be an indirect effect of sensory disturbance on marten habitat availability for those individuals whose home ranges overlap the Project footprint. American marten have been found to avoid using suitable habitat within 800 metres from roads (Robitaille and Aubry, 2000). Therefore, it was assumed that habitat found within 800 metres of the Project may be avoided by marten. A total of 22,623 hectares of suitable habitat may be indirectly affected within 800 metres of the effects assessment Construction Disturbance Area due to sensory disturbance inducing habitat avoidance during construction. This represents 15.20 percent and 4.64 percent of moderate to high suitable American marten habitat that is available in the effects assessment Local Study Area and effects assessment Regional Study Area, respectively.

Survival and Reproduction

American martens may increase their movement rates to avoid humans and loud noises during construction of the Project. This increase in movement rate may affect the animals' overall energy budget, though this is unlikely to have a measurable effect on marten who are in good body condition. Avoidance of sensory disturbance may interrupt maternal denning if the disturbance activity occurs in proximity to a den and within the denning window. There is potential that females could abandon dens and potentially kits which will affect marten reproduction success.

Increase in Predator Access

Distribution

During construction, the Project may affect the distribution of other wildlife species, including those that might be predators of or competitors to American marten. Wolves, coyotes, Canada lynx, and black bears may use linear features such as the Community Access Road and temporary access roads as movement corridors and gain easier

access to the effects assessment Local Study Area and habitat used by American martens (Benoit-Pépin et al., 2024). Wildlife attractants present at camps and work sites may also encourage these species to move throughout the construction areas.

Survival and Reproduction

During construction, changes to the habitat of other wildlife in addition to potential wildlife attractants, may increase the risk for interactions between American martens and other wildlife species. American martens may interact competitively with or be eaten by coyotes (Bull and Heater, 2001), species which may be attracted to construction camps. With appropriate mitigative measures, these interactions can be minimized and will mostly be short term during construction.

Incidental Take

Survival and Reproduction

Incidental take of martens may occur during the Project as a result of either the destruction of dens or from collisions with Project vehicles, equipment, or public vehicles using the Community Access Road or associated infrastructure. The pathway of effect of collision with vehicles on marten is discussed further in the next section.

Adverse effects of incidental take can be completely avoided if site preparation occurs outside of the marten denning period from May to July. Should this mitigation be implemented for the Project it would eliminate direct mortality of denning martens during site preparation and construction of the Project. If construction activities were to take place in suitable marten habitat during the denning period, then some incidental take may occur.

Collisions with Vehicles and Equipment

Survival and Reproduction

The Project has the potential to increase marten mortality from collisions with vehicles and equipment. During construction, public transportation on the Community Access Road will not be permitted.

Mitigation implemented with the Project is predicted to reduce direct mortality of American marten from collisions with Project vehicles and equipment. Adverse effects of collision risk, however, cannot be completely removed because vehicle traffic is part of the Project. Mortality of a few individuals over the life of the Project may occur from Project vehicles and equipment.

Increase in Public Access

Survival and Reproduction

The introduction of the new permanent Community Access Road and access roads associated with the Project are expected to improve the ability of the public to access areas throughout the wildlife effects assessment Local Study Area that has limited access (via roads or trails) under existing conditions. Currently, the wildlife effects assessment Local Study Area does not have a year-round access road, and only contains a short extent of the winter access road in the southern portion of the study area. The Project proposes to construct a 184 kilometres long Community Access Road, which will provide year-round access throughout the wildlife effects assessment Local Study Area, stretching from Painter Lake Road to the community of Marten Falls. As such, hunting, trapping and recreational opportunities for Indigenous and non-Indigenous land users will increase within and surrounding the wildlife effects assessment Local Study Area (Rempel et al., 1997, Bowman et al., 2010; Brown et al., 2018). Marten Falls First Nation noted that the community used to be known as a community of trappers, and that trapping was a way of life for all Marten Falls First Nation families American marten may be adversely affected by improved public access because this may lead to increased trapping pressures.

9.4.3.3.13.2 Mitigation and Enhancement Measures

Habitat Loss and Alteration

Mitigation measures will be implemented to avoid, minimize, and restore the effects from the Project on American marten habitat availability, distribution, and survival and reproduction in the wildlife effects assessment Local Study Area and Regional Study Area.

A cleared right-of-way width of 60 metres will be maintained during operation of the road. Vegetation clearing activities will be limited to the extent necessary for construction. All temporary construction infrastructure will be reclaimed as soon as possible following construction. Buffer zones of 30 metres will be maintained around waterbodies, clearing of riparian vegetation will be limited to the extent practicable and to the requirement of the access road and alignment clearing width only. Any American marten dens observed will be marked as sensitive sites and the location buffered appropriately to prevent disturbance as furbearer den sites are protected under the *Fish and Wildlife Conservation Act* 1997 (Government of Ontario, 1997).

An Environmental Protection Plan and a Cleanup and Reclamation Plan will be developed and implemented. Where necessary, seedling planting will occur to improve

reclamation success on areas of temporary disturbance (for example, temporary access roads, laydown areas, camps, and workspaces) where habitat enhancement is identified. Reclamation plans will be confirmed through engagement with Indigenous communities, the Ministry of Natural Resources, and local foresters. Effectiveness of reclamation efforts will be monitored and managed post-construction, including confirmation that vegetation communities that naturally regenerate (or were planted) are similar to adjacent vegetation communities. If required, adaptive management will be employed to modify or enhance any reclamation efforts.

The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Sensory Disturbance

Mitigation measures will be implemented to avoid, minimize, and restore the effects from sensory disturbance on American marten habitat availability, and survival and reproduction in the wildlife effects assessment Local Study Area and wildlife Regional Study Area.

The following mitigation measures will reduce the effect of sensory disturbance on American marten:

- Construction traffic will be restricted to designated areas;
- During construction, access to the Community Access Road corridor will be restricted to construction personnel;
- Noise-producing equipment will be fitted with noise-reducing components, where feasible, and these components will be maintained;
- Unnecessary idling of vehicles and equipment will be limited on Construction sites;
- Industry best practices will be used for blasting activities, including scheduling when in the vicinity of sensitive wildlife sites;
- Forest buffers will be retained around quarries to reduce noise, where feasible.
- American marten dens observed will be marked as sensitive sites and the location buffered appropriately to prevent disturbance as furbearer den sites are protected;
- Speed limits will be enforced at work areas during construction;

- Wildlife awareness training will be provided for road construction workers to reduce vehicle speeds and associated noise and dust emission levels; and
- Best management practices and environmental approval conditions, permits, or authorizations issued for the Project will be followed, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.

Increase in Predator Access

Mitigation measures will be implemented to avoid, minimize, and restore the effects from increase in predator access on American marten distribution, and survival and reproduction in the wildlife effects assessment Local Study Area and wildlife effects assessment Regional Study Area. Wildlife attractants will be avoided at work sites, camps, and other locations.

The Project footprint is designed to limit areas of vegetation clearing and soil disturbance to the extent possible. Existing access roads will be used when available, and temporary activities will be concentrated spatially. Temporary linear features will be designed to decrease predator efficiency, by retaining vegetation under 2 metres, minimizing the width of linear features, and including switch backs and bends in temporary road construction. In addition, best management practices will be implemented during construction to reduce predator mobility when it is safe to do so; for example, only removing snow from access roads when necessary.

During construction, the ongoing use of inactive areas by predators will be minimized through physical control measures such as rollback, removal of creek crossings, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access. Progressive reclamation and revegetation will be implemented as non-permanent features will be decommissioned and reclaimed or revegetated naturally.

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources, will be followed during construction.

Incidental Take

Mitigation measures will be implemented to avoid, minimize, and restore the effects from incidental take on American marten survival and reproduction in the wildlife effects assessment Local Study Area and wildlife effects assessment Regional Study Area.

American marten dens are protected under the Ontario *Fish and Wildlife Conservation Act*, 1997. Efforts will be made to avoid the destruction and disturbance of American marten dens during construction and operations. American marten habitat loss and alteration will be minimized to the extent possible. Information on American marten den identifications and procedures to follow if a den is identified will be included in environmental training for workers. If an active den is identified during construction, including during vegetation removal, work will be stopped, and local Ministry of Natural Resources offices will be contacted immediately. The den will be clearly marked, and a 100 metre buffer around the den will be established. No vegetation removal will be undertaken within the buffer until the Ministry of Natural Resources is engaged.

Best management practices and environmental approval conditions, permits, or authorizations issued by the Project will be followed, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.

The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Collisions with Vehicles and Equipment

Mitigation measures will be implemented to minimize the effects from collisions with vehicles and equipment on American marten survival and reproduction in the wildlife effects assessment Local Study Area and wildlife Regional Study Area.

Best management practices and environmental approval conditions, permits, or authorizations issued for the Project will be followed, including those issued by Environment and Climate Change Canada; Ontario Ministry of the Environment, Conservation and Parks; and the Ontario Ministry of Natural Resources.

An Environmental Protection Plan will be developed utilizing the Ministry of Transportation's Environmental Guide for Mitigating Road Impacts to Wildlife (2017b) and includes the following measures to minimize collisions between wildlife and vehicles during construction and operations: provide driver training to construction and maintenance workers to understand the importance of reducing vehicle speeds, spread awareness of local wildlife, give wildlife the right-of-way, communicate the presence of wildlife along access roads and on site to other employees, and mandatory reporting of wildlife collisions.

Additional mitigation measures will include coordinating worker transportation to the site to reduce traffic volumes; restricting the use of personal snowmobiles, all-terrain

vehicles, and other motorized recreational vehicles by employees and owner / operator; and restricting speeding on roads during construction. Construction crews will set speed limits within construction sites and follow those speed limits to decrease the risk of collisions with wildlife, American marten. Public use of the road will not be allowed during construction.

Increase in Public Access

Mitigation measures will be implemented to avoid, minimize, and restore the effects from increases in public access on American marten survival and reproduction in the wildlife effects assessment Local Study Area and wildlife Regional Study Area.

Access to the Community Access Road corridor will be restricted during construction to construction personnel. Temporary access roads should be gated during use and blocked and restored as soon as possible after they are no longer needed. Permanent access roads used for maintenance activities will be blocked while not in use.

An Environmental Protection Plan will be implemented that includes the following measures to control, and / or restrict public use of access roads during construction: speed limits, gates / manned gates, signage, reduced road standard, felling of timber across temporary access roads after reclaimed, removal of temporary watercourse crossings, reduce traffic by locating camps near construction sites. Posting of restricted access and speed signage will follow the Construction Specification for Temporary Traffic Control Devices (Ontario Provincial Standard Specification, 2016).

Marten Falls First Nation continues to engage in discussions with the Province regarding the ownership and future operations of the Community Access Road. Access and ownership including gating security / ID system will require further dialogue between the communities and the Province.

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources, will be followed during construction and operations.

9.4.3.3.13.3 Predicted Residual Effects

Habitat Loss and Alteration

A permanent loss of 3,627 hectares of the available American marten habitat present in the effects assessment Local and Regional Study Area will occur within the Construction Disturbance Area. Temporary loss of additional habitat may occur during operations if clearing is required for maintenance activities. Marten habitat is not

considered limiting within the effects assessment Local and Regional Study Area. There are residual effects predicted after implementation of the mitigation measures.

After mitigation, the effects from habitat loss and alteration on the ability of the American marten population in the effects assessment Regional Study Area to remain self-sustaining and ecologically functional are anticipated to be **negative** and **low** in magnitude.

Sensory Disturbance

Mitigation will reduce but not eliminate sensory disturbance on American martens during construction, leading to an additional loss of habitat beyond cleared areas. Marten may also have reduced movement across the work area, causing a low degree of fragmentation within the effects assessment Local Study Area. This effect is expected to be temporary during construction, and of low magnitude because of the high availability of suitable habitat present within the effects assessment Local Study Area.

Sensory disturbance will affect American martens with home ranges near the Community Access Road, a relatively small percentage of the martens expected to be present within the effects assessment Local and Regional Study Area. These animals are anticipated to modify their behaviours and habitat use.

The effects of sensory disturbance on American marten are predicted to be probable, continuous, irreversible, and confined to the wildlife effects assessment Local Study Area. Effects from habitat sensory disturbance on the ability of the American marten populations in the wildlife effects assessment Regional Study Area to remain self-sustaining and ecologically functional are anticipated to be **negative** and **low** in magnitude.

Increase in Predator Access

Mitigation, particularly of temporary access roads, will reduce but not eliminate the potential for the Project to increase interactions between American martens and predatory wildlife. The permanent road will provide a corridor that may be used by American marten predators, such as wolves, coyotes, and lynx to occupy new areas. As mesopredators, coyotes may have a measurable effect on the availability of food for mustelids. Both wolves and coyotes may alter the distribution of prey resources around the effects assessment Construction Disturbance Area. Changes to the movement of wolves and coyotes are expected to decline with distance from the Community Access Road, with the highest level of effect immediately surrounding the Construction Disturbance Area. There are residual effects predicted after implementation of the mitigation measures.

Effects on American marten survival and reproduction from increased predator access are predicted to be possible, continuous, permanent (permanent access roads) or long-term (decommissioned and revegetated access roads) and will be confined to the wildlife effects assessment Local Study Area. Effects from increased predator access on the ability of the American marten population to remain self-sustaining and ecologically functional are anticipated to be **negative** and **negligible** in magnitude.

Incidental Take

Mitigation procedures should minimize or eliminate the risk of incidental take of American marten during construction. There are residual effects predicted after implementation of the mitigation measures.

Effects from incidental take are predicted to be possible, medium-term and irreversible, infrequent, and confined to the effects assessment Construction Disturbance Area. Effects from incidental take on the ability of American marten in the effects assessment Regional Study Area to remain self-sustaining and ecologically functional are anticipated to be negative and **low** in magnitude.

Collisions with Vehicles and Equipment

Mitigation will reduce or eliminate the effect from collisions with vehicles and equipment on American marten during construction of the Project. Collisions with vehicles and equipment may affect the survival of some American marten during. Only a very small proportion of the American marten population within the Regional Study Area is likely to be located near the effects assessment Construction Disturbance Area, and collisions with vehicles and equipment are likely to affect only a small number of these animals. There are residual effects predicted after implementation of the mitigation measures.

Effects are predicted to be possible, irreversible, continuous, and confined to the Construction Disturbance Area. Effects from collisions with vehicles and equipment on the ability of the American marten populations in the wildlife Regional Study Areas to remain self-sustaining and ecologically functional are anticipated to be negative but **negligible** in magnitude.

Increase in Public Access

After mitigation, effects from Increase in Public Access on the ability of the American marten population in the wildlife effects assessment Regional Study Areas to remain self-sustaining and ecologically functional are predicted to be negative but **low** in magnitude.

9.4.3.3.14 Changes to Furbearers (Beaver)

9.4.3.3.14.1 Potential Effects

Habitat Loss and Alteration

Habitat Availability

The construction of the Community Access Road and associated Project infrastructure would reduce the availability of suitable beaver habitat. The Project will result in the loss of 855 hectares of moderate to high suitability beaver habitat. The effect on beaver habitat availability from direct loss of suitable habitat are certain.

Beaver habitat loss is mainly associated with the alteration of open water and adjacent predominantly deciduous forest stands. Some areas of the Project footprint may return to moderately suitable beaver habitat because shrubby willow habitats near water features can establish relatively quickly. Moderate and high suitability habitats for beaver include early regenerating ecosites, so functional upland foraging habitat is expected to return in 6 to 20 years following the end of the construction phase for temporarily disturbed areas. At least 40 years from the end of the construction phase would be required for mature forest trees to be established for use in lodges and dams. Beavers are not known to avoid areas occupied by humans, so direct habitat loss is restricted to the effects assessment Construction Disturbance Area.

Temporary construction infrastructure (in other words, laydown areas, camps, and access roads) would be reclaimed; however, vegetation communities in these areas would likely differ from ecosites not influenced by the Project; therefore, effects are considered permanent and irreversible. The Project is not anticipated to extensively disturb wetland ecosystems.

Distribution

Anthropogenic linear features have not been found to decrease the likelihood or occurrence of beaver (Mumma et al., 2018), nonetheless, clearing and grubbing associated with construction will remove beaver forage within the effects assessment Construction Disturbance Area. Removal of food sources may influence beaver distribution by modifying foraging patterns to areas outside of the effects assessment Construction Disturbance Area.

The loss of moderate to high suitability beaver habitat in the effects Construction Disturbance Area is minor compared to the availability of this habitat outside of this area. This is due to the avoidance of wetland habitat for the Project footprint. There is

not anticipated to be a measurable effect on beaver distribution from habitat loss or alteration as a result of construction.

Survival and Reproduction

The Project is expected to remove 855 hectares of moderate to high suitability beaver habitat in the wildlife effects assessment Local Study Area, representing 1.53 percent of the high and moderate suitability habitat currently present in the effects assessment Local Study Area. The loss of high and moderate suitability habitat is approximately equivalent to 86 beaver home ranges in the boreal forest (10 ha; Touihri et al., 2018; Wheatley, 1994). The magnitude of the change in beaver abundance is dependent on how much of this area is currently occupied by beavers. Beavers have high fertility rates and are relatively adaptable and can make use of human-modified habitats (Mumma et al., 2018; Scrafford et al., 2020). The loss of habitat during construction of the Project may have an effect on beaver reproductive success until displaced breeding pairs find new territories / habitats to occupy. Approximately 55,170 hectares of suitable habitat would remain undisturbed in the effects assessment Regional Study Area. Measurable effects on beaver populations are not expected due to direct habitat loss, though any effect would be continuous and permanent.

Sensory Disturbance

Habitat Availability

Sensory disturbance during construction could result in the indirect loss or degradation of suitable beaver habitat if individuals avoid areas with sensory disturbance. However, evidence indicates that beavers have low sensitivity to sensory disturbance and are not expected to experience additional decreases in functional habitat due to the presence of humans, Project infrastructure, and the associated noise and lights (Touihri et al., 2018). Beavers have been recorded to use tail slaps on water to communicate to others of nearby danger (Rosell and Campbell-Palmer, 2022; Miller and Yarrow, 1994), a behaviour often observed in response to sensory disturbance. A precise threshold of avoidance by beavers due to sensory disturbance is not known, habitat that was within 50 metres of the Project was assumed to be negatively affected by sensory disturbance as a precautionary approach. A total of 1,998 hectares of moderate to high suitable habitat may be indirectly affected within 50 metres of the effects assessment Construction Disturbance Area because of sensory disturbance inducing habitat avoidance during construction. This is 1.34 percent and 0.39 percent of suitable habitat that is available in the effects assessment Local Study Area and effects assessment Regional Study Area, respectively, during existing conditions.

Increase in Predator Access

Distribution

During construction, the Project may affect the distribution of other wildlife species, including those that might be predators of beavers. Wolves, coyotes, Canada lynx, and black bears may use linear features such as the Community Access Road and temporary access roads as movement corridors and gain easier access to habitat used by beavers (Benoit-Pépin et al., 2024). Wildlife attractants present at camps and work sites may also encourage these species to move throughout the construction areas.

Survival and Reproduction

During construction, changes to the habitat of other wildlife in addition to potential wildlife attractants, may increase the risk for interactions between beavers and other wildlife species. Beavers may be eaten by coyotes and other predatory species which may be attracted to construction camps. With appropriate mitigative measures, these interactions can be minimized and will mostly be short-term during construction.

Incidental Take

Survival and Reproduction

Incidental take of beaver may occur during the Project as a result of either the destruction of lodges or from collisions with Project vehicles, equipment, or public vehicles using the Community Access Road or associated infrastructure. Ministry of Transportation's Guide of Fisheries – Best Management Practices (2025) will be followed when beaver dams are removed from within a waterbody supporting fish and fish habitat.

Incidental take of beavers during construction could result from the removal of beaver dams or lodges, as well as the accidental destruction of beaver habitat.

Collisions with Vehicles and Equipment

Survival and Reproduction

The Project has the potential to increase beaver mortality from collisions with vehicles and equipment. During construction, public transportation on the Community Access Road will not be permitted. Beavers may cross the road to disperse or access other parts of their habitat. During this time there is a risk of collisions with vehicles or equipment using the road or temporary access roads.

During construction, collisions between Project vehicles and beavers are more likely to occur than collisions with construction equipment, and temporary access roads may pose an increased risk. Mitigation implemented with the Project is predicted to reduce direct mortality of beavers from collisions with Project vehicles and equipment. Adverse effects of collision risk, however, cannot be completely removed because vehicle traffic is part of the Project. Mortality of a few individuals over the life of the Project may occur from Project vehicles and equipment.

Increase in Public Access

Survival and Reproduction

The introduction of the new permanent Community Access Road and access roads associated with the Project are expected to improve the ability of the public to access areas throughout the wildlife effects assessment Local Study Area that has limited access (via roads or trails) under existing conditions. Currently, the wildlife effects assessment Local Study Area does not have a year-round access road, and only contains a short extent of the winter access road in the southern portion of the study area. The Project proposes to construct a 184 km long Community Access Road, which will provide year-round access throughout the wildlife effects assessment Local Study Area, stretching from Painter Lake Road to the community of Marten Falls. As such, hunting, trapping and recreational opportunities for Indigenous and non-Indigenous land users will increase within and surrounding the wildlife effects assessment Local Study Area (Rempel et al., 1997; Bowman et al., 2010; Brown et al., 2018).

9.4.3.3.14.2 Mitigation and Enhancement Measures

Habitat Loss and Alteration

Mitigation measures will be implemented to avoid, minimize, and restore the effects from habitat loss and alteration on beaver habitat availability, distribution, and survival and reproduction in the wildlife effects assessment Local Study Area and wildlife Regional Study Area.

A cleared width of less that 100 metres will be maintained unless otherwise required for operations. Vegetation clearing activities will be limited to the extent necessary for construction. All temporary construction infrastructure will be reclaimed as soon as possible following Construction. Buffer zones of 30 metres will be maintained around waterbodies, clearing of riparian vegetation will be limited to the extent practicable and to the requirement of the access road and alignment clearing width only. Beaver lodges will be marked as sensitive sites and protected. A figure illustrating that location where beaver lodges were observed during existing conditions field surveys will be included in

the Environmental Protection Plan. The Environmental Protection Plan will outline appropriate setbacks and procedures to be followed when beaver lodges are encountered during construction.

Temporary Project infrastructure used during construction only will be reclaimed as soon as possible following Construction. An Environmental Protection Plan and a Cleanup and Reclamation Plan will be developed and implemented. Where necessary, seedling planting will occur to improve reclamation success on areas of temporary disturbance (for example, temporary access roads, laydown areas, camps, and workspaces) where habitat enhancement is identified. Reclamation plans will be confirmed through engagement with Indigenous communities, the Ministry of Natural Resources, and local foresters. Effectiveness of reclamation efforts will be monitored and managed post-construction, including confirmation that vegetation communities that naturally regenerate (or were planted) are similar to adjacent vegetation communities. If required, adaptive management will be employed to modify or enhance any reclamation efforts.

The effectiveness of mitigation measures will be evaluated during construction and, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Sensory Disturbance

Mitigation measures will be implemented to avoid, minimize, and restore the effects from sensory disturbance on beaver habitat availability, and survival and reproduction in the wildlife effects assessment Local Study Area and wildlife Regional Study Area.

The following mitigation measures will reduce the effect of sensory disturbance on beavers:

- Construction traffic will be restricted to designated areas;
- During construction, access to the Community Access Road corridor will be restricted to construction personnel;
- Noise-producing equipment will be fitted with noise-reducing components, where feasible, and these components will be maintained;
- Unnecessary idling of vehicles and equipment will be limited on construction sites;
- Industry best practices will be used for blasting activities, including scheduling when in the vicinity of sensitive wildlife sites;
- Forest buffers will be retained around quarries to reduce noise, where feasible;

- Speed limits will be enforced at work areas during construction;
- Wildlife awareness training will be provided for road construction workers to reduce vehicle speeds and associated noise and dust emission levels; and
- Best management practices and environmental approval conditions, permits, or authorizations issued for the Project will be followed, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.

Increase in Predator Access

Mitigation measures will be implemented to avoid, minimize, and restore the effects from increase in predator access on beaver distribution, and survival and reproduction in the wildlife effects assessment Local Study Area and wildlife effects assessment Regional Study Area. Wildlife attractants will be avoided at work sites, camps, and other locations using mitigation measures.

The Project footprint is designed to limit areas of vegetation clearing and soil disturbance to the extent possible. Existing access roads will be used when available, and temporary activities will be concentrated spatially. Temporary linear features will be designed to decrease predator efficiency, by retaining vegetation under two metres, minimizing the width of linear features, and including switch backs and bends in temporary road construction. In addition, best management practices will be implemented during construction to reduce predator mobility when it is safe to do so; for example, only removing snow from access roads when necessary.

During construction, the ongoing use of inactive areas by predators will be minimized through physical control measures such as rollback, removal of creek crossings, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access. Progressive reclamation and revegetation will be implemented as non-permanent features will be decommissioned and reclaimed or revegetated naturally.

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources, will be followed during construction and operations.

Incidental Take

Mitigation measures will be implemented to avoid, minimize, and restore the effects from incidental take on beaver survival and reproduction in the wildlife effects assessment Local Study Area and wildlife Regional Study Area.

Measures to reduce the need to remove beaver dams and lodges will be employed during construction and will include appropriate screening of culverts to prevent access by beavers, regular monitoring of water crossings for beaver activity, and the early removal of log jams from water crossings and nearby waterways. The loss and alteration of beaver habitat will be minimized to the extent possible and will be undertaken in compliance with the requirements of the *Fisheries Act* (1985). Environmental training for workers will include information on beaver lodge identification and procedures to follow if a lodge is identified. Ministry of Transportation's Guide for Fisheries – Best Management Practices (2025) will be followed when beaver dams are removed within a waterbody supporting fish and fish habitat.

Beaver dams and lodges are protected under the Ontario *Fish and Wildlife Conservation Act*, 1997. If a lodge is identified during construction, (including during vegetation removal), work will be stopped, and local Ministry of Natural Resources offices will be contacted immediately. If a beaver lodge or dam requires removal, an Application to Interfere with / Destroy a Black Bear or Furbearing Mammal Den, Beaver Dam, Black Bear in Den will be submitted to the Ministry of Natural Resources.

Best management practices and environmental approval conditions, permits, or authorizations issued by the Project will be followed, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.

The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Collisions with Vehicles and Equipment

Mitigation measures will be implemented to avoid, minimize, and restore the effects from collisions with vehicles and equipment on beaver survival and reproduction in the wildlife effects assessment Local Study Area and wildlife Regional Study Area.

Best management practices and environmental approval conditions, permits, or authorizations issued for the Project will be followed, including those issued by Environment and Climate Change Canada; Ontario Ministry of the Environment, Conservation and Parks; and the Ontario Ministry of Natural Resources.

An Environmental Protection Plan will be developed utilizing the Ministry of Transportation's Environmental Guide for Mitigating Road Impacts to Wildlife (2017b) and includes the following measures to minimize collisions between wildlife and vehicles during construction and operations: provide driver training to Construction and workers

to understand the importance of reducing vehicle speeds, spread awareness of local wildlife, give wildlife the right-of-way, communicate the presence of wildlife along access roads and on site to other employees, and mandatory reporting of wildlife collisions.

Additional mitigation measures will include coordinating worker transportation to the site to reduce traffic volumes; restricting the use of personal snowmobiles, all-terrain vehicles, and other motorized recreational vehicles by employees and owner / operator; and restricting speeding on roads during construction. Construction crews will set speed limits within construction sites and follow those speed limits to decrease the risk of collisions with wildlife, including beavers. Public use of the road will not be allowed during construction.

Increase in Public Access

Mitigation measures will be implemented to avoid, minimize, and restore the effects from increases in public access on beaver survival and reproduction in the wildlife effects assessment Local Study Area and wildlife Regional Study Area.

Temporary access roads and other temporary Project infrastructure will be blocked at the time of reclamation, preventing access by vehicles. Permanent access roads used for maintenance activities will be blocked while not in use.

An Environmental Protection Plan will be implemented that includes the following measures to control, and / or restrict public use of access roads during construction: speed limits, gates / manned gates, signage, reduced road standard, felling of timber across temporary access roads after reclaimed, removal of temporary watercourse crossings, reduce traffic by locating camps near construction sites. Posting of restricted access and speed signage will follow the Construction Specification for Temporary Traffic Control Devices (Ontario Provincial Standard Specification, 2016).

Marten Falls First Nation continues to engage in discussions with the Province regarding the ownership and future operations of the Community Access Road. Access and ownership including gating security / ID system will require further dialogue between the communities and the Province.

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources, will be followed during construction.

9.4.3.3.14.3 Predicted Residual Effects

Habitat Loss and Alteration

A loss of 855 hectares of suitable beaver habitat will occur during construction. Habitat loss associated with temporary construction infrastructure will regenerate but will remain a medium-term loss. With mitigation, regeneration of appropriate foraging habitat within temporarily cleared areas will be occur faster, minimizing the temporal extent of temporary habitat loss. The permanent loss of habitat represents less than 1.53 percent of the available moderate to high-quality beaver habitat within the wildlife effects assessment Local Study Area, which will have a small effect on habitat availability and is unlikely to have more than a slight effect on beaver populations or distribution in the effects assessment Local Study Area. There are residual effects predicted after implementation of the mitigation measures.

Effects are predicted to be certain, irreversible, and continuous. The direct effect of habitat loss will be confined to the Construction Disturbance Area. The effects of habitat loss and alteration will result in the fragmentation of contiguous habitat. The effects of fragmentation of habitat are predicted to occur at the scale of the Local Study Area.

After mitigation, the effects from habitat loss on the ability of the beaver populations in the wildlife Regional Study Areas to remain self-sustaining and ecologically functional are anticipated to be negative but **negligible** in magnitude.

Sensory Disturbance

Suitable beaver habitat may be indirectly removed or degraded due to sensory disturbance form the Project. However, beavers are known to have low sensitivity to sensory disturbances. While sound and light cannot be completely mitigated during a construction project, only a small proportion of the population of beavers within the effects assessment Regional Study Area are located near the effects assessment Construction Disturbance Area. The implementation of mitigation measures is expected to limit negative effects from sensory disturbance from the Project. However, there are predicted net residual effects on beaver.

Effects are predicted to be possible, continuous, medium-term and reversible during construction, permanent and irreversible during operations, and confined to the wildlife effects assessment Local Study Area. After mitigation, the effects from sensory disturbance on the ability of beaver populations in the wildlife effects assessment Regional Study Areas to remain self-sustaining and ecologically functional are expected to be negative but **negligible** in magnitude.

Increase in Predator Access

Mitigation, particularly of temporary access roads, will reduce the potential for the Project to cause interactions between beavers and other wildlife. The permanent road will provide a corridor that may be used by wolves and coyotes to expand their presence in areas where they would have access to beavers as a prey resource. Both wolves and coyotes may alter the distribution of prey resources around the effects assessment Construction Disturbance Area. Changes to the movement of wolves and coyotes are expected to decline with distance from the Community Access Road, with the highest level of effect immediately surrounding the Construction Disturbance Area. There are residual effects predicted after implementation of the mitigation measures.

Effects are predicted to be irreversible, continuous, and confined to the wildlife effects assessment Local Study Area. After mitigation, the effects from increased predator access on the ability of beaver populations in the wildlife Regional Study Areas to remain self-sustaining and ecologically functional are expected to be negative but **negligible** in magnitude.

Incidental Take

Even with mitigation, there is a potential that beaver dams / lodges may need to be removed for construction or maintenance activities. Dam / lodge removal risks some incidental take, though the portion of the population subject to this risk is only those animals living near the effects assessment Construction Disturbance Area and is relatively small with respect to the effects assessment Regional Study Area. There are residual effects predicted after implementation of the mitigation measures.

With mitigation, incidental take of beavers can be minimized or eliminated.

Effects of incidental take on beavers are predicted to be possible, medium-term and irreversible during construction, permanent and irreversible during operations, infrequent, and confined to the Construction Disturbance Area. After mitigation, the effects from incidental take on the ability of beaver populations in the wildlife effects assessment Regional Study Areas to remain self-sustaining and ecologically functional are expected to be negative but **negligible** in magnitude.

Collisions with Vehicles and Equipment

Mitigation will reduce or eliminate the effect from collisions with vehicles and equipment. on beavers during construction of the Project. Only a very small proportion of the beaver population within the Regional Study Area is likely to be located near the effects assessment Construction Disturbance Area, and collisions with vehicles and equipment

are likely to affect only a small number of these beavers. There are residual effects predicted after implementation of the mitigation measures.

Effects are predicted to be possible, irreversible, continuous, and confined to the Construction Disturbance Area. After mitigation, the effects from collisions with vehicles and equipment on the ability of beaver populations in the wildlife effects assessment Regional Study Areas to remain self-sustaining and ecologically functional are expected to be negative but **negligible** in magnitude.

Increase in Public Access

After mitigation, the effects from increased public access on the ability of beaver populations in the wildlife Regional Study Areas to remain self-sustaining and ecologically functional are expected to be negative but **low** in magnitude.

9.4.3.3.15 Changes to Reptiles and Amphibians

9.4.3.3.15.1 Potential Effects

Habitat Loss and Alteration

Habitat Availability

The effects assessment Construction Disturbance Area is predicted to remove 2,095 hectares of suitable amphibian breeding habitat. It was determined that 72 percent of the effects Local Study Area consists of bogs, fens, marsh land, and swamps, these wetland areas provide important habitat for all life stages of frog species (in other words, spring peeper, boreal chorus frog, northern leopard frog, and mink frog). They are also important breeding habitat for American toad and blue spotted salamander. Effects from habitat loss will begin during construction.

The Project also has the potential to alter upland overwintering habitat for common gartersnakes, a habitat key to its survival during the freezing temperatures in winter. Common gartersnakes often hibernate communally, within a variety of structures including mammal burrows, voids in roost systems, and rock piles and crevices (Rowell, 2012). While Common gartersnakes display fidelity to overwintering sites, the potential habitat is not limiting within the study area.

During construction, habitat alteration will occur with clearing and grading. Large open areas will be formed in the effects assessment Construction Disturbance Area. Habitat alteration of this type will alter the thermal properties within the effects Construction Disturbance Area and thus change the thermoregulatory opportunities for common gartersnakes, thereby increasing the temperatures during hot days in the summer and

likely decreasing the temperatures on cold winter days. The habitat alteration in the effects Construction Disturbance Area may add some opportunities for common gartersnake to forage for frogs and toads, as breeding habitat for amphibians may be created along ditches and through culverts.

Distribution

Habitat for breeding amphibians is common and widespread throughout the effects assessment Local and Regional Study Areas. The loss of amphibian breeding habitat in the effects assessment Construction Disturbance Area is minor compared to the availability of habitat outside of this area. This is due to the avoidance of wetland habitat for the Project footprint.

The Project may cause shifts in the territories of breeding amphibians. Individuals that previously used habitats in the effects assessment Construction Disturbance Area may establish breeding territories in suitable habitat outside of the effects assessment Construction Disturbance Area or may shift their territories away from the effects assessment Construction Disturbance Area. The effects assessment Construction Disturbance Area may act as a barrier to amphibian movements during mating, breeding, foraging and dispersal.

Changes in the vegetation community associated with clearing and grubbing, as well as the placement of aggregate for the Community Access Road will modify the ability of common gartersnakes to thermoregulate and may disrupt the ability of males to follow female scent trails. Gartersnakes have been shown to avoid road surfaces, and crossroads perpendicularly so as to take the shortest route possible (Shine et al., 2004). This disruption will likely cause a long-term change in the distribution and connectivity of common gartersnake habitat during operations, though these effects will be localized to the Community Access Road right-of-way and are unlikely to be measurable within the wildlife effects assessment Regional Study Area.

Direct habitat loss is unlikely to cause a change in the distribution of reptiles and amphibians or the connectivity of their habitat in the effects Local and Regional Study Area. A small amount of habitat fragmentation is expected to result from habitat loss during construction, potentially limiting the movement of reptiles and amphibians across the wildlife effects assessment Construction Disturbance Area.

Survival and Reproduction

While habitat loss within the effects Construction Disturbance Area will displace breeding amphibians, they are anticipated to find other suitable habitat in the wildlife effects Local and Regional Study Areas within which to carry out their key life stages. In

addition to the change in location of some breeding areas, the creation of a road may cause breeding amphibians, particularly those that rely on acoustic communication during breeding, to shift their territories away from the effects assessment Construction Disturbance Area. This in turn may lead to restricted gene flow in areas on either side of the effects assessment Construction Disturbance Area.

Habitat loss within the effects Construction Disturbance Area may affect common gartersnake hibernation or gestation sites. This may affect the survival and reproduction of common gartersnakes; however, the risk of this occurring is low in the context of the effects assessment Local Study Area.

Sensory Disturbance

Habitat Availability

Sensory disturbance during construction could result in the indirect loss or degradation of reptile and amphibian habitat if individuals avoid areas with sensory disturbance. Frogs and toads use acoustic communication during the mating and breeding period to establish territories, find mates, synchronize hatching and facilitate maternal care (Colafrancesco et al., 2016).

The effects of sensory disturbances on reptiles are not well understood and are variable by genus; however, some recent research suggests potential avoidance of anthropogenic noise (Zdenek et al., 2023). Snakes have an acute sensitivity to vibrations. This sensitivity may aid in communication and detection of predators and prey (Christensen et al., 2012). Vibrations caused by Project construction could result in the indirect loss or degradation of habitat if snakes avoid areas where Project related vibrations are present.

A precise threshold of avoidance by reptiles and amphibians due to sensory disturbance is not known. Habitat that was within 50 metres of the Project was assumed to be negatively affected by sensory disturbance as a precautionary approach. A total of 2,092 hectares of suitable habitat may be indirectly affected within 50 metres of the effects assessment Construction Disturbance Area because of sensory disturbance inducing habitat avoidance during construction. This is 1.41 percent and 0.41 percent of suitable habitat that is available in the effects assessment Local Study Area and effects assessment Regional Study Area, respectively, during existing conditions.

Survival and Reproduction

Sensory disturbance (loud noises, lights, smells, dust, and human activity) from the Project may affect reptile and amphibian survival and reproduction through decreased reproductive success. Displaced individuals may have higher energetic costs

associated with movement, meeting their requirements for forage and cover, or finding a mate. A direct effect of sensory disturbance on reptiles and amphibians is plausible if it elicits a stress response. Chronic stress has been shown to reduce growth, survival, and reproduction in wildlife (Wingfield and Sapolsky, 2003), and in some species, it has the potential to result in population-level effects (Dantzer et al., 2014). However, some populations of anurans have shown the ability to habituate to road noise and show reduced stress response to road noise over time (Tennessen et al., 2018). Additionally, sensory disturbance could result in decreased mating success for anurans if calling is reduced or degraded by noise disturbance. Masking of acoustic communication as a result of anthropogenic noise resulting from construction activities and road traffic could lead to missed mating opportunities or reduced quality from mate selection (Zaffaroni-Caorsi et al., 2023). It has been demonstrated that anthropogenic noise can suppress anuran calling behaviour (Sun and Narins, 2005).

Incidental Take

Survival and Reproduction

Incidental take of reptiles and amphibians may occur during the Project as a result of either the destruction of individuals through clearing and grubbing or from collisions with Project vehicles, equipment, or public vehicles using the Community Access Road or associated infrastructure.

Effects of incidental take on survival and reproduction of reptiles and amphibians are likely during construction. Dewatering for construction activities has the potential to result in injury or death to amphibian eggs or tadpoles, and construction equipment poses a risk of enhanced mortality to all reptiles and amphibians, particularly those that move at a slower speed, such as salamanders. Snakes shed their skin multiple times annually. While shedding, snakes have reduced mobility and may be more vulnerable to incidental take during construction (Ministry of Natural Resources and Forestry, 2018). Additionally, common gartersnakes often hibernate communally, within a variety of structures including mammal burrows, voids in roost systems, and rock piles and crevices (Rowell, 2012). Incidental take of multiple eastern gartersnake is possible through the destruction of hibernacula caused by the construction of the Project.

Collisions with Vehicles and Equipment

Survival and Reproduction

Effects on the survival and reproduction of reptiles and amphibians from collisions with vehicles are very likely during construction and were also noted as a concern by Indigenous communities including Métis Nation of Ontario (Métis Nation of Ontario,

2023) and Kashechewan First Nation (MNP LPP, 2024a). The reptiles and amphibians present in the study area are small and slow moving, making them sensitive to incidental mortality from vehicle traffic. Common gartersnakes may also use areas such as roads and other cleared areas for thermoregulation. Across common gartersnake range road mortality is considered the biggest threat to populations (Colino-Rabanal and Lizana, 2012). Due to their preference for upland habitats and the boarders of watercourses and wetlands, the highest mortality rates for common gartersnake are expected to occur in areas where the road right-of-way crossed upland terrestrial habitat adjacent to wetlands and watercourses (Rowell, 2012; Jones et al., 2024).

During construction, public access to the Community Access Road will not be permitted.

Areas with wetland habitat on one or both sides of the road experience high amphibian mortality rates (Colino-Rabanal and Lizana, 2012). Animals moving across the work area will also experience an elevated risk of mortality. Construction may also take place at night while amphibian species are likely to be most active, adding to the risk for these species.

9.4.3.3.15.2 Mitigation and Enhancement Measures

Habitat Loss and Alteration

Mitigation measures will be implemented to avoid, minimize, and restore the effects of habitat loss and alteration from the Project on reptile and amphibian habitat availability, distribution, and survival and reproduction in the wildlife effects assessment Local Study Area and wildlife Regional Study Area.

The following mitigations will be implemented during construction to limit effects from habitat loss and alteration on amphibians and reptiles:

- A cleared width of less than 100 metre will be maintained unless otherwise required for construction;
- Vegetation clearing activities will be limited to the extent necessary for construction;
- All temporary construction infrastructure will be reclaimed as soon as possible following construction;
- Buffer zones of 30 metre will be maintained around waterbodies, clearing of riparian vegetation will be limited to the extent practicable and to the requirement of the access road and alignment clearing width only;
- Additionally, an Environmental Protection Plan and a Cleanup and Reclamation Plan will be developed and implemented;

- Where necessary, seedling planting will occur to improve reclamation success on areas of temporary disturbance (for example, temporary access roads, laydown areas, camps, and workspaces) where habitat enhancement is identified;
- Reclamation plans will be confirmed through engagement with Indigenous communities, the Ministry of Natural Resources and local foresters;
- Effectiveness of reclamation efforts will be monitored and managed post-construction, including confirmation that vegetation communities that naturally regenerate (or were planted) are similar to adjacent vegetation communities; and
- If required, adaptive management will be employed to modify or enhance any reclamation efforts.

Sensory Disturbance

Mitigation measures will be implemented to avoid, minimize, and restore the effects of Sensory Disturbance from the Project on reptile and amphibian habitat availability, and survival and reproduction in the wildlife effects assessment Local Study Area and wildlife Regional Study Area.

The following mitigation measures will reduce the effect of sensory disturbance on reptiles and amphibians:

- Construction traffic will be restricted to designated areas;
- During construction, access to the Community Access Road corridor will be restricted to construction personnel;
- Noise-producing equipment will be fitted with noise-reducing components, where feasible, and these components will be maintained;
- Unnecessary idling of vehicles and equipment will be limited on construction sites;
- Industry best practices will be used for blasting activities, including scheduling when in the vicinity of sensitive wildlife sites;
- Forest buffers will be retained around quarries to reduce noise, where feasible;
- Speed limits will be enforced at work areas during construction;
- Wildlife awareness training will be provided for road construction workers to reduce vehicle speeds and associated noise and dust emission levels; and
- Best management practices and environmental approval conditions, permits, or authorizations issued for the Project will be followed, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.

Incidental Take

Mitigations outlined will be implemented to minimize effects from incidental take on reptile and amphibian survival and reproduction in the wildlife effects assessment Local Study Area during construction.

The following mitigation measures will reduce the effect of incidental take on reptiles and amphibians:

An Environmental Protection Plan will be developed that includes a worker awareness program. These are some additional mitigation measures:

- Construction traffic will be restricted to designated areas.
- Speed limits will be enforced on site during construction activities.
- Any reptiles or amphibians found within work areas will be relocated to suitable habitat nearby. Safe handling practices will be used to move turtles, snakes and other herpetofauna to areas away from the construction (for example, Ontario Species at Risk Handling Manual: For *Endangered Species Act* Authorization Holders).
- Construction personnel will traverse the path of construction equipment, to induce frogs, toads, and snakes to be scared away from the path of oncoming machinery.
- The Project footprint will be limited to the extent feasible; and,
- Calcium salts will not be used for dust control.

The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Collisions with Vehicles and Equipment

Mitigations will be implemented to minimize effects from collisions with vehicles and equipment reptile and amphibian survival and reproduction in the wildlife effects assessment Local Study Area.

An Environmental Protection Plan will be implemented utilizing the Ministry of Transportation's Environmental Guide for Mitigation Road Impacts to Wildlife (2017b) and includes the following measures to minimize collisions between wildlife and vehicles during construction and operations: provide driver training to Construction workers to understand the importance of reducing vehicle speeds, spread awareness of local wildlife, give wildlife the right-of-way, communicate the presence of wildlife along access roads and on site to

other employees, mandatory reporting of wildlife collisions. Appropriate speed limits will be implemented and enforced. Worker transportation to work sites will be coordinated to reduce traffic volumes. Best management practices and environmental approval conditions, permits, or authorizations issued for the Project will be followed.

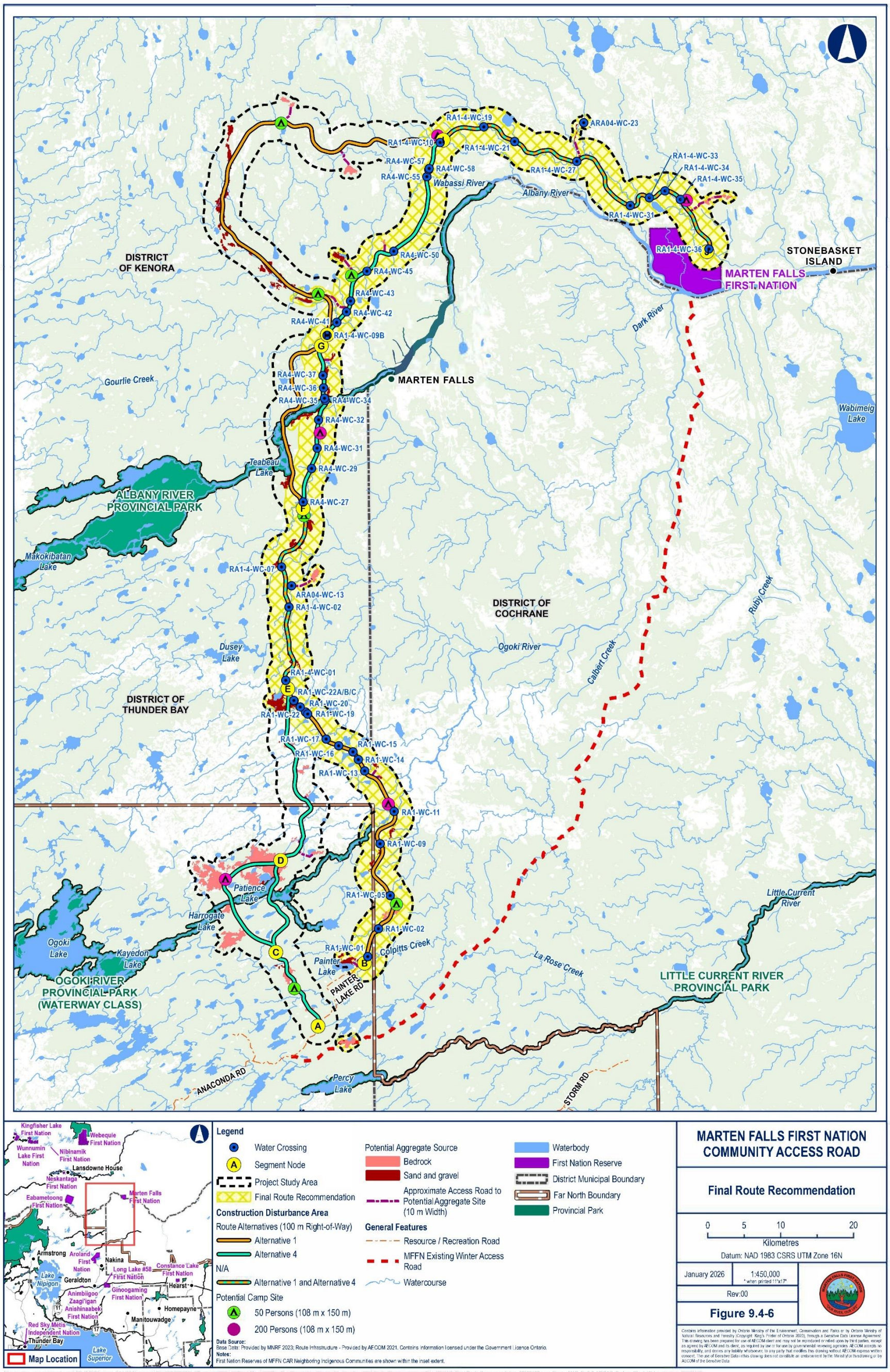
During the next phase of the Project, in the Detail Design stage the incorporation of sub-surface eco-passages and exclusion fencing at strategic locations such as culverts, are predicted to partially mitigate the effect of collisions with vehicles and equipment during operations.

At culvert locations along the north-south segment of the Preferred Route (C-01, WA-03, WA-09, WA-12, WA-13, WA-14, and WA-36), modified culverts will be designed to incorporate safe, sub-surface road passage (**Figure 9.4-6**). All culverts along the north–south portion of the Community Access Road have been identified as priority locations for implementing enhanced culvert designs to reduce road mortality risk due to the presence of amphibian breeding habitat, the present of high-suitability common gartersnake habitat, and the higher traffic volume predicted along this segment compared to the east-west segment of the road. However, subsequent Project design and planning phases will consider similar wildlife passage design modifications at all suitable locations.

Culvert design for the incorporation of sub-surface eco-passage will be implemented to provide safe passage for amphibians and reptiles by installing modified box and corrugated steel pipe or arch culverts. Box culverts will be open bottomed with natural substrates, or standard box culverts with floors embedded in natural, local materials. Corrugated steel pipe culverts will consist of open bottom arch culverts or large round culverts with embedded bottoms to be installed to maintain flat, natural substrates through the crossing. Culverts will include a bench attached to the side wall for dry passage during high-water periods; this bench will be positioned above the high-water mark, will connect to ground level at both ends, and will be at least 50 centimetres wide. Modified culverts will have a minimum openness ratio of 0.1 metres opening to length or greater (in other words, 1 m^2 opening: 10 metres culvert length) for sufficient visibility and encourage wildlife movement through the structure. To guide amphibians and reptiles toward these crossings and prevent them from entering the road, permanent exclusion fencing will be installed and maintained in accordance with the Best Management Practices for Mitigating the Effects of Roads on Amphibian and Reptile Species at Risk in Ontario (Ministry of Natural Resources and Forestry, 2016a). Fence lengths will be determined based on site specific habitat conditions.

Using appropriate design and construction techniques has been shown to demonstrate successful implementation of eco passages as a mitigation strategy (Baxter-Gilbert et al., 2015).

Figure 9.4-6 Final Route Recommendation with Water Crossing Locations



9.4.3.3.15.3 Predicted Residual Effects

Habitat Loss and Alteration

A permanent loss of 2,095 hectares of suitable amphibian breeding habitat is expected, representing about 0.6 percent of the total suitable habitat within the effects assessment Regional Study Area. An effect on reptiles of similar extent is expected. The implementation of mitigation and enhancement measures is expected to limit negative effects. However, there are residual effects predicted after implementation of the mitigation measures.

The effect of habitat loss and alteration is considered negative, irreversible, continuous, and certain to occur. The direct effect of habitat loss will be confined to the Construction Disturbance Area. The effects of habitat loss and alteration will result in the fragmentation of contiguous habitat. The effects of fragmentation of habitat are predicted to occur at the scale of the Local Study Area.

After mitigation, the effects from habitat loss and alteration on the ability of reptile and amphibian populations in the wildlife Regional Study Areas to remain self-sustaining and ecologically functional are predicted to be **low** in magnitude.

Sensory Disturbance

Sound, vibration, and light from construction areas cannot be completely mitigated, and some level of sensory disturbance will still be present during construction. Most reptiles and amphibians are not considered to have high sensitivity to sensory disturbances, and the Construction Disturbance Area covers a relatively small percentage of the Local Study Area. However, sensory disturbance could result in decreased mating success for anurans if calling is reduced or degraded by noise disturbance.

There is a predicted residual effect after the implementation of mitigation measures described previously. Reduced reproductive capacity is possible among affected reptiles and amphibians with breeding habitat within the effects assessment wildlife Local Study Area.

The effect is considered negative, local to the wildlife effects assessment Local Study Area, medium-term and reversible during construction, permanent and irreversible during operations, continuous, and probable to occur. After mitigation, the effects from sensory disturbance during construction of the Project on the ability of reptile and amphibian populations in the wildlife Regional Study Areas to remain self-sustaining and ecologically functional are predicted to be **negligible** in magnitude.

Incidental Take

Mitigation measures will reduce, but likely not eliminate the risk of incidental take of reptiles and amphibians during construction. Effects on mortality will be localized to work areas and transportation corridors and will likely include only a small number of animals.

There is a predicted residual effect after implementation of the mitigation measures.

The effect is considered negative, confined to the Construction Disturbance Area, medium term, infrequent, during construction, and probable to occur. After the implementation of mitigation, the effects from incidental take on the ability of reptile and amphibian populations in the wildlife Regional Study Areas to remain self-sustaining and ecologically functional are predicted to be **low** in magnitude.

Collisions with Vehicles and Equipment

With mitigation, reptile and amphibian mortalities from collisions with vehicles and equipment during construction could be minimized. There is a predicted residual effect after the implementation of mitigation measures described previously.

Implementation of mitigation measures are expected to be effective at minimizing the likelihood of reptile and amphibian collisions with Project vehicles and equipment during construction but are not expected to be as effective during operations because they will be less enforceable amongst public users of the Community Access Road. Because of this, effects are predicted to be probable during construction, irreversible, continuous, and confined to the Construction Disturbance Area. After mitigation, the effects from collisions with vehicles and equipment on the ability of the reptile and amphibian populations in the wildlife effects assessment Regional Study Areas to remain self-sustaining and ecologically functional are anticipated to be negative but **low** in magnitude.

9.4.3.3.16 Changes to Pollinating Insects

9.4.3.3.16.1 Potential Effects

Habitat Loss and Alteration

<u>Habitat Availability</u>

Although all five insect Species at Risk in the effects assessment Regional Study Area are habitat generalists, changes to habitat will occur during construction. Pollinating insects will directly lose 4,695 hectares of habitat. A conservative assessment has been made by assuming that the entire effects assessment Construction Disturbance Area

(4,700 hectares) is cleared of vegetation. Yellow-banded bumblebees will likely lose underground cavities such as abandoned rodent burrows and decomposing logs that are used for nesting during clearing and grubbing (Committee on the Status of Endangered Wildlife in Canada, 2014a, 2015b, 2019). Since Ashton's cuckoo bumble bees and Suckley's cuckoo bumble bees are parasites on other bumble bee species, including yellow-banded bumble bees, they will also lose nesting habitat with these alterations. A loss of leaf litter in the cleared areas of the effects assessment Construction Disturbance Area will also cause a loss of overwintering habitat for all three bee species as well as both lady beetle species.

Distribution

Habitat loss and alteration during construction will affect the distribution of food resources for insects within the effects assessment Construction Disturbance Area. This will affect the distribution of insects on the local scale. Lady beetles are predators on aphids and can be found on a variety of tree and shrub species (Committee on the Status of Endangered Wildlife in Canada, 2016a, b), whereas bumble bees have varied food preferences for flowering plants. Ashton's cuckoo bumble bee prefers flowering plants located near wooded areas (Committee on the Status of Endangered Wildlife in Canada, 2014a), while the yellow banded bumble bee prefers flowering herbs over shrubs (Gibson et al., 2019), and Suckley's cuckoo bumble bee does not collect pollen and eats nectar from the Asteraceae family (Committee on the Status of Endangered Wildlife in Canada, 2019). All species are dependent on plant habitats for foraging and may prefer to move to the edge of the effects assessment Construction Disturbance Area during construction or forage outside of this area.

Survival and Reproduction

Loss of nesting and overwintering habitat could result in lower survival and reproduction of the populations of pollinating insects within the effects assessment Construction Disturbance Area. Some areas cleared for construction will be allowed to regenerate and will likely provide habitat for pollinating insects (in other words, temporary access, construction camps, and laydown areas).

Sensory Disturbance

Habitat Availability and Survival and Reproduction

Sensory disturbance during construction and operations could result in the indirect loss or degradation of suitable pollinator habitat if individuals avoid areas with sensory disturbance. The effects of noise and artificial light on pollinating insects are unknown. There is inconclusive evidence of whether bumble bees and lady beetles are

considered sensitive to anthropogenic disturbances such as noise and light; however, current scientific understanding suggests that further research on the subject is required.

Incidental Take

Survival and Reproduction

Incidental take of pollinating insects may occur during the Project as a result of either the destruction of individuals or bumblebee nest or bumblebee / beetle overwintering habitats through clearing and grubbing or from collisions with Project vehicles, equipment, or public vehicles using the Community Access Road or associated infrastructure.

During construction, incidental take may lead to mortality in pollinating insects if bumblebee nests or bumblebee / beetle overwintering spots are removed, and when insects are affected by vehicles and equipment. Incidental take may also occur intentionally at construction camps if interactions between Project personnel and stinging insects such as bees require nest removals or killing of bees. This is unlikely to have a measurable effect on insect populations in the wildlife effects assessment Regional Study Area.

Collisions with Vehicles and Equipment

Insects may be killed by collisions with vehicles and equipment during construction. Insects that fly through open areas and edge habitat are particularly at risk. Risks are highest on the Community Access Road corridor as well as temporary access roads when vehicles are travelling to or from work areas. Bumble bee queens in particular are more susceptible to road mortalities when they are searching for nest sites in the spring.

During construction, public transportation on the Community Access Road will not be permitted.

9.4.3.3.16.2 Mitigation and Enhancement Measures

Habitat Loss and Alteration

Mitigation measures will be implemented to avoid, minimize, and restore the effects from the Project on pollinating insect habitat availability, distribution, and survival and reproduction in the wildlife effects assessment Local Study Area and wildlife Regional Study Area.

The Project footprint will be limited to the extent feasible. Existing access roads will be used where possible. Decommission and rehabilitate temporary access roads, staging areas, camps, and debris and / or timber stockpiles following construction.

An Environmental Protection Plan and a Cleanup and Rehabilitation Plan will be developed and implemented. Where necessary, seedling planting will occur to improve reclamation success on areas of temporary disturbance (for example, temporary access roads, laydown areas, camps, and workspaces) where habitat enhancement is identified. Rehabilitation plans will be confirmed through engagement with Indigenous communities, the Ministry of Natural Resources and local foresters. Effectiveness of reclamation efforts will be monitored and managed post-construction, including confirmation that vegetation communities that naturally regenerate (or were planted) are similar to adjacent vegetation communities. If required, adaptive management will be employed to modify or enhance any reclamation efforts.

Buffer zones of 30 metres will be maintained around waterbodies, clearing of riparian vegetation will be limited to the extent practicable and to the requirement of the access road and alignment clearing width only.

If seeding is necessary for reclamation of temporary construction infrastructure, a native plant seed mix will be used. Roadside ditches / rights-of-way present a mitigation opportunity for native pollinators. Through establishment of appropriate plant communities and implementation of Integrated Vegetation Management, a suitable forage habitat can be maintained while still performing the safety / functionality of rights-of-way (Wojcik and Buchmann, 2012; United States Environmental Protection Agency, 2008).

The effectiveness of mitigation measures will be evaluated during construction and operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Sensory Disturbance

Mitigation measures will be implemented to avoid, minimize, and restore the effects of sensory disturbance on pollinating insect habitat availability, and survival and reproduction in the wildlife effects assessment Local Study Area and wildlife Regional Study Area.

Although bumble bees and lady beetles may not be considered to be sensitive to sensory disturbances, mitigations for sensory disturbance in other valued components may benefit these species.

The effectiveness of mitigation measures will be evaluated during construction and operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Incidental Take

Mitigation measures will be implemented to avoid, minimize, and restore the effects of incidental take on pollinating insect and survival and reproduction in the wildlife effects assessment Local Study Area and wildlife Regional Study Area.

Measures taken to avoid incidental take of other valued components, including the implementation of speed limits during construction, will likely decrease the incidental take of insects. Prohibiting the use of chemical insecticides and herbicides is expected to reduce incidental take. Restricting the use of chemical salts for dust suppression will further reduce incidental take.

The effectiveness of mitigation measures will be evaluated during construction and operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Collisions with Vehicles and Equipment

Mitigation measures will be implemented to avoid, minimize, and restore the effects of collisions with vehicles and equipment on pollinating insect and survival and reproduction in the wildlife effects assessment Local Study Area and wildlife Regional Study Area.

An Environmental Protection Plan will be implemented utilizing the Ministry's of Transportation's Environmental Guide for Mitigating Road Impacts to Wildlife (2017b) and includes the following measures to minimize collisions between wildlife and vehicles during construction: provide driver training to construction and maintenance workers to understand the importance of reducing vehicle speeds, spread awareness of local wildlife. Appropriate speed limits will be implemented and enforced. Worker transportation to work sites will be coordinated to reduce traffic volumes. Best management practices and environmental approval conditions, permits, or authorizations issued for the Project will be followed.

9.4.3.3.16.3 Predicted Residual Effects

Habitat Loss and Alteration

The Project will result in the removal of 4,700 hectares of mostly undisturbed natural habitat, the majority of which is vegetated and provides suitable nesting, overwintering and foraging resources for pollinating insects. This loss of habitat represents a small

portion of the available habitat within the wildlife effects assessment Regional Study Area. There is a predicted residual effect after the implementation of mitigation measures described previously.

The effect is considered negative, irreversible, continuous, and certain to occur. The direct effect of habitat loss will be confined to the Construction Disturbance Area. The effects of habitat loss and alteration will result in the fragmentation of contiguous habitat. The effects of fragmentation of habitat are predicted to occur at the scale of the Local Study Area.

After mitigation, the effects from habitat loss and alteration on the ability of pollinating insect populations in the wildlife Regional Study Areas to remain self-sustaining and ecologically functional are predicted to be **negligible** in magnitude.

Sensory Disturbance

Bumble bees are tolerant to sensory disturbances such as sound and light but may be sensitive to artificial electromagnetic fields. Lady beetles are not known to be sensitive to sensory disturbances. This effect is expected to have **no** effect on pollinating insects of concern during construction and operations. No residual effect of sensory disturbance on pollinating insects is predicted.

Incidental Take

Mitigation will reduce but not eliminate incidental take. The population of insects within the Construction Disturbance Area is expected to be a small fraction of the insects within the Local Study Area. There are residual effects predicted after implementation of the mitigation measures.

The effect is considered negative, local to the Construction Disturbance area, medium-term and irreversible during construction, permanent and irreversible during operations, infrequent, and probable to occur. After mitigation, the effects from incidental take on the ability of pollinating insect populations in the wildlife effects assessment Regional Study Area to remain self-sustaining and ecologically functional are predicted to be **negligible** in magnitude.

Collisions with Vehicles and Equipment

Insect mortality will occur from collisions with vehicles and equipment during both construction and operations. It is unlikely that a large percentage of the pollinating insects within the effects assessment Regional Study Area will use the Community Access Road and consequently be subject to this risk. There are residual effects predicted after implementation of the mitigation measures.

The effect is considered negative, confined to the Construction Disturbance area, irreversible, continuous, and probable to occur. After mitigation, the effects from collisions with vehicles and equipment on the ability of pollinating insect populations in the wildlife Regional Study Areas to remain self-sustaining and ecologically functional are predicted to be **negligible** in magnitude.

9.4.3.4 Residual Effects – Operations Phase

9.4.3.4.1 Changes to Wildlife through the Introduction and Spread of Invasive Plant Species

9.4.3.4.1.1 Potential Effects

During operations, regular vehicle traffic on the Community Access Road could transport invasive plant seeds or plant parts into the wildlife effects assessment Local Study Area. Effects from the introduction and spread of invasive plants during operations would be the same as for Construction (see section above). If invasive plant species are introduced and spread within the effects assessment Construction Disturbance Area, this could degrade the quality of habitats used by wildlife, ultimately reducing the availability and distribution of suitable habitat during operations.

9.4.3.4.1.2 Mitigation and Enhancement Measures

A list of mitigation measures to control weeds during operations is provided in the Vegetation Technical Support Document (**Appendix J**) and Peatlands Technical Support Document (**Appendix I**). The effectiveness of mitigation measures will be evaluated during operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.3.4.1.3 Predicted Residual Effects

During construction and operations, invasive plant species may occasionally be introduced within the effects assessment Construction Disturbance Area. Best management practices and mitigation measures for controlling the spread of invasive species are well understood and the methods have been demonstrated to be effective. Should invasive plants be introduced from construction vehicles, the plants will be contained and removed quickly resulting in a small, localized effect in the Construction Disturbance Area that is reversible in the short-term and therefore the effect is not predicted to reduce or degrade wildlife habitat. After implementation of mitigation, effects on wildlife valued components from the introduction of invasive plants during operations are predicted to be reversible over the long term and confined to the effects assessment Construction Disturbance Area. During operations, effects are possible and

infrequent. Effects from the introduction of invasive plants on the ability of the wildlife populations in the effects assessment Regional Study Area to remain self-sustaining and ecologically functional are anticipated to be negative but **negligible** in magnitude.

9.4.3.4.2 Changes to Wildlife from Emissions of Criteria Air Contaminants

9.4.3.4.2.1 Potential Effects

During operations, emissions would be generated mainly from the use of fossil fuels associated with vehicle use of the Project and road maintenance (general, seasonal, and special maintenance). As discussed in the Atmospheric Environment Technical Support Document (**Appendix S**), air criteria contaminants were predicted to be below Canadian Ambient Air Quality Standards and / or Ontario Ambient Air Quality Criteria thresholds during operations.

9.4.3.4.2.2 Mitigation and Enhancement Measures

A comprehensive list of mitigation measures that will be implemented to limit air particulate emissions during operations is provided in the Atmospheric Environment Technical Support Document (**Appendix S**).

9.4.3.4.2.3 Predicted Residual Effects

As discussed in the Vegetation Technical Support Document (**Appendix J**) and the Peatlands Technical Support Document (**Appendix I**), emissions of criteria air contaminants are anticipated to have negligible, possible effects on vegetation ecosystems, and, ultimately, wildlife habitat. As such, this interaction was determined to have no residual effects on wildlife habitat availability and distribution and is not carried forward in the assessment.

9.4.3.4.3 Changes to Wildlife from Fugitive Dust Emissions

9.4.3.4.3.1 Potential Effects

Fugitive dust emissions are expected to be produced during operations from activities such as travel on the gravel Community Access Road. Potential effects from fugitive dust emissions on wildlife habitat availability and distribution are outlined in the Construction section above.

During operations, threshold exceedances for the Project are predicted for particulate matter less than 2.5 micrometres, particulate matter less than 10 micrometres and total suspended particulate. The particulate matter less than 2.5 micrometres levels are predicted to reach the 24-hour and annual criteria thresholds at 115 metres and 134 metres from the road, respectively. Levels of particulate matter less than

10 micrometres are predicted to reach the 24-hour threshold at 1,986 metres from the road. Emissions of total suspended particulate total suspended particulate are predicted to reach the 24-hour and annual thresholds at 3,004 metres and 899 metres from the road, respectively.

9.4.3.4.3.2 Mitigation and Enhancement Measures

A Project-specific environmental monitoring program will be developed and will contain mitigation measures to control dust and air emissions during operations. A comprehensive list of mitigation measures that will be implemented to limit dust deposition during operations is provided in the Atmospheric Environment Technical Support Document (**Appendix S**).

9.4.3.4.3.3 Predicted Residual Effects

Although mitigations will be implemented to reduce dust emissions, dust deposition during operations are predicted to degrade vegetation immediately adjacent to the Project and dust deposition is expected over the life of the Project (long term). There are currently no plans to decommission the Community Access Road, therefore, residual effects are largely irreversible. Effects from dust emissions during operations are predicted to be certain, irreversible, continuous, and confined to the wildlife effects assessment Local Study Area. Effects from dust emissions on the ability of the wildlife populations in the wildlife effects assessment Regional Study Area to remain self-sustaining and ecologically functional are anticipated to be negative and **negligible** in magnitude.

9.4.3.4.4 Changes to Wildlife from Erosion and Sedimentation

9.4.3.4.4.1 Potential Effects

Erosion and release of sediments in watercourses and adjacent terrestrial habitat may also occur during operations. Large precipitation events may lead to run-off from the road and sedimentation in low lying areas such as wetland and riparian habitats. Similar to construction, the effects would be localized, intermittent and variable.

9.4.3.4.4.2 Mitigation and Enhancement Measures

An environmental monitoring program will be developed and implemented during Maintenance and will contain mitigation measures to control erosion and sedimentation. Similar to Construction, erosion and sediment control measures will be developed and implemented in accordance with Ontario Provincial Standard Specifications for erosion and sediment control measures (OPSS, 2021a and OPSS, 2021b) during Maintenance. Additionally, mitigation identified in the Ministry of Transportation’s Maintenance Quality

Standards and Maintenance Best Practices for highway maintenance (Ministry of Transportation, 2003) will be implemented to minimize erosion and sedimentation during operations. The mitigation measures established and refined using adaptive management during Project Construction should be maintained during operations.

A comprehensive list of mitigation measures that will be implemented during operations is provided in Vegetation Technical Support Document (**Appendix J**) and Surface Water Technical Support Document (**Appendix F**).

9.4.3.4.4.3 Predicted Residual Effects

Environmental protection and monitoring plans developed for operations are expected to limit erosion and sedimentation. After implementing mitigation, the Project is not predicted to result in residual effects on the condition of peatland, upland, wetland and riparian ecosystems (in other words, wildlife habitat), relative to existing conditions (Vegetation Technical Support Document; **Appendix J**). As such, this interaction was not carried forward in the assessment.

9.4.3.4.5 Changes to Wildlife resulting from changes to Surface Water Quantity

9.4.3.4.5.1 Potential Effects

Removal of forested and peatland habitat during Project Construction, and subsequent conversion of treed and peatland habitats to open or shrubby habitats could result in changes to surface water quantity during operations of the Project (Surface Water Technical Support Document; **Appendix F**). Potential effects from changes to surface water quantity on wildlife habitat availability and distribution are discussed in the Construction section, above.

9.4.3.4.5.2 Mitigation and Enhancement Measures

The mitigation measures established and refined using adaptive management during Project Construction should be maintained during operations. Follow Ontario Provincial Standard Specification 411 and regularly inspect and maintain culverts and bridges. Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, Fisheries and Oceans Canada, and Ontario Ministry of Natural Resources, will be followed during operations.

A comprehensive list of mitigation measures to limit changes to surface water quantity during operations is provided in the Surface Water Technical Support Document (**Appendix F**). The effectiveness of mitigation measures will be evaluated during

operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.3.4.5.3 Predicted Residual Effects

Operations of the Project could result in small, localized changes to surface water quantity. After implementing mitigation, changes to surface water quantity are anticipated to be of negligible magnitude. As such, no net residual effects on wildlife habitat availability and distribution are predicted and this interaction was not carried forward in the assessment.

9.4.3.4.6 Changes to Wildlife resulting from Changes in Surface Water Quality

9.4.3.4.6.1 Potential Effects

During operations, mechanical vegetation maintenance activities along the right-of-way could result in changes to surface water quality. For example, organic debris may be transported to nearby waterbodies, which could increase concentrations of suspended solids in the receiving water (Surface Water Technical Support Document; **Appendix F**). This in turn, can affect the quality of wildlife habitat.

9.4.3.4.6.2 Mitigation and Enhancement Measures

During the winter maintenance periods, sand will be used on the Community Access Road for de-icing instead of road salt, as required. Herbicides or pesticides will not be used at any stage of the Community Access Road. Non-chloride containing compounds will be used for dust suppression on the Community Access Road during operations, as required.

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, Fisheries and Oceans Canada, and Ontario Ministry of Natural Resources, will be followed during operations. During the winter periods, sand will be used on the Community Access Road for de-icing instead of road salt. Herbicides or pesticides will not be used during operations. The mitigation measures established and refined using adaptive management during Project Construction should be maintained during operations.

A comprehensive list of mitigation measures to limit changes to surface water quality during operations is provided in the Surface Water Technical Support Document (**Appendix F**). The effectiveness of mitigation measures will be evaluated during operations and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.3.4.6.3 Predicted Residual Effects

As described in the Surface Water Technical Support Document (**Appendix F**), Operations of the Project is predicted to result in changes to surface water quality that are negligible in magnitude. As such, no net residual effects on wildlife habitat availability and distribution are predicted and this interaction was not carried forward into the residual effects characterization.

9.4.3.4.7 Changes to Wildlife resulting from Changes to Groundwater

9.4.3.4.7.1 Potential Effects

Effects from changes to groundwater levels on wildlife habitat availability and distribution from the potential settlement of the road base structure and underlying peat material, and from potential sediment accumulation in the road base material restricting the flow of groundwater, will continue through Operations of the Project.

9.4.3.4.7.2 Mitigation and Enhancement Measures

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, Fisheries and Oceans Canada, and Ontario Ministry of Natural Resources, will be followed during operations.

As discussed in the Groundwater Technical Support Document (**Appendix H**), the mitigation measures established and refined using adaptive management during Project Construction should be maintained during operations. It is expected that a robust monitoring program will be undertaken, and adaptive management measures implemented, as required. This monitoring program is described in more detail in the Peatlands Technical Support Document (**Appendix I**).

9.4.3.4.7.3 Predicted Residual Effects

With the implementation of mitigation measures, changes to groundwater regimes will be minimized and impacts to retained vegetation communities and wildlife habitat availability and distribution should be minimal. However, there are still anticipated to be measurable changes to vegetation due to change to groundwater quantity, which are predicted to result in a residual effect on wildlife habitat availability and distribution. As such, this interaction is carried forward to the residual effects characterization.

Pit dewatering and dredging and settlement of the road base structure and underlying peat material or sediment accumulation in the road base material during operations are expected to change groundwater quantity. Effects from changes to groundwater

quantity on wildlife habitat quality are predicted to be **probable, irreversible (long term), continuous,** and confined to **the effects assessment Local Study Area**. Effects from changes to groundwater quantity on the ability of the wildlife populations in the effects assessment Regional Study Area to remain self-sustaining and ecologically effective are anticipated to be **negative** but **negligible in magnitude**.

9.4.3.4.8 Changes to Wildlife from Increase in Wildlife Attractants

9.4.3.4.8.1 Potential Effects

As discussed in the Construction section above, wildlife may be attracted to food smells and waste, petroleum-based chemicals, and roadkill during operations. However, the potential of attracting wildlife from food wastes, petroleum products, and gray water and sewage is expected to decrease during operations once the temporary construction camps are decommissioned.

9.4.3.4.8.2 Mitigation and Enhancement Measures

During Operations, inspections of the road and rest areas will occur two days of each week and, based on these inspections, debris and litter will be collected when detected (Ministry of Transportation, 2003). Additionally, Ontario Ministry of Transportation will remove roadkill when reported by drivers on the highway or when observed during the two-time-per-week highway inspections (Ministry of Transportation, 2003). As per the Ministry of Transportation's Debris Control Maintenance Quality Standard (MQS-331), debris less than one metre in diameter, including roadkill, will be removed within 48 hours; debris greater than one metre in diameter will be removed as detected (Ministry of Transportation, 2003). Generally, roadkill will be removed from the effects assessment Construction Disturbance Area and relocated to adjacent brush areas, as per the Waste and Excess Materials Management Environmental Protection (EP-9) requirements in the Ministry of Transportation's Maintenance Manual (Ministry of Transportation, 2003). As per the Waste and Excess Materials Management Environmental Protection requirements in the Maintenance Manual, depending on the location and weather at the time of roadkill removal, burial of small mammals occur in the roadside ditches, if this activity is permitted under a Certificate of Approval for Waste Management System (Ministry of Transportation, 2003).

Rest areas will be available every 50 kilometres along the road during the operation of the road. The rest areas will be staggered every 25 kilometres, alternating on each side of the highway. These rest areas will contain waste receptacles. As per the Ministry of Transportation's Rest Area/Picnic Site Maintenance Best Practice (MBP-325), during the rest areas operating season (in other words, months during the year when temperatures remain above 0°C and closing no sooner than October 15), litter in waste

receptacles will be removed from rest areas when waste receptacles are 75 percent full (Ministry of Transportation, 2003).

9.4.3.4.8.3 Predicted Residual Effects

Human activity during operations may increase wildlife attractants (smells, garbage, food) in the effects assessment Construction Disturbance Area. Mitigation should limit wildlife attractants and attraction of predators that may use valued components as a prey resource to the Project. However, there is potential that carnivores, including wildlife valued components, may be attracted to the Project during construction and operations, which may affect predator-prey relationships. Effects are predicted to be possible, irreversible, continuous, and confined to the effects assessment Construction Disturbance Area. Effects from wildlife attractants and changes to predator-prey relationships on the ability of wildlife populations within the effects assessment Regional Study Areas to remain self-sustaining and ecologically functional are anticipated to be negative and negligible in magnitude.

9.4.3.4.9 Changes to Wildlife from Blasting and Associated Fly Rock

9.4.3.4.9.1 Potential Effects

Explosives may be used at quarry sites to excavate materials to be used for maintenance of the Community Access Road. Blasting activities may produce fly rock that has the potential to strike wildlife in the vicinity and cause injury or death. The risk of mortality from being struck by fly rock would be greatest for wildlife who occupy territories that overlap blasting sites. Blasting will be infrequent during operations, and the risk of mortality to wildlife from fly rock is anticipated to be much lower during operations relative to Construction.

The potential effects on wildlife from the sensory disturbances associated with blasting during operations are addressed separately under Sensory Disturbance.

9.4.3.4.9.2 Mitigation and Enhancement Measures

A comprehensive list of mitigation measures that will be implemented during operations is provided in Acoustic and Vibration Technical Support Document (Appendix P).

During Operations, quarry blasting will be suspended within 4 km of known or potential wolverine denning areas during the denning period to minimize sensory disturbances (January 15 to May 31).

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry

of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources, will be followed during operations.

9.4.3.4.9.3 Predicted Residual Effects

Due to the infrequent timing of blasting, and with the implementation of mitigation, blasting and fly rock from the Project during operations is not expected to result in injury or mortality of wildlife. There is no residual effect predicted for this Project–environment interaction on wildlife survival and reproduction. Therefore, this interaction was not carried forward in the assessment.

9.4.3.4.10 Changes to Wildlife from Chemical or Hazardous Material Spills

9.4.3.4.10.1 Potential Effects

There is the potential for accidental spills of fuels and other materials from vehicles and vehicle collisions during operation of the Preferred Route during the operation phase and from malfunctions of equipment or spills during equipment or vehicle refuelling during Maintenance of the Preferred Route activities. Effects from spills on water, soil, and vegetation quality during the operation phase are the same as discussed in the construction section.

9.4.3.4.10.2 Mitigation and Enhancement Measures

Mitigation measures described in the Surface Water Technical Support Document (**Appendix F**), Groundwater Technical Support Document (**Appendix H**), Physiography, Terrain, and Soils Technical Support Document (**Appendix N**), and Vegetation Technical Support Document (Appendix J) will be implemented to minimize effects from chemical and hazardous material spills in the wildlife effects assessment Local Study Area during operations.

Mitigations during operations include adherence to federal and provincial regulations and guidelines regarding fuel and residue, chemical product, petroleum product, and hazardous substance collection and storage, use and handling, and disposal and treatment, such as the federal *Transportation of Dangerous Goods Act*, the Ontario *Dangerous Goods Transportation Act*, and the Ontario Environment Act. Maintenance owner / operators will receive similar training as Construction owner / operator, described above.

During Operations, mitigations will include a posting and enforcement of a speed limit on the highway, which should reduce potential for chemical or hazardous material spills by reducing vehicle collision risk.

9.4.3.4.10.3 Predicted Residual Effects

Effective implementation of the mitigation measures described previously are anticipated to minimize the frequency, spatial extent, and severity of spills. Effects on wildlife from spills in the Project footprint are anticipated to be unlikely due to the implementation of the mitigation measures and are not expected to result in measurable environmental changes and were determined to have no residual effect on wildlife survival and reproduction. Therefore, this potential effect (chemical or hazardous material stored on the Project footprint, or spills can adversely affect wildlife survival and reproduction) is not carried forward to the residual effects characterization.

9.4.3.4.11 Changes to Bats (Little Brown Myotis and Northern Myotis)

9.4.3.4.11.1 Potential Effects

Habitat Loss and Alteration

Habitat Availability

Although habitat will be initially removed during construction, the effects on little brown myotis and northern myotis habitat availability from habitat loss will continue through Operations of the Project (in other words, closure and reclamation of the road is not anticipated).

Distribution

Although habitat will be initially removed during construction, the effects on little brown myotis and northern myotis distribution from habitat loss and alteration will continue through Operations of the Project (in other words, closure and reclamation of the road is not anticipated).

Survival and Reproduction

Although habitat will be initially removed during construction, the effects on little brown myotis and northern myotis distribution from habitat loss and alteration will continue through Operations of the Project (in other words, closure and reclamation of the road is not anticipated).

Sensory Disturbance

Habitat Availability

The effects of sensory disturbance on bats will be greater during operations because traffic will not be restricted to daylight hours. Sensory disturbance during operations may be related to vehicular traffic on the Community Access Road as the produced

noise can impair echolocation efficiency (Finch et al., 2020; Schaub et al., 2008; Siemers and Schaub, 2011). Sensory disturbance will occur along the entire length of the Community Access Road and will occur at any time of day or night during operations.

Bat activity may decrease across the Construction Disturbance Area and in proximity to it as a result of sensory disturbance during operations (Kitzes and Merenlender, 2014). Bats have been noted to have decreased activity across roads, they can act as a barrier and restrict bats from accessing critical resources (Claireau et al., 2019; Kitzes and Merenlender, 2014; Pauli et al., 2017).

During Operations, noise is predicted to reach 50 A-weighted decibels at 100 metres from the edge of the effects assessment Construction Disturbance Area (Acoustic and Vibration Environment Technical Support Document [Appendix P]). Although A-weighted decibels measure the loudness of sounds as perceived by the human ear (audible range), and bats hearing is more sensitive at higher frequencies, bats are known to avoid foraging in proximity to noise disturbance including roads.

As a precise threshold of avoidance by little brown myotis and northern myotis is not known, habitat that was within 100 metres of the Project was assumed to be negatively affected by sensory disturbance as a precautionary approach. The effects of sensory disturbance on bats are predicted to be greatest during foraging, and all terrestrial, wetland and open water habitats may provide foraging habitat (Environment Canada, 2015). Therefore, the areas of bat habitat that may be indirectly affected by sensory disturbance include all areas within 100 metres of the effects assessment Construction Disturbance Area. A total of 236 hectares of potential bat foraging habitat may be indirectly affected within 100 metres of the effects assessment Construction Disturbance Area. This represents 0.16 percent and 0.05 percent of the effects assessment Local Study Area and effects assessment Regional Study Area, respectively.

Survival and Reproduction

During Operations, noise is predicted to reach 50 A-weighted decibels at 100 metres from the edge of the effects assessment Construction Disturbance Area (Acoustic and Vibration Environment Technical Support Document [Appendix P]). Sensory disturbance can occur along the entire length of the Community Access Road and can occur at any time of day or night during operations. Although sensory disturbance from traffic may result in periodic changes to bat foraging behaviour, it is unlikely to have a measurable effect on bat survival and reproduction due to the abundance of unaffected bat foraging habitat available in the wildlife effects assessment Regional Study Area.

Incidental Take

Survival and Reproduction

During operations, incidental take of bats is unlikely, but may occur if mature trees are removed for maintenance activities during the roosting period.

Collisions with Vehicles and Equipment

Bat mortalities from collisions with vehicles and equipment are most likely to happen during operations when public vehicles are travelling along the Community Access Road. Areas where canopy heights adjacent to the road are lower may have a higher risk of bat mortality due to bats flying lower to the ground (Russell et al., 2009).

A total of 700 vehicles per day have been modelled to be using the north-south (to the Ring-of-Fire) segment of the Project, and 100 vehicles per day have been modelled to be using the east-west segment (to Marten Falls First Nation) (Appendix W). Most vehicular traffic on the north-south segment of the Project will be medium and heavy truck usage, consisting of 71 percent of traffic (AECOM, 2024). Most traffic on the east-west section of the Project is expected to be light vehicle traffic (77 percent of all traffic) (AECOM, 2024). The increase in Project-related traffic during operations, may increase the number of bat-vehicle collisions relative to existing conditions.

9.4.3.4.11.2 Mitigation and Enhancement Measures

Habitat Loss and Alteration

A Preliminary Biodiversity Offset Plan (**Appendix AB**) has been developed to counterbalance little brown myotis and northern myotis habitat loss. As the Preliminary Biodiversity Offset Plan is further developed, it is anticipated that artificial bat roost structures will be installed within temporary disturbance areas and in appropriate areas within the effects assessment Local Study Area to mitigate the removal of tree roosts for little brown myotis and northern myotis. During highway maintenance, Ministry of Transportation's Best Management Practices for Species at Risk Protection During Maintenance Activities (2017a) will be considered and included in the development of the Environmental Protection Plan.

The Environmental Protection Plan, Preliminary Biodiversity Offset Plan, cleanup and reclamation plans, and the protocol/system for reporting incidental wildlife interactions and collisions will be developed following engagement and consultation with Indigenous communities, Environment and Climate Change Canada, and the Ministry of the Environment, Conservation, and Parks Species at Risk Branch.

Sensory Disturbance

Mitigations will be implemented to minimize effects from sensory disturbance on little brown myotis and northern myotis habitat availability and survival and reproduction in the wildlife effects assessment Local Study Area during operations. The effectiveness of mitigation measures will be evaluated, and mitigation measures will be modified or enhanced as necessary through adaptive management.

During Operations, work will be completed as quickly as possible to reduce the duration of disturbance associated with maintenance activities. The Environmental Protection Plan will be implemented to minimize sensory disturbance by owner / operator, including prohibiting use of engine retarder brakes, enforcing speed limits, and restricting maintenance traffic to designated areas. Ongoing use of inactive areas will be prevented through combined use of physical control measures (rollback, remove of creek crossings, recontouring to surrounding topography, revegetation / reforesting and / or barriers at junctions with active access). During highway maintenance, Ministry of Transportation's Best Management Practices for Species at Risk Protection During Maintenance Activities (Ministry of Transportation, 2017a) will be considered and included in the development of the Environmental Protection Plan.

The Environmental Protection Plan, Preliminary Biodiversity Offset Plan, cleanup and reclamation plans, and the protocol/system for reporting incidental wildlife interactions and collisions will be developed following engagement and consultation with Indigenous communities, Environment and Climate Change Canada, and the Ministry of the Environment, Conservation, and Parks Species at Risk Branch.

Mitigations to reduce sensory disturbance by the general public during operations are difficult to enforce; however, speed limits may reduce noise associated with vehicle traffic. Owner / operator employed to conduct maintenance activities will follow the same mitigations as outlined for construction.

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources, will be followed during construction and operations.

A Preliminary Biodiversity Offset Plan (**Appendix AB**) has been developed to achieve a net positive outcome for little brown myotis and northern myotis habitat. Over the long term, measures undertaken as part of the Preliminary Biodiversity Offset Plan would be implemented to achieve a net increase in functional bat habitat relative to existing conditions.

Incidental Take

Mitigation measures described above will be applied during operations as required. During highway maintenance, Ministry of Transportation's Best Management Practices for Species at Risk Protection During Maintenance Activities (Ministry of Transportation, 2017a) will be considered and included in the development of the Environmental Protection Plan.

The Environmental Protection Plan, Preliminary Biodiversity Offset Plan, cleanup and reclamation plans, and the protocol/system for reporting incidental wildlife interactions and collisions will be developed following engagement and consultation with Indigenous communities, Environment and Climate Change Canada, and the Ministry of the Environment, Conservation, and Parks Species at Risk Branch.

Collisions with Vehicles and Equipment

Collision risk during operations will be minimized with implementation of the Environmental Protection Plan, which includes measures to minimize collisions between wildlife and vehicles. Speed limits will be posted and enforced to reduce vehicle speeds and associated collisions with wildlife.

Signage will be posted where the road crosses the Albany River and Ogoki River (important bat flyways) to notify motorists of the elevated risk of collisions with bats in these areas at night between May and November to encourage reduced travel speeds during that time.

During Operations, the ongoing use of inactive areas by the public will be minimized through physical control measures such as rollback, removal of creek crossings, felling of timber across temporary access roads, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access. Progressive reclamation and revegetation will be implemented as non-permanent features will be decommissioned and reclaimed or revegetated naturally.

During highway maintenance, Ministry of Transportation's Best Management Practices for Species at Risk Protection During Maintenance Activities (Ministry of Transportation, 2017a) will be considered and included in the development of the Environmental Protection Plan.

The Environmental Protection Plan, Biodiversity Offset Plan, cleanup and reclamation plans, and the protocol/system for reporting incidental wildlife interactions and collisions will be developed following engagement and consultation with Indigenous communities, Environment and Climate Change Canada, and the Ministry of the Environment, Conservation, and Parks Species at Risk Branch.

Mitigations will be implemented to minimize effects from collisions with vehicles and equipment on little brown myotis and northern myotis survival and reproduction in the wildlife effects assessment Local Study Area during operations.

9.4.3.4.11.3 Predicted Residual Effects

Habitat Loss and Alteration

Suitable roosting habitat within the effects assessment Local and Regional Study Area will be reduced by roughly 694 hectares which corresponds to an 11.81 percent loss and 2.59 percent loss of the available suitable habitat in the respective study areas. Habitat within temporary Construction Disturbance Areas will regenerate and / or be restored after construction; however, mature forest stands recover slowly, making this habitat unsuitable for bat maternity roosting for up to 80 years (Ministry of Natural Resources and Forestry, 2017). Habitat fragmentation may permanently alter foraging around the Community Access Road during operations.

The mitigation measures proposed are anticipated to reduce potential mortality due to clearing and grubbing of suitable roosting habitat to negligible levels.

There is a predicted residual effect of habitat loss after implementation of the mitigation measures described previously. The effect (reduced maternity roost habitat from loss or alteration of vegetation) is carried forward to the characterization of predicted residual effects.

The effect is considered negative, irreversible, continuous, and certain to occur. The direct effect of habitat loss will be confined to the Construction Disturbance Area. The effects of habitat loss and alteration will result in the fragmentation of contiguous habitat. The effects of fragmentation of habitat are predicted to occur at the scale of the Local Study Area.

Effects from habitat loss and alteration on the ability of little brown myotis and northern myotis populations in the wildlife Regional Study Area to remain self-sustaining and ecologically functional are predicted to be **low** in magnitude.

Sensory Disturbance

Sensory disturbance is probable during construction, though mitigation through identifying roosting areas and limiting noise production will reduce this. Bats are moderately tolerant to sensory disturbance but may avoid the Project area during construction and operations. The effects of sensory disturbance are expected to be permanent and irreversible during operations, continuous, probable, and limited to a local scale. Effects from sensory disturbance on the ability of little brown myotis and

northern myotis populations in the wildlife effects assessment Regional Study Area to remain self-sustaining and ecologically functional are predicted to be **negligible** in magnitude.

Incidental Take

Mitigation measures, polices, and practices for construction activities are expected to avoid and limit incidental take of roosting bats relative to existing conditions. However, these measures are not anticipated to eliminate the risk of incidental take, there are residual effects predicted after implementation of the mitigation measures.

The mitigation measures for construction activities are expected to avoid and limit incidental take of roosting or hibernating bats. Effects from incidental take on the ability of bat populations in the wildlife Regional Study Areas to remain self-sustaining and ecologically functional are predicted to be **negligible** in magnitude.

Collisions with Vehicles and Equipment

The implementation of mitigation is anticipated to limit Project-related changes to the survival and reproduction of bats from increased collision risk with vehicles and equipment. A limited number of bat mortalities during operations may occur. As such, there is a predicted residual effect after the implementation of mitigation measures described previously.

Effects are predicted to be possible, irreversible, continuous, and confined to the Construction Disturbance Area. Effects from collisions with vehicles and equipment on the ability of the little brown myotis and northern myotis populations in the wildlife effects assessment Regional Study Areas to remain self-sustaining and ecologically functional are predicted to be negative but **negligible** in magnitude.

9.4.3.4.12 Changes to Furbearers (Wolverine)

9.4.3.4.12.1 Potential Effects

Habitat Loss and Alteration

<u>Habitat Availability</u>

Although habitat will be initially removed during construction, the effects on wolverine survival and reproduction from habitat loss and alteration will continue through Operations of the Project (in other words, closure and reclamation of the road is not anticipated).

During Operations, temporary construction infrastructure will be allowed to regenerate. Newly regenerating forest stands are likely to provide good habitat for wolverines for foraging. However, wolverines may avoid denning areas within 4 km of an active road (Scrafford et al., 2018, Scrafford and Ray, 2022). Alteration of habitat due to road effects may make high-quality denning habitat within 4 km of the Project unsuitable for use as denning areas. A total of 189,145 hectares are within 4 km of the Construction Disturbance area. Suitable denning habitat within this area may be indirectly affected because of habitat alteration due to a road effects.

Habitat within the effects assessment Construction Disturbance Area is conservatively assumed to be permanently removed from the available habitat for wolverines. Loss of habitat through fragmentation, which begins in construction and continues through operation and will most likely be worse when high road traffic volumes occur.

Distribution

Although habitat will be initially removed during construction, the effects on wolverine habitat distribution from habitat loss and alteration will continue through Operations of the Project (in other words, closure and reclamation of the road is not anticipated). Effects on wolverine distribution may occur due to the tendency of females to avoid establishing natal dens in proximity to roads. Denning areas previously used by females may be completely or partially abandoned due to the road effects on denning habitat. This effect may occur up to a distance of approximately 4 km from the Construction Disturbance Area (Scrafford and Ray, 2022).

Survival and Reproduction

Although habitat will be initially removed during construction, the effects on wolverine survival and reproduction from habitat loss and alteration will continue through Operations of the Project (in other words, closure and reclamation of the road is not anticipated).

Changes to abundance associated with habitat loss during operations are likely to include the continued loss of denning habitat within the corridor, and indirect effects on suitable denning habitat within 4 km of the Construction Disturbance Area through road effects. Denning areas previously used by females may be completely or partially abandoned. Road effects may result in females avoiding high-quality denning habitat in favour of lower quality habitat located further from the road, which could affect reproductive success. Additional habitat loss may occur if denning habitat is removed during maintenance, such as during additional clearing within the corridor. This effect is unlikely as wolverines do not typically construct dens near roads (Scrafford et al., 2018).

The habitat fragmentation caused by the Project may decrease population connectivity which could result in genetic isolation and demographic fragmentation (Sawaya et al., 2019).

Habitat loss and alteration may also affect wolverine survival and reproduction through changes to food resources. Ungulates are an important food resource for wolverines for much of the year, and ungulate species (in other words, caribou and moose) in the effects assessment Regional Study Area are also noted to be sensitive to both sensory disturbance and anthropogenic linear features. There may be areas modified during the Project where additional non-animal forage, such as berries that grow well in disturbed environments and edge habitat, may become more abundant. Foraging in the edges of cleared habitat, such as aggregate pits and newly regenerating forest, has been documented (Scrafford et al., 2017). Shifts from higher quality to lower quality food resources in the wolverine effects assessment Local Study Area resulting in changes to ungulate distribution may affect the energy budget of wolverines, particularly those with home ranges close to the Project. This may influence mortality and reproductive success.

Sensory Disturbance

Habitat Availability

Sensory disturbance may also modify wolverine habitat use within the wolverine effects assessment Local Study Area during operations. Maintenance activities will have an effect on the noise levels in the effects assessment Construction Disturbance Area, and traffic from road use may also disturb wolverines near the road right-of-way (Sawaya et al., 2019).

Noise modelling indicates that vehicle traffic on the Community Access Road during operations will result in noise levels ranging from 41 to 53 A-weighted decibels at the edge of the effects assessment Construction Disturbance Area. Noise levels at 500 metres from the effects assessment Construction Disturbance Area are predicted to range between 38 and 41 A-weighted decibels, which are below the daytime level of 45 A-weighted decibels that is typical of rural and remote areas, as described in the Guidance for Evaluating Human Health Effects in Impact Assessment: Noise (Health Canada, 2023). In addition, ground vibrations induced by vehicle traffic during operations are predicted to be negligible beyond 25 metres of the right-of-way of the Community Access Road (Acoustic and Vibration Technical Support Document [**Appendix P**]).

Wolverines are known to avoid constructing dens near active roads. In the Red Lake area of Ontario, den sites were observed at an average of 1 kilometres from smaller

industrial roads and 4.8 kilometres from major roads (Scrafford and Ray, 2022). Maintenance activities will be short-to-medium term disturbances that happen repeatedly during the operation of the Community Access Road, while traffic will be a continuous source of sensory disturbance.

Sensory disturbance of varying levels can occur along the entire length of the Community Access Road and can occur at any time of day during operations.

Distribution

Animals may remain sensitive to the presence of people and vehicles on the Community Access Road during operations (Leblond et al., 2013). During operations, sensory disturbance will mostly be produced by road use and maintenance activities. During Operations, an Average Annual Daily Traffic of 700 vehicles on the north-south section and 100 vehicles on the east-west section is anticipated by 2046. An estimated 64 percent of the traffic on the north-south segment and 3 percent of the traffic on the east-west segment of the Community Access Road is anticipated to be heavy trucks (in other words, vehicles with three or more axles designed for transportation of cargo), which will create more sensory disturbance than light-duty and medium trucks used for personal and business use. No mining trucks are anticipated to use the east-west segment of the Community Access Road; however, the east-west segment may have commercial truck traffic accessing the aggregate facilities near the community for maintenance of the road. Although there may be periods with long intervals between vehicles along one location on the Community Access Road (infrequent disturbance), during other periods vehicles may be using the road through the day and night and the interval between vehicles would be relatively shorter resulting in frequent to continuous sensory disturbance.

The continued operation of quarries during Operations is predicted to emit noise levels between 55 and 77 A-weighted decibels at the edge of the effects assessment Construction Disturbance Area (Acoustic and Vibration Technical Support Document [Appendix P]). Existing vibration levels are expected to increase, on occasion, due to quarry blasting activities but blast-induced vibration will be temporary in nature, occur only during specific activities, and would be limited to the vicinity of Project quarries. Ground vibration from occasional quarry blasting during operations is expected to produce a short-term increase in ground vibration and air overpressure within the vicinity of a blast source (Acoustic and Vibration Technical Support Document [**Appendix P**]).

As such, the effect of sensory disturbance during operations from maintenance activities and traffic are anticipated to have an ongoing effect on wolverine behaviours, such as dispersal and avoidance of human activities.

Survival and Reproduction

A long-term change in otherwise good quality denning habitat due to sensory disturbance is also likely to occur. During operations, wolverines may avoid denning near the Community Access Road (Scrafford et al., 2018) and may experience a loss of denning habitat greater than the direct habitat loss from the Project. Less available denning habitat within home ranges that overlap or are in proximity to the Project may decrease the reproductive output of the population and lead to changes in abundance. Sensory disturbance from roads may also create a partial barrier to dispersal and foraging, which may also influence abundance. Changes to foraging behaviour and increased movement speed near roads has also been documented (Scrafford et al., 2018), either of these effects may induce stress and increase energy expenditure, influencing mortality or the reproductive output of animals in the wolverine effects assessment Regional Study Area.

During Operations, sensory disturbance will decrease, and it is anticipated that species will adapt and prey species such as ungulates may return to the areas surrounding the effects assessment Construction Disturbance Area. Edge habitat maintained along the corridor may be used by wolverines to hunt some smaller prey and forage for non-animal food resources. Sensory disturbance may still reduce ungulate use of the area, and the presence of the anthropogenic linear feature may further reduce the quality of habitat for prey resources.

Increase in Predator Access

Distribution

Although effects on the distribution of wolverine will initially occur during construction, the effects on wolverine distribution will continue through Operations of the Project (in other words, closure and reclamation of the road is not anticipated).

Survival and Reproduction

Some species that wolverines may have competitive interactions with are anticipated to benefit from anthropogenic linear features such as roads, particularly during times when traffic is light. Coyotes and grey wolves may travel along the corridor during operations and may interact competitively with wolverines. Once constructed, the Community Access Road is expected to have a sufficient amount of vehicle traffic that predators would likely not or infrequently use the road right-of-way for travel except during periods

when traffic is light. However, during operations, predators are more likely to travel along access roads that have been decommissioned and have limited human activity because they will be naturally revegetating and may attract moose and deer; animals that select early seral vegetation for browse (McLoughin et al. 2019; Kautz et al. 2021). Additionally, wolves and black bears may exploit wolverines as a prey resource (Ontario Wolverine Recovery Team, 2013). As a result, the increase in linear features due to the Project could improve predator mobility and increase encounter rates between predators and wolverine in the wolverine effects assessment Local Study Area.

While there is anticipated to be an increase in competition for food resources, increased movement of wolves and other predators along the Project corridor and access roads may lead to an increase in available food resources for wolverines that are known to scavenge carrion.

Incidental Take

Incidental take from maintenance operations is unlikely to occur during operations because wolverines are not known to build dens near roads (Ontario Wolverine Recovery Team, 2013).

Collisions with Vehicles and Equipment

During Operations, traffic volumes are expected to be greatest on the north-south section of the Community Access Road compared to the east-west section that connects to the Marten Falls First Nation. Specifically, the predicted average annual daily traffic volumes are 700 vehicles on the north-south section and 100 vehicles on the east-west section (Appendix W). Heavy trucks will make up over half (64 percent) of the traffic on the north-south section while the traffic on the east-west section will consists of 3 percent heavy trucks and the remaining as light-duty vehicles and medium-size trucks. Traffic volumes are expected to vary temporally and spatially, with a greater volume occurring in the south compared to northernmost portions of the Community Access Road where human density is lower. As a result, most of the wolverine-vehicle collisions that may occur during operations are likely to be attributed to collisions with public and industry vehicles that are not associated with the Project.

Vehicle collisions with wolverines are most likely during operations during the anticipated average daily traffic volumes on the Community Access Road occur and traffic speed limits cannot be easily enforced. Normal road operation may carry a greater risk than maintenance as sensory disturbance will likely be lower, and vehicles may be moving at a higher speed. Young dispersing males may be particularly vulnerable to mortality from collisions with vehicles (Ontario Wolverine Recovery Team, 2013). Due to the low density of wolverines in the effects assessment Regional Study

Area, and the species' low reproductive rate, mortality of even a small number of females may negatively affect the regional population (Scrafford and Ray, 2022; Scrafford et al., 2024). Wolverines may also be attracted to new disturbances as potential foraging opportunities, which may increase the possibility of road mortalities during early operations (Scrafford et al., 2017). This effect will be permanent, though it may have a lower magnitude than in other study areas as the road density following construction will be lower than that of other studies, such as the Red Lake study (Scrafford et al., 2021).

Increase in Public Access

Trapping has a notable effect on the sustainability of wolverine populations (Ontario Wolverine Recovery Team, 2013). There are ten trap lines overlapping the Local Study Area. Increase in public access to the corridor during operations may cause a corresponding increase in trapping pressure on the wolverine population. Wolverine mortalities and injuries have been demonstrated to occur due to incidental catch during fur trapping (Scrafford et al., 2024; Ontario Wolverine Recovery Team, 2013). Although non-indigenous trappers are prohibited from targeting wolverine in Ontario, an unknown number of wolverines are harvested incidentally each year (Scrafford et al., 2024).

The potential increase in trapping and the corresponding increase in wolverine mortality within the wolverine effects assessment Local and Regional Study Area resulting from the increase in public access is not possible to predict because fur market prices influence efforts expended on trapping (Ontario Wolverine Recovery Team, 2013).

9.4.3.4.12.2 Mitigation and Enhancement Measures

Habitat Loss and Alteration

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources, will be followed during operations. During highway maintenance, Ministry of Transportation's Best Management Practices for Species at Risk Protection During Maintenance Activities (Ministry of Transportation, 2017a) will be considered and included in the development of the Environmental Protection Plan.

The Environmental Protection Plan, Biodiversity Offset Plan, cleanup and reclamation plans, and the protocol/system for reporting incidental wildlife interactions and collisions will be developed following engagement and consultation with Indigenous communities, Environment and Climate Change Canada, and the Ministry of the Environment, Conservation, and Parks Species at Risk Branch.

The effectiveness of mitigation measures will be evaluated during operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Sensory Disturbance

Mitigation measures will be implemented to minimize effects from sensory disturbance on wolverine habitat availability, distribution, and survival and reproduction in the wildlife effects assessment Local Study Area during operations. The effectiveness of mitigation measures will be evaluated during construction and operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

During Operations, work will be completed as quickly as possible to reduce the duration of disturbance associated with maintenance activities. The Environmental Protection Plan will be implemented to minimize sensory disturbance by owner / operators, including prohibiting use of engine retarder brakes, enforcing speed limits, and restricting maintenance traffic to designated areas. Ongoing use of inactive areas will be prevented through combined use of physical control measures (rollback, remove of creek crossings, recontouring to surrounding topography, revegetation / reforesting and / or barriers at junctions with active access). During highway maintenance, Ministry of Transportation's Best Management Practices for Species at Risk Protection During Maintenance Activities (Ministry of Transportation, 2017a) will be considered and included in the development of the Environmental Protection Plan.

The Environmental Protection Plan, Preliminary Biodiversity Offset Plan (**Appendix AB**), cleanup and reclamation plans, and the protocol / system for reporting incidental wildlife interactions and collisions will be developed following engagement and consultation with Indigenous communities, Environment and Climate Change Canada, and the Ministry of the Environment, Conservation, and Parks Species at Risk Branch.

During operations, quarry operations will occur periodically. If any periodic quarry operations planned to occur during the denning period, these activities will be preceded by wolverine den surveys conducted within 4 km of quarry operations. Quarry operations will not be conducted within 4 km of active wolverine dens during the denning period.

Mitigations to reduce sensory disturbance by the general public during operations are difficult to enforce; however, speed limits will be posted and enforced to reduce vehicle speeds and associated noise and dust emission levels.

Increase in Predator Access

To minimize ongoing attraction of predators to the Project area, road kill will be cleaned up following best management practices outlined by Ontario's Ministry of Transportation and wildlife access to waste will be restricted. The ongoing use of inactive areas by predators will be minimized through physical control measures such as rollback, removal of creek crossings, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access. During highway maintenance, Ministry of Transportation's Best Management Practices for Species at Risk Protection During Maintenance Activities (Ministry of Transportation, 2017a) will be considered and included in the development of the Environmental Protection Plan.

The Environmental Protection Plan, Biodiversity Offset Plan, cleanup and reclamation plans, and the protocol/system for reporting incidental wildlife interactions and collisions will be developed following engagement and consultation with Indigenous communities, Environment and Climate Change Canada, and the Ministry of the Environment, Conservation, and Parks Species at Risk Branch.

Incidental Take

During operations, any periodic blasting will be completed outside of the denning period. Mitigation measures described above will be applied during operations as required. During highway maintenance, Ministry of Transportation's Best Management Practices for Species at Risk Protection During Maintenance Activities (Ministry of Transportation, 2017a) will be considered and included in the development of the Environmental Protection Plan.

The Environmental Protection Plan, Preliminary Biodiversity Offset Plan (**Appendix AB**), cleanup and reclamation plans, and the protocol/system for reporting incidental wildlife interactions and collisions will be developed following engagement and consultation with Indigenous communities, Environment and Climate Change Canada, and the Ministry of the Environment, Conservation, and Parks Species at Risk Branch.

Collisions with Vehicles and Equipment

During Operations traffic will be restricted to approved right-of-way, workspace, and access roads or trails. Pits and quarries and other infrastructure required for maintenance activities will be gated to limit public access. A reporting protocol and system to report incidental wildlife observations and wildlife-vehicle collisions during operations will be developed. Appropriate speed limits, wildlife crossing, and wildlife warning signage will be posted. Speed limits will be implemented and enforced. During highway maintenance, Ministry of Transportation's Best Management Practices for

Species at Risk Protection During Maintenance Activities (Ministry of Transportation, 2017a) will be considered and included in the development of the Environmental Protection Plan.

The Environmental Protection Plan, Preliminary Biodiversity Offset Plan (**Appendix AB**), cleanup and reclamation plans, and the protocol/system for reporting incidental wildlife interactions and collisions will be developed following engagement and consultation with Indigenous communities, Environment and Climate Change Canada, and the Ministry of the Environment, Conservation, and Parks Species at Risk Branch.

The effectiveness of mitigation measures will be evaluated during construction, Operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Increase in Public Access

During Operations, the Community Access Road will be accessible to the public but access roads for aggregate areas and other infrastructure required for maintenance activities will be gated to limit public access. Employees will be prohibited from hunting or carrying firearms while working on the Project maintenance. During highway maintenance, Ministry of Transportation's Best Management Practices for Species at Risk Protection During Maintenance Activities (Ministry of Transportation, 2017a) will be considered and included in the development of the Environmental Protection Plan.

The Environmental Protection Plan, Preliminary Biodiversity Offset Plan (**Appendix AB**), cleanup and reclamation plans, and the protocol / system for reporting incidental wildlife interactions and collisions will be developed following engagement and consultation with Indigenous communities, Environment and Climate Change Canada, and the Ministry of the Environment, Conservation, and Parks Species at Risk Branch.

A proactive outreach and education program aimed at increasing awareness of the presence of wolverine within the area, the potential effects of incidental trapping on wolverine populations, and effective mitigation measures that reduce the likelihood of incidental wolverine trapped as outlined in Best Management Practices to Avoid Wolverine (Ontario Fur Managers Federation, 2018) will be developed and implemented.

The effectiveness of mitigation measures will be evaluated during construction and operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.3.4.12.3 Predicted Residual Effects

Habitat Loss and Alteration

The implementation of mitigation measures described above are expected to limit negative effects from habitat loss and alteration on this species in the wolverine effects assessment Local and Regional Study Areas. Wolverine will directly lose 4,700 hectares of habitat. The total direct loss of habitat is much smaller than a single female wolverine home range. However, due to the linear distribution of the disturbance and the fact that wolverines have large home ranges and high daily movement rates, a large portion of the regional population will be affected by habitat loss and alteration resulting from the Project. While the loss of habitat in the wolverine Local Study Area has the potential to affect the home ranges of local individuals, wolverine occupying the wolverine effects assessment Regional Study Area, will still have an amount of undisturbed habitat that remains intact and is anticipated to support a self-sustaining and ecologically functional population.

There are residual effects predicted after implementation of the mitigation measures. After mitigation, the Project is expected to result in a net residual effect on wolverine habitat availability, distribution and survival and reproduction from habitat loss and alteration associated with operations. Therefore, the potential effect of habitat loss and alteration is carried forward in the assessment.

Effects of habitat loss and alteration are predicted to be certain, irreversible, and continuous. The direct effect of habitat loss will be confined to the Construction Disturbance Area. The effects of habitat loss and alteration will result in the fragmentation of contiguous habitat. The effects of fragmentation of habitat are predicted to occur at the scale of the effects assessment Local Study Area.

Effects from habitat loss and alteration on the ability of the wolverine population in the effects assessment Regional Study Area to remain self-sustaining and ecologically functional are anticipated to be **negative** and **moderate** in magnitude.

Sensory Disturbance

Road traffic will cause sensory disturbance to wolverines indefinitely during operations.

Large prey species may move away from the Community Access Road within the effects assessment Regional Study area due to sensory disturbances and changes in the movement of predators. Residual effects, with the exception of changes in the distribution of ungulate prey resources, are expected to be localized to the area surrounding the effects assessment Construction Disturbance Area. There are residual effects predicted after implementation of the mitigation measures.

Effects from habitat sensory disturbance on the ability of the wolverine populations in the wolverine effects assessment Regional Study Area to remain self-sustaining and ecologically functional are anticipated to be **negative** and **low** in magnitude.

Increase in Predator Access

Mitigation, particularly of temporary access roads, will reduce but not eliminate the potential for the Project to cause adverse interactions between wolverines and other predatory wildlife. The permanent road will provide a corridor that may be used by wolves and coyotes to occupy areas where they would be competing with wolverines. As mesopredators, coyotes may have a measurable effect on the availability of food for wolverines. Both wolves and coyotes may alter the distribution of prey resources around the effects assessment Construction Disturbance Area. Changes to the movement of wolves and coyotes are expected to decline with distance from the Community Access Road, with the highest level of effect immediately surrounding the Construction Disturbance Area. There are residual effects predicted after implementation of the mitigation measures.

Effects on wolverine survival and reproduction from increased predator access are predicted to be possible, continuous, permanent (permanent access roads) or long term (decommissioned and revegetated access roads) and will be confined to the wolverine effects assessment Local Study Area. Considering that the Project will result in a very small increase in linear feature density in the wolverine effects assessment Regional Study Area (0.04 kilometres per square kilometre), and linear corridors will remain absent or limited in most of the wolverine effects assessment Regional Study Area, effects from increased predator access on the ability of the wolverine population to remain self-sustaining and ecologically functional are anticipated to be negative and **negligible** in magnitude.

Incidental Take

Incidental take from destroying or disturbing dens is not expected to occur during operations.

After mitigation, effects of incidental take are predicted to be possible, medium term and irreversible, infrequent, and confined to the Construction Disturbance Area. Effects from incidental take on the ability of wolverine in the wolverine effects assessment Regional Study Area to remain self-sustaining and ecologically functional are anticipated to be negative but **low** in magnitude.

Collisions with Vehicles and Equipment

During operations, road collisions will likely be a source of mortality for wolverines. Vehicle collisions are a potentially persistent source of mortality for wolverines (Krebs and Lewis, 1999; Krebs et al., 2004). As relatively large carnivores with very low reproductive rates and large home ranges, wolverines are expected to be particularly sensitive to road mortality (Rytwinski and Fahrig, 2011). Due to the low density of wolverines in the effects assessment Regional Study Area, and the low reproductive potential of wolverines, mortality of even a small number of females may have negative effects on wolverine survival and reproduction. There are residual effects predicted after implementation of the mitigation measures.

The effects of collisions with vehicles and equipment are predicted to be possible, continuous, permanent and irreversible, and confined to the effects assessment Construction Disturbance Area. After mitigation, the effects from collisions with vehicles and equipment on the ability of the wolverine populations in the wildlife effects assessment Regional Study Areas to remain self-sustaining and ecologically functional are anticipated to be negative and **moderate** in magnitude.

Increase in Public Access

The Project is expected to result in a measurable increase in public access and trapping opportunities for Indigenous and non-Indigenous trappers in the wolverine effects assessment Local Study Area during operations relative to existing conditions. Closure of temporary access roads will help mitigate the effect of increased public access on trapping mortality. Public access will remain increased in areas near the Community Access Road and temporary infrastructure may still provide increased access to people travelling on foot or by all-terrain vehicle, even with the entrances blocked. Any increase in wolverine trapping effort may have a measurable effect on wolverine survival and reproduction. There are residual effects predicted after implementation of the mitigation measures.

The effects of increase in public access are predicted to be possible, continuous, irreversible, and confined to the wildlife effects assessment Local Study Area. After mitigation, the effects from Increase in Public Access on the ability of the wolverine population in the wolverine effects assessment Regional Study Areas to remain self-sustaining and ecologically functional are anticipated to be negative but **low** in magnitude.

9.4.3.4.13 Changes to Furbearers (American Marten)

9.4.3.4.13.1 Potential Effects

Habitat Loss and Alteration

Habitat Availability

Although habitat will be initially removed during construction, the effects on American marten habitat availability from habitat loss and alteration will continue through Operations of the Project (in other words, closure and reclamation of the Community Access Road, its associated right-of-way and aggregate areas are not anticipated). An exception to this is that temporary features (for example, laydown areas, construction camps, some access roads) will be decommissioned and reclaimed or left to revegetate naturally are anticipated to provide functional marten habitat after 70 years or more, once mature, structurally complex forests have established.

During operations, the new linear feature as well as clearing associated with maintenance will result in a loss of habitat for American martens. During operations, habitat will be altered along the road right-of-way regularly during clearing conducted for ongoing maintenance.

Distribution

Although habitat will be initially removed during construction, the effects on American marten distribution from habitat loss and alteration will continue indefinitely through Operations of the Project (in other words, closure and reclamation of the road is not anticipated).

A total of 60 metres of the 100 metre wide right-of-way will be permanently disturbed during operations. As discussed above under Habitat Availability, reclamation of temporary features is expected to provide functional marten habitat after 70 years or more. This may reduce the connectivity of marten habitat and cause habitat fragmentation over the long term. Connectivity of marten habitat is currently limited only by natural features in the effects assessment Local Study Area. Anthropogenic linear features may impede marten movement in some areas; however, marten are strong dispersers and may continue to cross the road right-of-way even during operations.

Survival and Reproduction

The effects on American marten survival and reproduction from habitat loss and alteration will continue through Operations of the Project (in other words, closure and reclamation of the road is not anticipated). However, American martens are not limited

by habitat availability in the wildlife effects assessment Regional Study Area and the small amount of vegetation removed for maintenance is unlikely to have a measurable effect on marten survival or reproduction beyond the effects assessment Construction Disturbance Area during operations.

Sensory Disturbance

Habitat Availability

Operation of the Community Access Road after construction as well as maintenance and inspection activities may also result in sensory disturbance. This effect has also been assessed as probable, though the magnitude of the effect is likely to be lower than that of the sensory disturbance during construction.

Survival and Reproduction

Sensory disturbance will be highest during construction but may continue after construction while the road is in use (medium to long term).

Increase in Predator Access

Distribution

Effects of the Project on the movement of other wildlife species (such as, wolves, Canada lynx, coyotes), may affect the distribution of American marten in the study area during operations. If predators or competitive species use either the Community Access Road or associated infrastructure as a movement corridor, American martens may avoid the area.

Survival and Reproduction

Some species that may prey on or compete with American martens can benefit from anthropogenic linear features such as roads, particularly during times when traffic is light. Linear features facilitate predator movement into areas that were previously less accessible (Brody and Pelton, 1989; Jalkotzy et al., 1997; Stuart-Smith et al., 1997; Rettie et al., 1998; James and Stuart-Smith, 2000; Tigner et al., 2014; Dickie et al., 2017, 2020). Coyotes, Canada lynx, and grey wolves may travel along the corridor during operations and may interact competitively with or prey upon American marten. This effect is more difficult to mitigate than that of the construction phase and will be permanent.

Incidental Take

Survival and Reproduction

Incidental take of denning American marten from direct habitat loss would be restricted to the effects assessment Construction Disturbance Area, but potential effects from disturbance to a den could occur at the local scale. This effect is considered to be infrequent because mitigation is expected to be effective.

Collisions with Vehicles and Equipment

Survival and Reproduction

During Operations, traffic volumes are expected to be greatest on the north-south section of the Community Access Road compared to the east-west section that connects to the Marten Falls First Nation. Traffic volumes are expected to vary temporally and spatially, with a greater volume occurring in the south compared to northernmost portions of the Community Access Road where human density is lower. As a result, most of the marten-vehicle collisions that occur during operations are likely to be attributed to collisions with public and industry vehicles that are not associated with the Project.

Long-term risks to American marten from collisions with vehicles and equipment are greater during operations when the Community Access Road is in use by the public. During operations, the speed limits will be higher and likely more difficult to enforce. The mortality risk from vehicle collision is permanent for as long as the road is in use.

Increase in Public Access

Survival and Reproduction

During operations, an increase in trapping pressure on American marten may correspond with an increase in public access along the corridor, both in the Community Access Road and temporary access roads. There are ten traplines that overlap the Local Study Area.

The potential increase in trapping and the corresponding increase in American marten mortality within the wildlife effects assessment Regional Study Area resulting from the increase in public access is not possible to predict because fur market prices and other unpredictable variables influence efforts expended on trapping.

9.4.3.4.13.2 Mitigation and Enhancement Measures

Habitat Loss and Alteration

Mitigation measures will be implemented to avoid, minimize, and restore the effects from the Project on American marten habitat availability, distribution, and survival and reproduction in the wildlife effects assessment Local Study Area and Regional Study Area.

A cleared right-of-way width of 60 metres will be maintained during operation of the road. Buffer zones of 30 metres will be maintained around waterbodies, clearing of riparian vegetation will be limited to the extent practicable and to the requirement of the access road and alignment clearing width only. Any American marten dens observed will be marked as sensitive sites and the location buffered appropriately to prevent disturbance as furbearer den sites are protected under the *Fish and Wildlife Conservation Act* 1997 (Government of Ontario, 1997).

An Environmental Protection Plan and a Cleanup and Reclamation Plan will be developed and implemented. Where necessary, seedling planting will occur to improve reclamation success on areas of temporary disturbance (for example, temporary access roads, laydown areas, camps, and workspaces) where habitat enhancement is identified. Reclamation plans will be confirmed through engagement with Indigenous communities, the Ministry of Natural Resources, and local foresters. Effectiveness of reclamation efforts will be monitored and managed post-construction, including confirmation that vegetation communities that naturally regenerate (or were planted) are similar to adjacent vegetation communities. If required, adaptive management will be employed to modify or enhance any reclamation efforts.

The effectiveness of mitigation measures will be evaluated during construction, Operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Sensory Disturbance

Speed limits will be posted and enforced to reduce vehicle speeds and associated noise and dust emission levels.

The effectiveness of mitigation measures will be evaluated during construction, Operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Increase in Predator Access

To minimize ongoing attraction of predators to the Project area, road kill will be cleaned up following best management practices outlined by Ontario's Ministry of Transportation and wildlife access to waste will be restricted. The ongoing use of inactive areas by predators will be minimized through physical control measures such as rollback, removal of creek crossings, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access.

The effectiveness of mitigation measures will be evaluated during operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Incidental Take

Mitigation measures described above will be applied during operations as required.

Collisions with Vehicles and Equipment

During operations, traffic will be restricted to approved right-of-way, workspace, and access roads or trails. Pits and quarries and other infrastructure required for maintenance activities will be gated to limit public access. A reporting protocol and system to report incidental wildlife observations and wildlife-vehicle collisions during construction and operations will be developed. Appropriate speed limits, wildlife crossing, and wildlife warning signage will be posted. Speed limits will be implemented and enforced.

These mitigation measures are expected to minimize the potential effects on American marten survival and reproduction. The effectiveness of mitigation measures will be evaluated during construction and post-construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Increase in Public Access

During operations, the Community Access Road will be accessible to the public but access roads for aggregate areas and other infrastructure required for maintenance activities will be gated to limit public access. Employees will be prohibited from hunting or carrying firearms while working on the Project maintenance.

The effectiveness of mitigation measures will be evaluated during construction and operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.3.4.13.3 Predicted Residual Effects

Habitat Loss and Alteration

A permanent loss of 3,627 hectares of the available American marten habitat present in the effects assessment Local and Regional Study Area will occur within the Construction Disturbance Area. Temporary loss of additional habitat may occur during operations if clearing is required for maintenance activities. Marten habitat is not considered limiting within the effects assessment Local and Regional Study Area. There are residual effects predicted after implementation of the mitigation measures.

The effects of habitat loss and alteration on American marten are predicted to be certain, continuous, and irreversible. The direct effect of habitat loss will be confined to the Construction Disturbance Area. The effects of habitat loss and alteration will result in the fragmentation of contiguous habitat. The effects of fragmentation of habitat are predicted to occur at the scale of the Local Study Area.

After mitigation, the effects from habitat loss and alteration on the ability of the American marten population in the effects assessment Regional Study Area to remain self-sustaining and ecologically functional are anticipated to be **negative** and **low** in magnitude.

Sensory Disturbance

Sensory disturbance will be lower during operations but will be permanent during the operation of the Community Access Road. Mitigation should reduce the effect during maintenance activities, but not during operation. American martens in the effects assessment Local Study Area may experience some habitat fragmentation due to reduced crossings of the road.

Sensory disturbance will affect American martens with home ranges near the Community Access Road, a relatively small percentage of the martens expected to be present within the effects assessment Local and Regional Study Area. These animals are anticipated to modify their behaviours and habitat use.

The effects of sensory disturbance on American marten are predicted to be probable, continuous, irreversible, and confined to the wildlife effects assessment Local Study Area. Effects from habitat sensory disturbance on the ability of the American marten populations in the wildlife effects assessment Regional Study Area to remain self-sustaining and ecologically functional are anticipated to be **negative** and **low** in magnitude.

Increase in Predator Access

Mitigation, particularly of temporary access roads, will reduce but not eliminate the potential for the Project to increase interactions between American martens and predatory wildlife. The permanent road will provide a corridor that may be used by American marten predators, such as wolves, coyotes, and lynx to occupy new areas. As mesopredators, coyotes may have a measurable effect on the availability of food for mustelids. Both wolves and coyotes may alter the distribution of prey resources around the effects assessment Construction Disturbance Area. Changes to the movement of wolves and coyotes are expected to decline with distance from the Community Access Road, with the highest level of effect immediately surrounding the Construction Disturbance Area. There are residual effects predicted after implementation of the mitigation measures.

Effects on American marten survival and reproduction from increased predator access are predicted to be possible, continuous, permanent (permanent access roads) or long-term (decommissioned and revegetated access roads) and will be confined to the wildlife effects assessment Local Study Area. Effects from increased predator access on the ability of the American marten population to remain self-sustaining and ecologically functional are anticipated to be **negative** and **negligible** in magnitude.

Incidental Take

the Project because American marten are unlikely to attempt to den within the regularly maintained road right-of-way.

Effects from incidental take are predicted to be possible, medium-term and irreversible, infrequent, and confined to the effects assessment Construction Disturbance Area. Effects from incidental take on the ability of American marten in the effects assessment Regional Study Area to remain self-sustaining and ecologically functional are anticipated to be negative and **low** in magnitude.

Collisions with Vehicles and Equipment

Collisions with vehicles and equipment may affect the survival of some American marten during operations. Only a very small proportion of the American marten population within the Regional Study Area is likely to be located near the effects assessment Construction Disturbance Area, and collisions with vehicles and equipment are likely to affect only a small number of these animals. There are residual effects predicted after implementation of the mitigation measures.

Effects are predicted to be possible, irreversible, continuous, and confined to the Construction Disturbance Area. Effects from collisions with vehicles and equipment on

the ability of the American marten populations in the wildlife Regional Study Areas to remain self-sustaining and ecologically functional are anticipated to be negative but **negligible** in magnitude.

Increase in Public Access

During operations, access to marten habitat near the Community Access Road will be permanently increased. An increase in trapping pressure may accompany this. Temporary access roads, even if they are blocked to road vehicles, may increase human accessibility on foot or by an all-terrain vehicle. A permanent increase in trapping pressure near the Community Access Road corridor is possible, with potential effects on American marten survival. Any increase in trapping mortality would decrease with distance from the Community Access Road and likely be highest for those animals whose home ranges are nearest the road. There are residual effects predicted after implementation of the mitigation measures.

The potential increase in trapping and the corresponding increase in American marten harvest within the wildlife effects assessment Regional Study Area resulting from the increase in public access is not possible to predict because fur market prices influence efforts expended on trapping.

After mitigation, effects from Increase in Public Access on the ability of the American marten population in the wildlife effects assessment Regional Study Areas to remain self-sustaining and ecologically functional are predicted to be negative but **low** in magnitude.

9.4.3.4.14 Changes to Furbearers (Beaver)

9.4.3.4.14.1 Potential Effects

Habitat Loss and Alteration

Habitat Availability

Although habitat will be initially removed during construction, the effects on beaver habitat availability from habitat loss and alteration will continue through Operations of the Project (in other words, closure and reclamation of the road is not anticipated).

During operations, clearing of the right-of-way may remove vegetation that is a component of beaver foraging habitat. Intermittent changes to wetland habitat may occur during culvert maintenance and replacement, as well as bridge maintenance. Although, beaver guards will be installed to prevent beavers from damming culverts, beaver dams may need to be removed as part of culvert maintenance if beaver guards

are unsuccessful, and associated removals will temporarily disturb beaver habitat. Ministry of Transportation's Guide for Fisheries – Best Management Practices (2025) will be followed when beaver dams are removed from within a waterbody supporting fish and fish habitat.

Distribution

Although habitat will be initially removed during construction, the effects on beaver distribution from habitat loss and alteration will continue through Operations of the Project (in other words, closure and reclamation of the road is not anticipated).

Beavers are also likely to use culverts to construct dams (Tremblay et al., 2017). Dams within culverts may need to be removed to prevent flooding from damaging the road, if beaver guards are unsuccessful at preventing beavers from attempting to dam surface water flow at culverts. The associated removals may cause a temporary loss of habitat. This has been also noted as a concern by Indigenous communities who provided feedback/input on the Project in the form of Indigenous Knowledge (Dillon, 2024b; Marten Falls First Nation, 2023a).

The maintenance of the Community Access Road corridor to keep it clear of trees and shrubs which provide forage for beavers and the possible removal of beaver dams around the road may affect beaver habitat selection and distribution within the effect assessments Regional Study Area. The effects assessment Construction Disturbance Area is small compared to the size of beavers' home ranges on the local scale, and a measurable effect on beaver distribution is not expected from the Project.

Survival and Reproduction

Although habitat will be initially removed during construction, the effects on beaver survival and reproduction from habitat loss and alteration will continue through Operations of the Project (in other words, closure and reclamation of the road is not anticipated). However, beavers are not limited by habitat availability in the wildlife effects assessment Regional Study Area and the small amount of vegetation removed for maintenance is unlikely to have a measurable effect on beaver survival or reproduction during operations.

Sensory Disturbance

Habitat Availability

Effects from sensory disturbances will be present but different during operations compared to during construction. During construction, activities will be primarily

confined to daylight hours and will be of relatively short duration (in other words, confined to the start and end of construction of each road segment).

Conversely, during operations, sensory disturbance will occur throughout the day over the life of the Project and along the full length of the road. Beavers' low sensitivity to sensory disturbance makes it unlikely that there will be a measurable effect on habitat availability because of sensory disturbance from the Project.

Survival and Reproduction

Sensory disturbances will likely be present but different during operations. Beavers' low sensitivity to sensory disturbance makes it unlikely that there will be a measurable

Increase in Predator Access

Distribution

Effects of the Project on the movement of beaver predators (in other words, wolves, lynx, coyotes), may affect the distribution of beavers in the study area during operations. Beavers avoid using foraging trails when predator scents are present (Severud et al., 2011), potentially affecting their distribution and habitat use.

Survival and Reproduction

Some species that may prey on beavers can benefit from anthropogenic linear features such as roads, particularly during times when traffic is light. Linear features facilitate predator movement into areas that were previously less accessible (Brody and Pelton, 1989; Jalkotzy et al., 1997; Stuart-Smith et al., 1997; Rettie et al., 1998; James and Stuart-Smith, 2000; Tigner et al., 2014; Dickie et al., 2017, 2020). Coyotes, grey wolves, and lynx may travel along the corridor during operations and may increase predation pressure on beavers in the wildlife effects assessment Local Study Area. This effect is more difficult to mitigate than that of the construction phase and will be permanent. However, little to no evidence has been found linking effects to beaver populations to increases in predation risk or industrial activities (in other words, roads, seismic lines) in northeast British Columbia (Mumma et al., 2018). In fact, studies have inferred that predators, and therefore predation risk, are incapable of limiting beaver population growth despite high levels of predation (Theberge and Theberge, 2004; Sidorovich et al., 2017).

Incidental Take

During operations, incidental take of beavers is possible if beaver dams or lodges need to be removed during maintenance of the road. Ministry of Transportation's Guide for

Fisheries – Best Management Practices (2025) will be followed when beaver dams are removed from within a waterbody supporting fish and fish habitat.

Collisions with Vehicles and Equipment

Survival and Reproduction

During Operations, traffic volumes are expected to be greatest on the north-south section of the Community Access Road compared to the east-west section that connects to the Marten Falls First Nation. Traffic volumes are expected to vary temporally and spatially, with a greater volume occurring in the south compared to northernmost portions of the Community Access Road where human density is lower. As a result, most of the beaver-vehicle collisions that may occur during operations are likely to be attributed to collisions with public and industry vehicles that are not associated with the Project.

Long-term risks to beaver from collisions and equipment are greater during operations when the Community Access Road will be used by the public. During operations, the speed limits will be higher and likely more difficult to enforce. The mortality risk from vehicle collisions is permanent for as long as the road is in use.

Increase in Public Access

Survival and Reproduction

Beavers may be adversely affected by improved public access during operations because this may lead to increased trapping pressures.

Beavers are important furbearers that may be trapped. Increased trapping mortality may correspond to an increase in access to the lands along the corridor. This effect may be particularly strong in areas adjacent to good beaver habitat, and around access roads and other construction and maintenance infrastructure. There are ten traplines that overlap the Local Study Area.

The potential increase in trapping and the corresponding increase in beaver mortality within the wildlife effects assessment Regional Study Area resulting from the increase in public access is not possible to predict because fur market prices and other unpredictable variables influence efforts expended on trapping.

9.4.3.4.14.2 Mitigation and Enhancement Measures

Habitat Loss and Alteration

Mitigation measures will be implemented to avoid, minimize, and restore the effects from habitat loss and alteration on beaver habitat availability, distribution, and survival and reproduction in the wildlife effects assessment Local Study Area and wildlife Regional Study Area.

A cleared width of less that 100 metres will be maintained unless otherwise required for operations. Vegetation clearing activities will be limited to the extent necessary for construction. All temporary construction infrastructure will be reclaimed as soon as possible following construction. Buffer zones of 30 metres will be maintained around waterbodies, clearing of riparian vegetation will be limited to the extent practicable and to the requirement of the access road and alignment clearing width only. Beaver lodges will be marked as sensitive sites and protected. A figure illustrating that location where beaver lodges were observed during existing conditions field surveys will be included in the Environmental Protection Plan. The Environmental Protection Plan will outline appropriate setbacks and procedures to be followed when beaver lodges are encountered during construction.

Temporary Project infrastructure used during construction only will be reclaimed as soon as possible following construction. An Environmental Protection Plan and a Cleanup and Reclamation Plan will be developed and implemented. Where necessary, seedling planting will occur to improve reclamation success on areas of temporary disturbance (for example, temporary access roads, laydown areas, camps, and workspaces) where habitat enhancement is identified. Reclamation plans will be confirmed through engagement with Indigenous communities, the Ministry of Natural Resources. Effectiveness of reclamation efforts will be monitored and managed post-construction, including confirmation that vegetation communities that naturally regenerate (or were planted) are similar to adjacent vegetation communities. If required, adaptive management will be employed to modify or enhance any reclamation efforts.

The effectiveness of mitigation measures will be evaluated during construction and operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Sensory Disturbance

Speed limits will be posted and enforced to reduce vehicle speeds and associated noise and dust emission levels.

These mitigation measures are expected to minimize the potential effects on beaver habitat. The effectiveness of mitigation measures will be evaluated during construction and postconstruction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Increase in Predator Access

To minimize ongoing attraction of predators to the Project area, roadkill will be cleaned up following best management practices outlined by Ontario's Ministry of Transportation and wildlife access to waste will be restricted. The ongoing use of inactive areas by predators will be minimized through physical control measures such as rollback, removal of creek crossings, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access.

Incidental Take

Mitigation measures described in construction will be applied during operations as required.

Collisions with Vehicles and Equipment

During operations, traffic will be restricted to approved right-of-way, workspace, and access roads or trails. Pits and quarries and other infrastructure required for maintenance activities will be gated to limit public access. A reporting protocol and system to report incidental wildlife observations and wildlife-vehicle collisions during construction and operations will be developed. Appropriate speed limits, wildlife crossing, and wildlife warning signage will be posted. Speed limits will be implemented and enforced.

The effectiveness of mitigation measures will be evaluated during construction and operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Increase in Public Access

During operations, the Community Access Road will be accessible to the public but access roads for aggregate areas and other infrastructure required for maintenance activities will be gated to limit public access. Employees will be prohibited from hunting or carrying firearms while working on Project maintenance.

The effectiveness of mitigation measures will be evaluated during construction and operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.3.4.14.3 Predicted Residual Effects

Habitat Loss and Alteration

The permanent loss of habitat represents less than 1.53 percent of the available moderate to high-quality beaver habitat within the wildlife effects assessment Local Study Area, which will have a small effect on habitat availability and is unlikely to have more than a slight effect on beaver populations or distribution in the effects assessment Local Study Area. There are residual effects predicted after implementation of the mitigation measures.

Effects are predicted to be certain, irreversible, and continuous. The direct effect of habitat loss will be confined to the Construction Disturbance Area. The effects of habitat loss and alteration will result in the fragmentation of contiguous habitat. The effects of fragmentation of habitat are predicted to occur at the scale of the Local Study Area.

After mitigation, the effects from habitat loss on the ability of the beaver populations in the wildlife Regional Study Areas to remain self-sustaining and ecologically functional are anticipated to be negative but **negligible** in magnitude.

Sensory Disturbance

Suitable beaver habitat may be indirectly removed or degraded due to sensory disturbance form the Project. However, beavers are known to have low sensitivity to sensory disturbances. While sound and light cannot be completely mitigated during a construction project, only a small proportion of the population of beavers within the effects assessment Regional Study Area are located near the effects assessment Construction Disturbance Area. The implementation of mitigation measures is expected to limit negative effects from sensory disturbance from the Project. However, there are predicted net residual effects on beaver.

Effects are predicted to be possible, continuous, medium-term and reversible during construction, permanent and irreversible during operations, and confined to the wildlife effects assessment Local Study Area. After mitigation, the effects from sensory disturbance on the ability of beaver populations in the wildlife effects assessment Regional Study Areas to remain self-sustaining and ecologically functional are expected to be negative but **negligible** in magnitude.

Increase in Predator Access

Mitigation, particularly of temporary access roads, will reduce the potential for the Project to cause interactions between beavers and other wildlife. The permanent road will provide a corridor that may be used by wolves and coyotes to expand their

presence in areas where they would have access to beavers as a prey resource. Both wolves and coyotes may alter the distribution of prey resources around the effects assessment Construction Disturbance Area. Changes to the movement of wolves and coyotes are expected to decline with distance from the Community Access Road, with the highest level of effect immediately surrounding the Construction Disturbance Area. There are residual effects predicted after implementation of the mitigation measures.

Effects are predicted to be irreversible, continuous, and confined to the wildlife effects assessment Local Study Area. After mitigation, the effects from increased predator access on the ability of beaver populations in the wildlife Regional Study Areas to remain self-sustaining and ecologically functional are expected to be negative but **negligible** in magnitude.

Incidental Take

During Operations, incidental take of beavers is possible if beaver dams or lodges need to be removed to maintain culverts. With mitigation, incidental take of beavers can be minimized or eliminated.

Effects of incidental take on beavers are predicted to be possible, permanent and irreversible during operations, infrequent, and confined to the Construction Disturbance Area. After mitigation, the effects from incidental take on the ability of beaver populations in the wildlife effects assessment Regional Study Areas to remain self-sustaining and ecologically functional are expected to be negative but **negligible** in magnitude.

Collisions with Vehicles and Equipment

Collisions with vehicles and equipment may affect the survival of some beavers during operations. Only a very small proportion of the beaver population within the Regional Study Area is likely to be located near the effects assessment Construction Disturbance Area, and collisions with vehicles and equipment are likely to affect only a small number of these beavers. There are residual effects predicted after implementation of the mitigation measures.

Effects are predicted to be possible, irreversible, continuous, and confined to the Construction Disturbance Area. After mitigation, the effects from collisions with vehicles and equipment on the ability of beaver populations in the wildlife effects assessment Regional Study Areas to remain self-sustaining and ecologically functional are expected to be negative but **negligible** in magnitude.

Increase in Public Access

During operations, access to beaver habitat near the Community Access Road will be permanently increased. An increase in trapping pressure may accompany this. Temporary access roads, even if they are blocked to road vehicles, may increase human accessibility on foot or by an all-terrain vehicle. A permanent increase in trapping pressure near the Community Access Road corridor is possible, with potential effects on beaver survival. Any increase in trapping mortality would decrease with distance from the Community Access Road and likely be highest for those animals whose home ranges are nearest the road. There are residual effects predicted after implementation of the mitigation measures.

After mitigation, the effects from increased public access on the ability of beaver populations in the wildlife Regional Study Areas to remain self-sustaining and ecologically functional are expected to be negative but **low** in magnitude.

9.4.3.4.15 Changes to Reptiles and Amphibians

9.4.3.4.15.1 Potential Effects

Habitat Loss and Alteration

Habitat Availability

Although habitat will be initially removed during construction, the effects on reptile and amphibian habitat availability from habitat loss will continue through Operations of the Project (such as, closure and reclamation of the road is not anticipated).

Parts of the effects assessment Construction Disturbance Area outside of the Community Access Road 60 metre right-of-way and within other areas of temporary construction disturbance may become reptile and amphibian habitat during operations. Maintenance activities with a high likelihood of disturbing reptile and amphibian habitat include reclearing along the Community Access Road 60 metre right-of-way, culvert maintenance and replacement, repairing damaged road surface, and grading.

Distribution

Although habitat will be initially removed during construction, the effects on reptile and amphibian distribution from habitat loss and alteration will continue through Operations of the Project (in other words, closure and reclamation of the road is not anticipated).

During operations, habitat along the corridor will remain cleared. Habitat fragmentation will have the same effect as during construction, though the permanent fragmentation may have additional effects.

Survival and Reproduction

Although habitat will be initially removed during construction, the effects on reptile and amphibian survival and reproduction from habitat loss and alteration will continue through Operations of the Project (in other words, closure and reclamation of the road is not anticipated).

Sensory Disturbance

Habitat Availability

Intermittent sensory disturbances may temporarily alter the amount of available habitat within the corridor during operations, particularly when maintenance activities are underway that involve significant sound production or use of nighttime lighting. These disturbances are likely to be limited to the immediate vicinity of maintenance operations and are unlikely to further reduce available habitat beyond construction activities.

Survival and Reproduction

Sensory disturbances will likely be present but different and less impactful during operations. It unlikely that there will be a measurable effect on reptile and amphibian survival and reproduction because of sensory disturbance from the Project during operations.

Incidental Take

Survival and Reproduction

There is also a potential effect on reptile and amphibian survival and reproduction during operations. Incidental take during maintenance activities is possible, especially during culvert maintenance and replacement where changes in standing water depths can cause incidental take of eggs and tadpoles. Other maintenance activities such as clearing vegetation from the corridor and grading also pose a risk of incidental take to reptiles and amphibians.

Collisions with Vehicles and Equipment

Effects on the survival and reproduction of reptiles and amphibians will continue to be likely during operations. Road operation may have the greatest magnitude of effect as public vehicles travelling along the Community Access Road are likely to be travelling at higher speeds than vehicles involved in construction or maintenance activities.

During Operations, traffic volumes are expected to be greatest on the north-south section of the Community Access Road compared to the east-west section that

connects to the Marten Falls First Nation. Specifically, the predicted average annual daily traffic volumes are 700 vehicles on the north-south section and 100 vehicles on the east-west section (Appendix W). Heavy trucks will make up over half (64 percent) of the traffic on the north-south section while the traffic on the east-west section will consists of 3 percent heavy trucks and the remaining as light-duty vehicles and medium-size trucks. Traffic volumes are expected to vary temporally and spatially, with a greater volume occurring in the south compared to northernmost portions of the Community Access Road where human density is lower. As a result, most of the reptile and amphibian-vehicle collisions that occur during operations are likely to be attributed to collisions with public and industry vehicles that are not associated with the Project.

9.4.3.4.15.2 Mitigation and Enhancement Measures

Habitat Loss and Alteration

The Project footprint was designed to avoid removal of amphibian breeding habitat as much as practicable, wetland habitat loss will be offset as part of a future offset plan. Over the long term, measures undertaken as part of the Preliminary Biodiversity Offset Plan (**Appendix AB**) would be implemented to achieve a net increase in functional amphibian breeding habitat.

The effectiveness of mitigation measures will be evaluated during construction and operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Sensory Disturbance

Speed limits will be posted and enforced to reduce vehicle speeds and associated noise and dust emission levels.

Incidental Take

Mitigation measures described above will be applied during operations as required.

Collisions with Vehicles and Equipment

During operations, traffic will be restricted to approved right-of-way, workspace, and access roads or trails. Pits and quarries and other infrastructure required for maintenance activities will be gated to limit public access. A reporting protocol and system to report incidental wildlife observations and wildlife-vehicle collisions during construction and operations will be developed. Speed limits will be implemented and enforced.

Additional mitigation during operations will include signage in areas where reptiles and amphibians are regularly observed.

The effectiveness of mitigation measures will be evaluated during construction and operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.3.4.15.3 Predicted Residual Effects

Habitat Loss and Alteration

A permanent loss of 2,095 hectares of suitable amphibian breeding habitat is expected, representing about 0.6 percent of the total suitable habitat within the effects assessment Regional Study Area. An effect on reptiles of similar extent is expected. The implementation of mitigation and enhancement measures is expected to limit negative effects. However, there are residual effects predicted after implementation of the mitigation measures.

The effect of habitat loss and alteration is considered negative, irreversible, continuous, and certain to occur. The direct effect of habitat loss will be confined to the Construction Disturbance Area. The effects of habitat loss and alteration will result in the fragmentation of contiguous habitat. The effects of fragmentation of habitat are predicted to occur at the scale of the Local Study Area.

After mitigation, the effects from habitat loss and alteration on the ability of reptile and amphibian populations in the wildlife Regional Study Areas to remain self-sustaining and ecologically functional are predicted to be **low** in magnitude.

Sensory Disturbance

Sound, vibration, and light from construction areas cannot be completely mitigated, and some level of sensory disturbance will still be present during construction. Most reptiles and amphibians are not considered to have high sensitivity to sensory disturbances, and the Construction Disturbance Area covers a relatively small percentage of the Local Study Area. However, sensory disturbance could result in decreased mating success for anurans if calling is reduced or degraded by noise disturbance.

There is a predicted residual effect after the implementation of mitigation measures described previously. Reduced reproductive capacity is possible among affected reptiles and amphibians with breeding habitat within the effects assessment wildlife Local Study Area.

The effect is considered negative, local to the wildlife effects assessment Local Study Area, medium-term and reversible during construction, permanent and irreversible

during operations, continuous, and probable to occur. After mitigation, the effects from sensory disturbance during construction of the Project on the ability of reptile and amphibian populations in the wildlife Regional Study Areas to remain self-sustaining and ecologically functional are predicted to be **negligible** in magnitude.

Incidental Take

Mitigation measures will reduce, but likely not eliminate the risk of incidental take of reptiles and amphibians during operations. Effects on mortality will be localized to work areas and transportation corridors and will likely include only a small number of animals.

During operations, incidental take may be largely caused by maintenance operations and chemical applications on the Community Access Road surface.

There is a predicted residual effect after implementation of the mitigation measures.

The effect is considered negative, confined to the Construction Disturbance Area, medium term, infrequent, during construction, permanent and irreversible during operations, and probable to occur. After the implementation of mitigation, the effects from incidental take on the ability of reptile and amphibian populations in the wildlife Regional Study Areas to remain self-sustaining and ecologically functional are predicted to be **low** in magnitude.

Collisions with Vehicles and Equipment

With mitigation, reptile and amphibian mortalities from collisions with vehicles and equipment during construction could be minimized. Reptile and amphibian mortalities resulting from vehicle collisions during operations are expected to occur. There is a predicted residual effect after the implementation of mitigation measures described previously.

During the next phase of the Project, in the Detail Design stage the incorporation of sub-surface eco-passages and exclusion fencing at strategic locations such as culverts, are predicted to partially mitigate the effect of collisions with vehicles and equipment during operations.

Implementation of mitigation measures are expected to be effective at minimizing the likelihood of reptile and amphibian collisions with Project vehicles and equipment during construction but are not expected to be as effective during operations because they will be less enforceable amongst public users of the Community Access Road. Because of this, effects are predicted to be probable during construction and certain during operations, irreversible, continuous, and confined to the Construction Disturbance Area. After mitigation, the effects from collisions with vehicles and equipment on the ability of

the reptile and amphibian populations in the wildlife effects assessment Regional Study Areas to remain self-sustaining and ecologically functional are anticipated to be negative but **low** in magnitude.

9.4.3.4.16 Changes to Pollinating Insects

9.4.3.4.16.1 Potential Effects

Habitat Loss and Alteration

Habitat Availability

Although habitat will be initially removed during construction, the effects on pollinating insect habitat availability from habitat loss will continue through Operations of the Project (in other words, closure and reclamation of the road is not anticipated). During operations, permanent clearing of the Community Access Road and associated maintenance infrastructure will maintain the loss of nesting habitat for bees and overwintering habitat for all insect species.

Distribution

Although habitat will be initially removed during construction, the effects on pollinating insect distribution from habitat loss will continue through Operations of the Project (in other words, closure and reclamation of the road is not anticipated).

During operations, some edge habitat will be established that may host shrubs that benefit bumble bees and lady beetles, but plant habitats will be lost within the Community Access Road and permanent maintenance infrastructure. The net effect of this change in habitat is unclear, but as a precautionary approach, it will be considered a net loss of habitat.

Survival and Reproduction

Pollinating insects are not limited by habitat availability in the wildlife effects assessment Local and Regional Study Areas and the small amount of vegetation removed for maintenance is unlikely to have a measurable effect on the survival or reproduction of pollinating insects during operations.

Sensory Disturbance

Habitat Availability and Survival and Reproduction

Sensory disturbance during construction and operations could result in the indirect loss or degradation of suitable pollinator habitat if individuals avoid areas with sensory

disturbance. The effects of noise and artificial light on pollinating insects are unknown. There is inconclusive evidence of whether bumble bees and lady beetles are considered sensitive to anthropogenic disturbances such as noise and light; however, current scientific understanding suggests that further research on the subject is required.

Incidental Take

During operations, incidental take of pollinating insects may occur during clearing along the edges of the Community Access Road corridor. Vegetation that provides habitat for insects as well as ground nests or overwintering spots may be removed by maintenance activities. However, this is unlikely to have a measurable effect on insect populations in the Regional Study Area.

Collisions with Vehicles and Equipment

During operations, public vehicle use of the Community Access Road poses the highest risk of incidental mortality to insects. Maintenance vehicles may also collide with insects during operations.

During Operations, traffic volumes are expected to be greatest on the north-south section of the Community Access Road compared to the east-west section that connects to the Marten Falls First Nation. Traffic volumes are expected to vary temporally and spatially, with a greater volume occurring in the south compared to northernmost portions of the Community Access Road where human density is lower. As a result, most of the pollinating insect-vehicle collisions that may occur during operations are likely to be attributed to collisions with public and industry vehicles that are not associated with the Project.

9.4.3.4.16.2 Mitigation and Enhancement Measures

Habitat Loss and Alteration

Mitigation measures will be implemented to avoid, minimize, and restore the effects from the Project on pollinating insect habitat availability, distribution, and survival and reproduction in the wildlife effects assessment Local Study Area and wildlife Regional Study Area.

The Project footprint will be limited to the extent feasible. Existing access roads will be used where possible. Decommission and rehabilitate temporary access roads, staging areas, camps, and debris and / or timber stockpiles following construction.

An Environmental Protection Plan and a Cleanup and Reclamation Plan will be developed and implemented. Where necessary, seedling planting will occur to improve

reclamation success on areas of temporary disturbance (for example, temporary access roads, laydown areas, camps, and workspaces) where habitat enhancement is identified. Reclamation plans will be confirmed through engagement with Indigenous communities, the Ministry of Natural Resources and local foresters. Effectiveness of reclamation efforts will be monitored and managed post-construction, including confirmation that vegetation communities that naturally regenerate (or were planted) are similar to adjacent vegetation communities. If required, adaptive management will be employed to modify or enhance any reclamation efforts.

Buffer zones of 30 metres will be maintained around waterbodies, clearing of riparian vegetation will be limited to the extent practicable and to the requirement of the access road and alignment clearing width only.

If seeding is necessary for reclamation of temporary construction infrastructure, a native plant seed mix will be used. Roadside ditches / rights-of-way present a mitigation opportunity for native pollinators. Through establishment of appropriate plant communities and implementation of Integrated Vegetation Management, a suitable forage habitat can be maintained while still performing the safety / functionality of rights-of-way (Wojcik and Buchmann, 2012; United States Environmental Protection Agency, 2008).

The effectiveness of mitigation measures will be evaluated during construction and operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Sensory Disturbance

Mitigation measures will be implemented to avoid, minimize, and restore the effects of sensory disturbance on pollinating insect habitat availability, and survival and reproduction in the wildlife effects assessment Local Study Area and wildlife Regional Study Area.

Although bumble bees and lady beetles may not be considered to be sensitive to sensory disturbances, mitigations for sensory disturbance in other valued components may benefit these species.

The effectiveness of mitigation measures will be evaluated during construction and operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Incidental Take

Mitigation measures described above will be applied during operations as required.

Collisions with Vehicles and Equipment

Operations traffic will be restricted to approved right-of-way, workspaces and access roads or trails. Speed limits will be implemented and enforced.

The effectiveness of mitigation measures will be evaluated during construction and operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.3.4.16.3 Predicted Residual Effects

Habitat Loss and Alteration

The Project will result in the removal of 4,700 hectares of mostly undisturbed natural habitat, the majority of which is vegetated and provides suitable nesting, overwintering and foraging resources for pollinating insects. This loss of habitat represents a small portion of the available habitat within the wildlife effects assessment Regional Study Area. There is a predicted residual effect after the implementation of mitigation measures described previously.

The effect is considered negative, irreversible, continuous, and certain to occur. The direct effect of habitat loss will be confined to the Construction Disturbance Area. The effects of habitat loss and alteration will result in the fragmentation of contiguous habitat. The effects of fragmentation of habitat are predicted to occur at the scale of the Local Study Area.

After mitigation, the effects from habitat loss and alteration on the ability of pollinating insect populations in the wildlife Regional Study Areas to remain self-sustaining and ecologically functional are predicted to be **negligible** in magnitude.

Sensory Disturbance

Bumble bees are tolerant to sensory disturbances such as sound and light. Lady beetles are not known to be sensitive to sensory disturbances. This effect is expected to have **no** effect on pollinating insects of concern during construction and operations. No residual effect of sensory disturbance on pollinating insects is predicted.

Incidental Take

Mitigation will reduce but not eliminate incidental take. The population of insects within the Construction Disturbance Area is expected to be a small fraction of the insects within the Local Study Area. There are residual effects predicted after implementation of the mitigation measures.

The effect is considered negative, local to the Construction Disturbance area, permanent and irreversible during operations, infrequent, and probable to occur. After mitigation, the effects from incidental take on the ability of pollinating insect populations in the wildlife effects assessment Regional Study Area to remain self-sustaining and ecologically functional are predicted to be **negligible** in magnitude.

Collisions with Vehicles and Equipment

Insect mortality will occur from collisions with vehicles and equipment during both construction and operations. It is unlikely that a large percentage of the pollinating insects within the effects assessment Regional Study Area will use the Community Access Road and consequently be subject to this risk. There are residual effects predicted after implementation of the mitigation measures.

The effect is considered negative, confined to the Construction Disturbance area, irreversible, continuous, and probable to occur. After mitigation, the effects from collisions with vehicles and equipment on the ability of pollinating insect populations in the wildlife Regional Study Areas to remain self-sustaining and ecologically functional are predicted to be **negligible** in magnitude.

9.4.3.5 Summary of Residual Effects

Table 9.4-9 provides a summary of the potential effects for wildlife, mitigation measures, and residual effects. Detailed information is included in **Appendix K**.

Table 9.4-9: Summary of Residual Effects for Wildlife

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **All Wildlife Valued Components**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Introduction and spread of invasive plant species—Can affect plant community composition, which can affect wildlife habitat availability and distribution.	• A comprehensive list of mitigation measures to control weeds during construction is provided in the Vegetation Technical Support Document (**Appendix J**) and Peatlands Technical Support Document (**Appendix I**). • Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources, will be followed during construction and operations.	• Residual changes from the introduction and spread of invasive plant species	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration: Short-term • Frequency: Infrequent • Reversibility: Reversible • Likelihood: Possible • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect
• **All Wildlife Valued Components**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Introduction and spread of invasive plant species—Can affect plant community composition, which can affect wildlife habitat availability and distribution.	• A comprehensive list of mitigation measures to control weeds during Operations is provided in the Vegetation Technical Support Document (**Appendix J**) and Peatlands Technical Support Document (**Appendix I**).	• Residual changes from the introduction and spread of invasive plant species	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration: Long-term • Frequency: Infrequent • Reversibility: Reversible • Likelihood: Possible • Significant: Not Significant • Uncertainty: Low • Direct / Indirect
• **All Wildlife Valued Components**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration	• Construction	• Emissions of criteria air contaminants—Deposition of particulates in criteria air contaminant emissions (for example, potential acid inputs) may change soil quality and vegetation and affect wildlife habitat availability and distribution.	• A comprehensive list of mitigation measures that will be implemented to limit dust deposition during construction is provided in the Atmospheric Environment Technical Support Document (**Appendix S**).	• No residual effect anticipated	• No residual effect anticipated

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
	• Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas					
• **All Wildlife Valued Components**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Emissions of criteria air contaminants—Deposition of particulates in criteria air contaminant emissions (for example, potential acid inputs) may change soil quality and vegetation and affect wildlife habitat availability and distribution.	• A comprehensive list of mitigation measures that will be implemented to limit dust deposition during Operations is provided in the Atmospheric Environment Technical Support Document (**Appendix S**).	• No residual effect anticipated	• No residual effect anticipated
• **All Wildlife Valued Components**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Temporary concrete batch plants • Pits and quarries • Drilling / blasting / aggregate production • Construction site restoration • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Fugitive dust emissions—Fugitive dust emissions and deposition may cause changes in soils and vegetation, which can adversely affect wildlife habitat availability and distribution.	• A comprehensive list of mitigation measures that will be implemented to limit dust deposition during construction is provided in the Atmospheric Environment Technical Support Document (**Appendix S**).	• Residual changes on wildlife habitat from fugitive dust emissions.	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration: Long-term • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Certain • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **All Wildlife Valued Components**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Fugitive dust emissions—Fugitive dust emissions and deposition may cause changes in soils and vegetation, which can adversely affect wildlife habitat availability and distribution.	• A comprehensive list of mitigation measures that will be implemented to limit dust deposition during Operations is provided in the Atmospheric Environment Technical Support Document (**Appendix S**).	• Residual changes on wildlife habitat from fugitive dust emissions.	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Certain • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect
• **All Wildlife Valued Components**	• Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls)	• Construction	• Erosion and sedimentation—Vegetation clearing, earth moving, pit and quarry development and other Project activities can result in the release of sediment, which may change the composition and function of vegetation communities and affect wildlife habitat availability and distribution.	• A comprehensive list of mitigation measures to limit changes from erosion and sedimentation during construction is provided in the Vegetation Technical Support Document (Appendix J) and the Surface Water Technical Support Document (**Appendix F**).	• No residual effect anticipated	• No residual effect anticipated
• **All Wildlife Valued Components**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Erosion and sedimentation—Vegetation clearing, earth moving, pit and quarry development and other Project activities can result in the release of sediment, which may change the composition and function of vegetation communities and affect wildlife habitat availability and distribution.	• A comprehensive list of mitigation measures to limit changes from erosion and sedimentation during Operations is provided in the Vegetation Technical Support Document (Appendix J), and the Surface Water Technical Support Document (**Appendix F)**.	• No residual effect anticipated	• No residual effect anticipated
• **All Wildlife Valued Components**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration	• Construction	• Changes to surface water quantity—Alteration of surface water drainage patterns, flows, and levels that can cause changes to soils and vegetation, which can affect wildlife habitat availability and distribution.	• A comprehensive list of mitigation measures to limit changes to surface water quantity during construction is provided in the Surface Water Technical Support Document (**Appendix F**). • Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources, will be followed during construction.	• No residual effect anticipated	• No residual effect anticipated

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
	• Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas					
• **All Wildlife Valued Components**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Changes to surface water quantity—Alteration of surface water drainage patterns, flows, and levels that can cause changes to soils and vegetation, which can affect wildlife habitat availability and distribution.	• A comprehensive list of mitigation measures to limit changes to surface water quantity during Operations is provided in the Surface Water Technical Support Document (**Appendix F**). • Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources, will be followed during Operations.	• No residual effect anticipated	• No residual effect anticipated
• **All Wildlife Valued Components**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Changes in surface water quality—Changes in surface water and groundwater quality from contact with the road surface and quarries could adversely affect wildlife habitat availability and distribution.	• A comprehensive list of mitigation measures to limit changes to surface water quality during construction is provided in the Surface Water Technical Support Document (**Appendix F**). • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Fisheries and Oceans Canada, Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• No residual effect anticipated	• No residual effect anticipated

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **All Wildlife Valued Components**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Changes in surface water quality—Changes in surface water and groundwater quality from contact with the road surface and quarries could adversely affect wildlife habitat availability and distribution.	• A comprehensive list of mitigation measures to limit changes to surface water quality during Operations is provided in the Surface Water Technical Support Document (**Appendix F**). • Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources, will be followed during Operations.	• No residual effect anticipated	• No residual effect anticipated
• **All Wildlife Valued Components**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Changes to groundwater — Changes in groundwater quality from Project activities could adversely affect wildlife habitat availability and distribution.	• A comprehensive list of mitigation measures to limit changes to groundwater quality during construction is provided in the Groundwater Technical Support Document (**Appendix H**). • Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources, will be followed during construction.	• Residual changes to wildlife from effects on groundwater quality	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration: Long-term • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Probable • Significant: Not Significant • Uncertainty: Moderate • Direct / Indirect: Direct
• **All Wildlife Valued Components**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Changes to groundwater — Changes in groundwater quality from Project activities could adversely affect wildlife habitat availability and distribution.	• A comprehensive list of mitigation measures to limit changes to groundwater quality during Operations is provided in the Groundwater Technical Support Document (**Appendix H**). • Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources, will be followed during Operations.	• Residual changes to wildlife from effects on groundwater quality	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration: Long-term • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Probable • Significant: Not Significant • Uncertainty: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **All Wildlife Valued Components**	• Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing	• Construction	• Increase in wildlife attractants—Attraction of wildlife to the Project site (for example, corvids to food waste or raptors to roadkill) may increase human-wildlife interactions and change predator-prey relationships, which can affect wildlife survival and reproduction.	• An Environmental Protection Plan will be developed and implemented that includes policies and actions anticipated to mitigate the attraction of wildlife to the Construction Disturbance Area, particularly near the temporary construction staging areas and temporary construction camps. • A Waste Management Plan will be developed and implemented that describe the appropriate management of solid, liquid and hazardous waste, including the following: – Construction-related garbage, debris, and surplus materials. – Hazardous materials such as used oil, filter and grease cartridges, lubrication containers. – Domestic garbage and camp waste (such as, food and grey water). Portable, secure, solid waste receptacles will be provided on work sites, temporary laydown areas and temporary construction camps and periodically emptied. • Construction staff will be educated about hazards of littering and feeding wildlife. A no littering policy will be implemented and enforced. • Feeding and harassment of wildlife on site will be prohibited. • De-icing salts will not be used on the unpaved Community Access Road during construction or operations. • Roadkill will be cleaned up during construction and operations following best management practices outlined by Ontario's Ministry of Transportation. • Collect domestic (for example, food) and industrial (for example, used oil and lubricants) waste and store temporarily in wildlife proof containers. Transport all waste offsite for recycling or disposal at a licensed disposal facility. • Potentially toxic materials that attract wildlife would be stored in secure areas inaccessible to wildlife (for example,	• Residual changes to wildlife from increased in wildlife attractants	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration: Long-term • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Possible • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				buildings, storage areas surrounded by wildlife-proof fencing), and toxic materials would be monitored continuously when removed from storage until they are used or returned to storage to prevent wildlife accessing and ingesting the materials. • Empty chemical toilets on site regularly by a licensed sewage-handling owner / operator.		
• **All Wildlife Valued Components**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Increase in wildlife attractants—Attraction of wildlife to the Project site (for example, corvids to food waste or raptors to roadkill) may increase human-wildlife interactions and change predator-prey relationships, which can affect wildlife survival and reproduction.	• Roadkill, debris, and waste management as per Ministry of Transportation's Debris Control Maintenance Quality Standard (MQS-331) and Ministry of Transportation's Rest Area / Picnic Site Maintenance Best Practice (MBP-325).	• Residual changes to wildlife from increased in wildlife attractants	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration: Long-term • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Possible • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Direct
• **All Wildlife Valued Components**	• Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Pits and quarries • Drilling / blasting / aggregate production	• Construction	• Blasting and associated fly rock—May result in injury or mortality to wildlife.	• A comprehensive list of mitigation measures to minimize effects from blasting during construction is provided in the Acoustic and Vibration Environment Technical Support Document (Appendix P). • An Environmental Protection Plan will be implemented that includes policies and actions for avoiding and minimizing the risks of blasting and blasting materials to wildlife. • Blasting work will be completed as quickly as possible to shorten the duration of disturbance. • Quarry blasting, rock crushing and screening, the use of heavy equipment, and other activities that generate loud noises will not be permitted within four kilometres of wolverine dens or suspected wolverine denning sites during the wolverine denning season (January 15 to May 31). If timing windows cannot be adhered to, follow environmental approval conditions, permits, or authorizations issued for the Project, including those	• No residual effect anticipated	• No residual effect anticipated

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources. • Open excavations and blasting areas will be fenced off if left unsupervised to avoid injury and mortality of wildlife. • A buffer zone will be placed around the perimeter of blasting activities and surrounding forested habitat as described in the Blasting Management Plan.		
• **All Wildlife Valued Components**	• Maintenance	• Operations	• Blasting and associated fly rock—May result in injury or mortality to wildlife.	• A comprehensive list of mitigation measures that will be implemented during Operations is provided in Acoustic and Vibration Environment Technical Support Document (Appendix P). • Blasting will be suspended within 4 kilometres of known or potential wolverine denning areas during the denning period to minimize sensory disturbances (January 15 to May 31). If timing windows cannot be adhered to, follow environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• No residual effect anticipated	• No residual effect anticipated
• **All Wildlife Valued Components**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Rehabilitation (progressive and final) and surrender of pits and quarries in	• Construction	• Chemical or hazardous material stored on the Project site, or spills—(for example, petroleum products, ammonium nitrate) on site or along access or haul roads can affect wildlife survival and reproduction.	• Adhere to federal and provincial regulations and guidelines regarding hazardous substance collection and storage, use and handling, and disposal and treatment, such as the *Transportation of Dangerous Goods Act* (Government of Canada, 1992), *Dangerous Goods Transportation Act* (Government of Ontario, 1990j), and the *Environmental Protection Act* (Government of Ontario, 1990e). • Mitigation measures described in the Surface Water Technical Support Document (**Appendix F**), Groundwater Technical Support Document (**Appendix H**), Physiography, Terrain, and Soils Technical Support Document (**Appendix N**), and Vegetation Technical Support	• No residual effect anticipated	• No residual effect anticipated

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
	accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas			Document (**Appendix J**) will be implemented to minimize effects from chemical and hazardous material spills in the wildlife effects assessment Local Study Area during construction.		
• **All Wildlife Valued Components**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Chemical or hazardous material stored on the Project site, or spills—(for example, petroleum products, ammonium nitrate) on site or along access or haul roads can affect wildlife survival and reproduction.	• Adhere to federal and provincial regulations and guidelines regarding hazardous substance collection and storage, use and handling, and disposal and treatment, such as the *Transportation of Dangerous Goods Act* (Government of Canada, 1992), *Dangerous Goods Transportation Act* (Government of Ontario, 1990j), and the *Environmental Protection Act* (Government of Ontario, 1990e). • Mitigation measures described in the Surface Water Technical Support Document (**Appendix F**), Groundwater Technical Support Document (**Appendix H**), Physiography, Terrain, and Soils Technical Support Document (**Appendix N**), and Vegetation Technical Support Document (**Appendix J**) will be implemented to minimize effects from chemical and hazardous material spills in the wildlife effects assessment Local Study Area during Operations.	• No residual effect anticipated	• No residual effect anticipated
• **Bats (little brown myotis and northern myotis)**	• Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Pits and quarries • Temporary concrete batch plants • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls)	• Construction	• Habitat loss and alteration—Habitat loss is the direct removal or alteration of soil and vegetation that may change habitat availability and use, and influence bat abundance and distribution.	• Limit the project footprint to the extent feasible. • Retain compatible species (for example, shrub vegetation, compatible trees, and coarse woody debris) where practicable and where safe to do so. • Avoid clearing maternity roost habitat during the bat maternity roosting period (May 1 September 30). If potential maternity roost habitat is to be removed during the roosting period, it will be subject to the *Endangered Species Act* permitting requirements and site-specific mitigation measures that would be developed in consultation with the Ministry of the Environment, Conservation and Parks Species at Risk Branch. All appropriate permits for this work will be acquired in consultation with the Ministry	• Residual changes to wildlife from habitat loss and alteration	• Context: Ecological • Direction: Negative • Magnitude: Low • Geographic Extent: Construction Disturbance Area (direct habitat loss) / Local Study Area (habitat fragmentation) • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Certain • Significant: Not Significant • Uncertainty: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				of the Environment, Conservation and Parks Species at Risk Branch. • Temporary access roads and trails, construction camps, turnaround areas, waterbody crossings and temporary laydown areas will be reclaimed at the end of construction. • Buffer zones of 30 metres will be maintained around waterbodies, clearing of riparian vegetation will be limited to the extent practicable and to the requirement of the access road and alignment clearing width only. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources. • An Environmental Protection Plan and a Cleanup and Reclamation Plan will be developed and implemented. Where necessary, seedling planting will occur to improve reclamation success on areas of temporary disturbance (for example, temporary access roads, laydown areas, camps, and workspaces) where habitat enhancement is identified. Reclamation plans will be confirmed through engagement with Indigenous communities, the Ministry of Natural Resources, the Ministry of the Environment, Conservation and Parks Species at Risk Branch, and local foresters. Effectiveness of reclamation efforts will be monitored and managed post-construction, including confirmation that vegetation communities that naturally regenerate (or were planted) are similar to adjacent vegetation communities. If required, adaptive management will be employed to modify or enhance any reclamation efforts.		

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Bats (little brown myotis and northern myotis)**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Habitat loss and alteration—Habitat loss is the direct removal or alteration of soil and vegetation that may change habitat availability and use, and influence bat abundance and distribution.	• A Preliminary Biodiversity Offset Plan (**Appendix AB**) has been developed to offset little brown myotis and northern myotis habitat loss. As the Biodiversity Offset Plan is developed, it is anticipated that artificial bat roost structures will be installed within temporary disturbance areas and in appropriate areas within the effects assessment Local Study Area to mitigate the removal of tree roosts for little brown myotis and northern myotis. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources. • During highway maintenance, Ministry of Transportation's Best Management Practices for Species at Risk Protection During Maintenance Activities (Ministry of Transportation, 2017a) will be considered and included in the development of the Environmental Protection Plan.	• No residual effects anticipated	• No residual effects anticipated
• **Bats (little brown myotis and northern myotis)**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Pits and quarries • Drilling / Blasting / Aggregate Production	• Construction	• Sensory disturbance—Sensory disturbance (for example, lights, smells, noise, human activity) can alter bat habitat availability, use, and connectivity (movement and behaviour), which can lead to changes in habitat availability and distribution and adversely affect survival and reproduction.	• The use of nighttime lighting around bat roosting areas will be minimized to the extent possible during construction. The idling of construction vehicles and equipment will be limited. Night work will be avoided where feasible. • Mitigation measures such as restricting tree clearing within bat maternity roost habitat during the maternity roost season (May 1 to September 30) is expected to avoid and limit sensory disturbance on maternity colonies. If potential maternity roost habitat is to be removed during the roosting period, it will be subject to *Endangered Species Act* permitting requirements and site-specific mitigation measures that would be developed in consultation with the Ministry of the Environment Conservation and Parks,	• Residual changes to bats from sensory disturbance	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration: Medium-term • Frequency: Continuous until Construction is over • Reversibility: Reversible • Likelihood: Probable • Significant: Not Significant • Uncertainty: Moderate • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				Species at Risk Branch. Mitigation will include pre-clearing surveys to determine if potential maternity roost trees are present in the area to be cleared. All appropriate permits for this work will be acquired in consultation with the Ministry of the Environment Conservation and Parks, Species at Risk Branch. • Restricting construction traffic to designated areas. • During construction, access to the Community Access Road corridor will be restricted to construction personnel. • Control lighting required for Construction, including direction and timing to avoid effects on bats, while meeting operational health and safety requirements. • Noise-producing equipment will be fitted with noise-reducing components, where feasible, and these components will be maintained. • Wildlife awareness training will be provided for road construction workers to reduce vehicle speeds and associated noise and dust emission levels. • Industry best practices will be used for blasting activities, including scheduling when in the vicinity of sensitive wildlife sites. • Vegetation buffers will be retained around quarries to reduce noise, where feasible. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.		

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Bats (little brown myotis and northern myotis)**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Sensory disturbance—Sensory disturbance (for example, lights, smells, noise, human activity) can alter bat habitat availability, use, and connectivity (movement and behaviour), which can lead to changes in habitat availability and distribution and adversely affect survival and reproduction.	• Speed limits will be posted and enforced to reduce vehicle speeds and associated noise. • Control lighting required for Operation of the Project, including direction and timing to avoid effects on bats, while meeting operational health and safety requirements. • Owner/operator employed to conduct maintenance activities will follow the same mitigation as outlined for construction • A Preliminary Biodiversity Offset Plan (**Appendix AB**) will be developed to achieve no net loss of little brown myotis and northern myotis habitat. Over the long term, measures undertaken as part of the Preliminary Biodiversity Offset Plan would be implemented to achieve a net increase in functional bat habitat relative to existing conditions. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources. • During highway maintenance, Ministry of Transportation's Best Management Practices for Species at Risk Protection During Maintenance Activities (Ministry of Transportation, 2017a) will be considered and included in the development of the Environmental Protection Plan.	• Residual changes to bats from sensory disturbance	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Probable • Significant: Not Significant • Uncertainty: Moderate • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Bats (little brown myotis and northern myotis)**	• Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Pits and quarries	• Construction	• Incidental take—The direct removal or alteration of maternity roost trees or hibernacula.	• Minimize habitat loss and alteration to the extent possible. • Clearing and grubbing in areas with potential bat roosting habitat will be undertaken outside of the summer roosting period (May 1 to September 30). If clearing or grubbing are required during the summer roosting period, the Ministry of Environment, Conservation, and Parks Species at Risk Branch will be engaged. Depending on the outcome of the discussion with the Ministry of Environment, Conservation, and Parks, exit surveys may be conducted prior to clearing in very limited areas. Surveys would be conducted to search the Construction Disturbance Area for trees that could provide roosts for little brown myotis and northern myotis (candidate roost trees). Candidate roost trees are defined as trees greater than ten centimetres diameter at 1.3 metres above the ground, with exfoliating bark, cracks, cervices or cavities. Any candidate roost trees will be flagged for avoidance during the summer roosting period. Clearing will not be undertaken in areas with occupied roosting habitat. • Environmental training for workers will include information on species at risk bat roost identification and procedures to follow if a potential bat roost is identified. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• Residual changes to bats from incidental take	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration: Medium-term • Frequency: Infrequent • Reversibility: Irreversible • Likelihood: Unlikely • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Bats (little brown myotis and northern myotis)**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Incidental take—The direct removal or alteration of maternity roost trees or hibernacula.	• Minimize habitat loss and alteration to the extent possible. • Clearing and grubbing in areas with potential bat roosting habitat will be undertaken outside of the summer roosting period (May 1 to September 30). If clearing or grubbing are required during the summer roosting period, the Ministry of the Environment, Conservation and Parks, Species at Risk Branch will be engaged. Depending on the outcome of the discussion with the Ministry of Environment, Conservation, and Parks, exit surveys may be conducted prior to clearing in very limited areas. Clearing will not be undertaken in areas with occupied roosting habitat. • Environmental training for workers will include information on species at risk bat roost identification and procedures to follow if a potential bat roost is identified. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources. • During highway maintenance, Ministry of Transportation's Best Management Practices for Species at Rusk Protection During Maintenance Activities (Ministry of Transportation, 2017a) will be considered and included in the development of the Environmental Protection Plan.	• No residual change anticipated	• No residual change anticipated

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Bats (little brown myotis and northern myotis)**	• Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Pits and quarries	• Construction	• Collisions with vehicles and equipment—Collisions with Project vehicles during construction and operations may cause injury or mortality to individual animals.	• Implement an Environmental Protection Plan that includes the following measures to minimize collisions between wildlife and vehicles during construction. • Minimize habitat loss and alteration to the extent possible. Avoiding high-quality habitats and sensitive areas for bat species at risk, to the extent feasible. • Provide driver training to construction workers to understand the importance of reducing vehicle speeds, spread awareness of local wildlife, give wildlife the right-of-way, communicate the presence of wildlife along access roads and on site to other employees, and mandatory reporting of wildlife collisions. • Signage will be posted in areas where wildlife are regularly observed. • Worker transportation to site will be coordinated to reduce traffic volumes. • Employees and owner / operators will be subject to restrictions while working including prohibition of personal snowmobiles, all-terrain vehicles and other motorized recreational vehicles; and speeding on roads. Confining vehicle traffic to approved right-of-way, workspace, and access roads. • A reporting protocol and system will be developed to report incidental wildlife observations and wildlife-vehicle collisions during construction. • Blocking winter roads and temporary access routes and trails no longer required during construction. • Incorporating standard safe road design configurations and construction methods in the detail design. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• Residual changes to bats from collisions with vehicles and equipment	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration: Permanent • Frequency: Continuous until Construction is over • Reversibility: Irreversible • Likelihood: Possible • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Bats (little brown myotis and northern myotis)**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Collisions with vehicles and equipment—Collisions with Project vehicles during construction and operations may cause injury or mortality to individual animals.	• Speed limits will be posted and enforced to reduce vehicle speeds and associated collisions with wildlife. • Signage will be posted where the road crosses the Albany River and the Ogoki River (important bat flyways) to notify motorists of the elevated risk of collisions with bats in these area at night between May and November to encourage reduced travel speeds during that time. • Operations traffic will be restricted to approved right-of-way, workspace and access roads or trails. • Implement an Environmental Protection Plan that includes the following measures to minimize collisions between wildlife and vehicles during Maintenance. • Provide driver training to Maintenance workers to understand the importance of reducing vehicle speeds, spread awareness of local wildlife, give wildlife the right-of-way, communicate the presence of wildlife along access roads and on site to other employees, and mandatory reporting of wildlife collisions. • Signage will be posted in areas where wildlife are regularly observed. • Worker transportation to site will be coordinated to reduce traffic volumes. • Employees and owner / operators will be subject to restrictions while working including prohibition of personal snowmobiles, all-terrain vehicles and other motorized recreational vehicles; and speeding on roads. Confining vehicle traffic to approved right-of-way, workspace, and access roads. • A reporting protocol and system will be developed to report incidental wildlife observations and wildlife-vehicle collisions during Operations. • Blocking winter roads and temporary access routes and trails no longer required as Maintenance proceeds. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the	• Residual changes to bats from collisions with vehicles and equipment	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Possible • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources. • During highway maintenance, Ministry of Transportation's Best Management Practices for Species at Rusk Protection During Maintenance Activities (Ministry of Transportation, 2017a) will be considered and included in the development of the Environmental Protection Plan.		
• **Furbearers (wolverine)**	• Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Pits and quarries • Temporary concrete batch plants • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls)	• Construction	• Habitat loss and alteration—Habitat loss is the direct removal or alteration of soil and vegetation that may change habitat availability, use, and connectivity and influence wolverine abundance and distribution.	• Limit the Project footprint to the extent feasible. • Use existing access roads where possible. • A cleared width of less that 100 metres will be maintained unless otherwise required for construction • Clearing and grubbing will be conducted outside of the wolverine denning period (January 15 to May 31). • If clearing or grubbing must occur during the wolverine denning period, areas with potential dens will be surveyed prior to construction activities. The details of the wolverine aerial survey methods will be described in the Environmental Protection Plan. Construction activities will not be conducted within four kilometres of active wolverine dens during the denning period. • Buffer zones of 30 metres will be maintained around waterbodies, clearing of riparian vegetation will be limited to the extent practicable and to the requirement of the access road and alignment clearing width only. • Quarry blasting, rock crushing and screening, the use of heavy equipment, and other activities that generate loud noises will not be permitted within four kilometres of wolverine dens or suspected wolverine denning areas during the wolverine denning season.	• Residual changes to wolverine from habitat loss	• Context: Ecological • Direction: Negative • Magnitude: Moderate • Geographic Extent: Construction Disturbance Area (direct habitat loss) / Local Study Area (habitat fragmentation, indirect effects from road avoidance) • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Certain • Significant: Significant • Uncertainty: High • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				• If any periodic quarry operations planned to occur during the denning period, these activities will be preceded by wolverine den surveys conducted within four kilometres of quarry operations. Quarry operations will not be conducted within 4 kilometres of active wolverine dens during the denning period. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources. • Temporary access roads and trails, construction camps, turnaround areas, waterbody crossings and temporary laydown areas will be reclaimed at the end of construction. • An Environmental Protection Plan and a Cleanup and Reclamation Plan will be developed and implemented. Where necessary, seedling planting will occur to improve reclamation success on areas of temporary disturbance (for example, temporary access roads, laydown areas, camps, and workspaces) where habitat enhancement is identified. Reclamation plans will be confirmed through engagement with Indigenous communities, the Ministry of Natural Resources, the Ministry of the Environment, Conservation and Parks Species at Risk Branch and local foresters. Effectiveness of reclamation efforts will be monitored and managed post-construction, including confirmation that vegetation communities that naturally regenerate (or were planted) are similar to adjacent vegetation communities. If required, adaptive management will be employed to modify or enhance any reclamation efforts.		

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Furbearers (wolverine)**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Habitat loss and alteration—Habitat loss is the direct removal or alteration of soil and vegetation that may change habitat availability, use, and connectivity and influence wolverine abundance and distribution.	• Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources. • During highway maintenance, Ministry of Transportation's Best Management Practices for Species at Risk Protection During Maintenance Activities (Ministry of Transportation, 2017a) will be considered and included in the development of the Environmental Protection Plan.	• No residual effect anticipated	• No residual effect anticipated
• **Furbearers (wolverine)**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Pits and quarries • Drilling / blasting / aggregate production	• Construction	• Sensory disturbance—Sensory disturbance (for example, lights, smells, noise, human activity) can alter wildlife habitat availability, use, and connectivity (movement and behaviour), which can lead to changes in abundance and distribution and adversely affect survival and reproduction.	• Mitigation measures such as restricting tree clearing and vegetation removal within wolverine denning season (January 15 to May 31) are expected to avoid and limit sensory disturbance on maternal dens (additional details are provided under incidental take). • All construction activities that produce sensory disturbance will be avoided within 4 kilometres of active wolverine dens. • Construction traffic will be restricted to designated areas. • During construction, access to the Community Access Road corridor will be restricted to construction personnel. • Noise-producing equipment will be fitted with noise-reducing components, where feasible, and these components will be maintained. • Unnecessary idling of vehicles and equipment will be limited on construction sites. • Wildlife awareness training will be provided for road construction workers to reduce vehicle speeds and associated noise and dust emission levels. • Industry best practices will be used for blasting activities, including scheduling when in the vicinity of sensitive wildlife sites.	• Residual changes to wolverines from sensory disturbance	• Context: Ecological • Direction: Negative • Magnitude: Moderate • Geographic Extent: Local • Duration: Medium term • Frequency: Continuous • Reversibility: Reversible • Likelihood: Certain • Significant: Not Significant • Uncertainty: High • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				• Vegetation buffers will be retained around quarries to reduce noise, where feasible. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.		
• **Furbearers (wolverine)**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Sensory disturbance—Sensory disturbance (for example, lights, smells, noise, human activity) can alter wildlife habitat availability, use, and connectivity (movement and behaviour), which can lead to changes in abundance and distribution and adversely affect survival and reproduction.	• Quarry blasting, rock crushing and screening, the use of heavy equipment and other activities that generate loud noises will not be permitted within four kilometres of wolverine dens or suspected wolverine denning areas during the wolverine denning season (January 15 to May 31). • If any periodic quarry operations planned to occur during the denning period, these activities will be preceded by wolverine den surveys conducted within 4 kilometres of quarry operations. The details of the wolverine aerial survey methods will be described in the Environmental Protection Plan. Quarry operations will not be conducted within 4 kilometres of active wolverine dens during the denning period. • Speed limits will be posted and enforced to reduce vehicle speeds and associated noise. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources. • During highway maintenance, Ministry of Transportation's Best Management Practices for Species at Risk Protection During Maintenance Activities (Ministry of Transportation, 2017a) will be considered and included in the development of the Environmental Protection Plan.	• Residual changes to wolverines from sensory disturbance	• Context: Ecological • Direction: Negative • Magnitude: Moderate • Geographic Extent: Local • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible during Operations • Likelihood: Certain • Significant: Not Significant • Uncertainty: High • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Furbearers (wolverine)**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Pits and quarries • Temporary concrete batch plants • Drilling / blasting aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Increase in predator access—Increased access for predators (for example, coyote, wolf and black bear) may increase competition for prey and may increase predation risk and decrease survival and reproduction for wolverine.	• The Project footprint is designed to minimize vegetation clearing and access road requirements to the extent feasible (for example, concentrate temporary activities spatially, retain habitat outside of scoped Construction Disturbance Area, restrict construction vehicle traffic to established access roads where feasible). • Restrict wildlife access to waste (for example, collect domestic and industrial waste and store in temporary containers until transported offsite, empty chemical toilets regularly, prohibit littering, prohibit feeding and harassment of wildlife). • Design and construct temporary linear features to decrease predator efficiency (for example, retain vegetation under 2 metres, minimize width of linear features, switch backs and bends in temporary road construction), and reduce predator mobility (for example, not removing snow unless necessary). • During construction, the ongoing use of inactive areas by predators will be minimized through physical control measures such as rollback, removal of creek crossings, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access. • To minimize ongoing attraction of predators to the Project area, road kill will be cleaned up following best management practices outlined by Ontario's Ministry of Transportation and wildlife access to waste will be restricted. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources. • Progressive reclamation and revegetation would be implemented as non-permanent features would be decommissioned and reclaimed or revegetated naturally.	• Residual changes to wolverine form increase predator access	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration: Long term • Frequency: Continuous • Reversibility: Reversible (for access roads that become revegetated) • Likelihood: Possible • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Furbearers (wolverine)**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Increase in predator access—Increased access for predators (for example, coyote, wolf and black bear) may increase competition for prey and may increase predation risk and decrease survival and reproduction for wolverine.	• Restrict wildlife access to waste (for example, collect domestic and industrial waste and store in temporary containers until transported offsite, empty chemical toilets regularly, prohibit littering, prohibit feeding and harassment of wildlife). • During Operations, the ongoing use of inactive areas by predators will be minimized through physical control measures such as rollback, removal of creek crossings, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access. • To minimize ongoing attraction of predators to the Project area, road kill will be cleaned up following best management practices outlined by Ontario's Ministry of Transportation and wildlife access to waste will be restricted. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources. • During highway maintenance, Ministry of Transportation's Best Management Practices for Species at Risk Protection During Maintenance Activities (Ministry of Transportation, 2017a) will be considered and included in the development of the Environmental Protection Plan.	• Residual changes to wolverine form increase predator access	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible (for the all-season Community Access Road and permanent access roads) • Likelihood: Possible • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Furbearers (wolverine)**	• Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Pits and quarries	• Construction	• Incidental take—Vegetation removal and soil alterations during site preparation for construction, may result in destruction of dens, abandonment of dens and affect the survival and reproductive success of wolverine.	• Minimize habitat loss and alteration to the extent possible. • Clearing and grubbing in areas with potential wolverine den sites will take place outside of the wolverine denning season (January 15 to May 31). If clearing or grubbing are required during the winter denning period, surveys for the presence of wolverine dens will be conducted prior to clearing. The details of the wolverine aerial survey methods will be described in the Environmental Protection Plan Clearing will not be undertaken within 4 kilometres of areas with occupied wolverine dens. • Quarry blasting, rock crushing and screening, the use of heavy equipment, and other activities that generate loud noises will not be permitted within four kilometres of wolverine dens or suspected wolverine denning areas during the wolverine denning season. • Environmental training for workers will include information on wolverine den identification and procedures to follow if a den is identified. • Herbicides or pesticides will not be used at any stage of the Community Access Road construction. • Effects on denning areas will be minimized to the extent possible. Areas with potential to support wolverine denning will be identified through a review of plant community mapping (looking for communities that may contain the microhabitat features (for example, fallen trees and blowdown, boulders and variable terrain) that wolverine require for denning), and targeted aerial site reconnaissance during the same denning period that construction activities are planned to survey for signs of potential denning areas prior to the initiation of Construction (for example, clearing and grubbing).	• Residual changes to wolverine from incidental take	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible (for the all-season Community Access Road and permanent access roads) • Likelihood: Possible • Significant: Not Significant • Uncertainty: High • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				• If a wolverine den is identified during construction, and should this timing not be able to be maintained within the buffer widths identified (4 kilometres), local Ministry Environment Conservation and Parks' Species at Risk Branch offices will be contacted to develop a den management plan and appropriate Indigenous communities will be notified, where requested. The Project will avoid activities within four kilometres of the den during the denning period that would adversely affect wolverine or seek and authorization under the ESA or SCA as appropriate, prior to conduction activities. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.		
• **Furbearers (wolverine)**	• Operate the Preferred Route • Maintain the Preferred Route • Period quarry blasting	• Operations	• Incidental take—Vegetation removal and soil alterations during site preparation for constructions activities, may result in destruction of dens, abandonment of dens and affect the survival and reproductive success of wolverine	• Minimize habitat loss and alteration to the extent possible. • Clearing and grubbing in areas with potential wolverine den sites will take place outside of the wolverine denning season (January 15 to May 31). If clearing or grubbing are required during the winter denning period, surveys for the presence of wolverine dens will be conducted prior to clearing. The details of wolverine aerial survey methods will be described in the Environmental Protection Plan Clearing will not be undertaken within 4 kilometres of areas with occupied wolverine dens. • Quarry blasting, rock crushing and screening, the use of heavy equipment, and other activities that generate loud noises will not be permitted within four kilometres of wolverine dens or suspected wolverine denning areas during the wolverine denning season.	• No residual effect anticipated	• No residual effect anticipated

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				• Environmental training for workers will include information on wolverine den identification and procedures to follow if a den is identified. • Herbicides or pesticides will not be used during the Community Access Road Operations phase. • Effects onto denning areas will be minimized to the extent possible. Areas with potential to support wolverine denning will be identified through a review of plant community mapping (looking for communities that may contain the microhabitat features (for example, fallen trees and blowdown, boulders and variable terrain) that wolverine require for denning), and targeted aerial site reconnaissance during the same denning period that construction activities are planned to survey for signs of potential denning areas well prior to the initiation of Construction (for example, clearing and grubbing). • If a wolverine den is identified during Operations, and should this timing not be able to be maintained within the buffer widths identified (4 kilometres), local Ministry of the Environment, Conservation and Parks' Species at Risk Branch offices will be contacted to develop a den management plan and appropriate Indigenous communities will be notified, where requested. The Project will avoid activities within four kilometres of the den during the denning period that would aversely affect wolverine or seek and authorization under the *Endangered Species Act*, 2007 or Species Conservation Act, as appropriate, prior to conduction activities. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the		

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				Environment, Conservation and Parks, and Ontario Ministry of Natural Resources. • During highway maintenance, Ministry of Transportation's Best Management Practices for Species at Risk Protection During Maintenance Activities (Ministry of Transportation, 2017a) will be considered and included in the development of the Environmental Protection Plan.		
• **Furbearers (wolverine)**	• Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Pits and quarries	• Construction	• Collisions with vehicles and equipment—Collisions with Project vehicles during construction and operations may cause injury or mortality to individual animals.	• Implement an Environmental Protection Plan that includes the following measures to minimize collisions between wildlife and vehicles during construction: provide driver training to Construction workers to understand the importance of reducing vehicle speeds, spread awareness of local wildlife, give wildlife the right-of-way, communicate the presence of wildlife along access roads and on site to other employees, and mandatory reporting of wildlife collisions. • Signage will be posted in areas where wildlife is regularly observed. • Worker transportation to site will be coordinated to reduce traffic volumes. • Employees and owner / operators will be subject to restrictions while working including prohibition of personal snowmobiles, all-terrain vehicles and other motorized recreational vehicles; and speeding on roads. Confining vehicle traffic to approved right-of-way, workspace, and access roads. • At watercourse crossings that occur within wolverine high-use areas and are on the north-south segment of the Preferred Route (WA-11, WA-15 and WA-18), modified bridge and bridge embankments will be designed to incorporate terrestrial pathways adjacent to the aquatic habitat and allow for safe wildlife passage, where feasible given land cover considerations. These design features include increasing the height of bridge to minimum 4 metres vertical	• Residual changes to wolverine from collisions with vehicles and equipment	• Context: Ecological • Direction: Negative • Magnitude: Low • Geographic Extent: Construction Disturbance Area • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Possible • Significant: Not Significant • Uncertainty: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				clearance, using natural substrates on the bridge embankments, and allowing for an unobstructed line of sight on either side of the bridge. • Wildlife passage modifications to other bridge designs, including bridges that occur on the east-west trending segment of the Community Access Road, will be considered in future design phases. • Pits and quarries and other infrastructure required for maintenance activities will be gated to limit public access. • A reporting protocol and system will be developed to report incidental wildlife observations and wildlife-vehicle collisions during construction. • De-icing salts will not be used on the unpaved Community Access Road during construction or Operations. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.		
• **Furbearers (wolverine)**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Collisions with vehicles and equipment—Collisions with Project vehicles during construction and operations may cause injury or mortality to individual animals.	• Speed limits will be posted and enforced to reduce vehicle speeds and associated collisions with wildlife. • Operations traffic will be restricted to approved right-of-way, workspace and access roads or trails. • Implement an Environmental Protection Plan that includes the following measures to minimize collisions between wildlife and vehicles during Maintenance: provide driver training to Maintenance workers to understand the importance of reducing vehicle speeds, spread awareness of local wildlife, give wildlife the right-of-way, communicate the presence of wildlife along access roads and on site to other employees, and mandatory reporting of wildlife collisions.	• Residual changes to wolverine from collisions with vehicles and equipment	• Context: Ecological • Direction: Negative • Magnitude: Moderate • Geographic Extent: Construction Disturbance Area • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Possible • Significant: Significant • Uncertainty: High • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				• Signage will be posted in areas where wildlife are regularly observed. • Worker transportation to site will be coordinated to reduce traffic volumes. • Employees and owner / operators will be subject to restrictions while working including prohibition of personal snowmobiles, all-terrain vehicles and other motorized recreational vehicles; and speeding on roads. Confining vehicle traffic to approved right-of-way, workspace, and access roads. • A reporting protocol and system will be developed to report incidental wildlife observations and wildlife-vehicle collisions during Operations. • Blocking winter roads and temporary access routes and trails no longer required as Maintenance proceeds. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources. • During highway maintenance, Ministry of Transportation's Best Management Practices for Species at Risk Protection During Maintenance Activities (Ministry of Transportation, 2017a) will be considered and included in the development of the Environmental Protection Plan.		

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Furbearers (wolverine)**	• Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Increase in public access—Could affect wolverine survival and reproduction through increased trapping efforts.	• Access roads used for permanent maintenance activities will be blocked while not in use. • Employees will be prohibited from hunting or carrying firearms while working on the Project maintenance. • Implement an Environmental Protection Plan that includes the following measures to control, and / or restrict public use of access roads during construction: speed limits, gates / manned gates, signage, reduced road standard, felling of timber across temporary access roads after reclaimed, removal of temporary watercourse crossings, reduce traffic by locating camps near construction sites. Posting of restricted access and speed signage will follow the Construction Specification for Temporary Traffic Control Devices (Ministry of Transportation, 2025). • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources. Temporary access roads and other temporary construction infrastructure will be reclaimed as quickly as possible following construction. As part of the reclamation of temporary access roads, access to these roads will be physically blocked to decrease public use.	• Residual changes to wolverine from increase in public access	• Context: Ecological • Direction: Negative • Magnitude: Moderate • Geographic Extent: Local • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Possible • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Furbearers (wolverine)**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Increase in public access—Could affect wolverine survival and reproduction through increased trapping efforts.	• Access roads used for permanent maintenance activities will be blocked while not in use. • Employees will be prohibited from hunting or carrying firearms while working on the Project maintenance. • Implement an Environmental Protection Plan that includes the following measures to control, and / or restrict public use of access roads during Operations: speed limits, gates / manned gates, signage, reduced road standard, felling of timber across temporary access roads after reclaimed, removal of temporary watercourse crossings, reduce traffic by locating camps near construction sites. Posting of restricted access and speed signage will follow the Construction Specification for Temporary Traffic Control Devices (Ministry of Transportation, 2025). • During Operations, the Community Access Road will be accessible to the public but access roads for aggregate areas and other infrastructure required for maintenance activities will be gated to limit public access. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources. • A proactive outreach and education program aimed at increasing awareness of the presence of wolverine within the area, the potential effects of incidental trapping on wolverine populations, and effective mitigation measures that reduce the likelihood of incidental wolverine trapping as outlined in Best Management Practices to Avoid Wolverine (Ontario Fur Managers Federation, 2018) will be developed and implemented.	• Residual changes to wolverine from increase in public access	• Context: Ecological • Direction: Negative • Magnitude: Moderate • Geographic Extent: Local • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Possible • Significant: Not Significant • Uncertainty: High • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				• During highway maintenance, Ministry of Transportation's Best Management Practices for Species at Risk Protection During Maintenance Activities (Ministry of Transportation, 2017a) will be considered and included in the development of the Environmental Protection Plan.		
• **Furbearers (American marten)**	• Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Pits and quarries • Temporary concrete batch plants • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls)	• Construction	• Habitat loss and alteration—Habitat loss is the direct removal or alteration of soil and vegetation that may change habitat availability, use, and connectivity and influence American marten abundance and distribution.	• Limit the Project footprint to the extent feasible. • Use existing access roads where possible. • Any American marten dens observed will be marked as sensitive sites and isolated. • Maintain buffer zones of 30 metres around waterbodies, and limit clearing of riparian vegetation to the extent practicable and to the requirement of the access road and alignment clearing width only. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources. • Temporary access roads and trails, construction camps, turnaround areas, waterbody crossings and temporary laydown areas will be reclaimed at the end of construction. • An Environmental Protection Plan and a Cleanup and Reclamation Plan will be developed and implemented. Where necessary, seedling planting will occur to improve reclamation success on areas of temporary disturbance (for example, temporary access roads, laydown areas, camps, and workspaces) where habitat enhancement is identified. Reclamation plans will be confirmed through engagement with Indigenous communities, the Ministry of Natural Resources and local foresters. Effectiveness of	• Residual changes to American marten from habitat loss and alteration	• Context: Ecological • Direction: Negative • Magnitude: Low • Geographic Extent: Construction Disturbance Area (direct habitat loss) / Local Study Area (habitat fragmentation) • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Certain • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				reclamation efforts will be monitored and managed post-construction, including confirmation that vegetation communities that naturally regenerate (or were planted) are similar to adjacent vegetation communities. If required, adaptive management will be employed to modify or enhance any reclamation efforts.		
• **Furbearers (American marten)**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Habitat loss and alteration—Habitat loss is the direct removal or alteration of soil and vegetation that may change habitat availability, use, and connectivity and influence American marten abundance and distribution.	• Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• No residual effect anticipated	• No residual effect anticipated
• **Furbearers (American marten)**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Pits and quarries • Drilling / blasting / aggregate production	• Construction	• Sensory disturbance—Sensory disturbance (for example, lights, smells, noise, human activity) can alter wildlife habitat availability, use, and connectivity (movement and behaviour), which can lead to changes in abundance and distribution and adversely affect survival and reproduction.	• Construction traffic will be restricted to designated areas. • During construction, access to the Community Access Road corridor will be restricted to construction personnel. • Noise-producing equipment will be fitted with noise-reducing components, where feasible, and these components will be maintained. • Unnecessary idling of vehicles and equipment will be limited on construction sites. • Wildlife awareness training will be provided for road construction workers to reduce vehicle speeds and associated noise and dust emission levels. • Industry best practices will be used for blasting activities, including scheduling when in the vicinity of sensitive wildlife sites. • Vegetation buffers will be retained around quarries to reduce noise, where feasible. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• Residual changes to American Marten from sensory disturbance	• Context: Ecological • Direction: Negative • Magnitude: Low • Geographic Extent: Local • Duration: Medium term • Frequency: Continuous • Reversibility: Reversible • Likelihood: Probable • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Furbearers (American marten)**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Sensory disturbance—Sensory disturbance (for example, lights, smells, noise, human activity) can alter wildlife habitat availability, use, and connectivity (movement and behaviour), which can lead to changes in abundance and distribution and adversely affect survival and reproduction.	• Speed limits will be posted and enforced to reduce vehicle speeds and associated noise. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• Residual changes to American Marten from sensory disturbance	• Context: Ecological • Direction: Negative • Magnitude: Low • Geographic Extent: Local • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Probable • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect
• **Furbearers (American marten)**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Pits and quarries • Temporary concrete batch plants • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Increase in predator access—Increased access for predators (for example, coyote, wolf and black bear) may increase competition for prey and may increase predation risk and decrease survival and reproduction for American marten.	• The Project footprint is designed to minimize vegetation clearing and access road requirements to the extent feasible (for example, concentrate temporary activities spatially, retain habitat outside of scoped Construction Disturbance Area, restrict construction vehicle traffic to established access roads where feasible). • Restrict wildlife access to waste (for example, collect domestic and industrial waste and store in temporary containers until transported offsite, empty chemical toilets regularly, prohibit littering, prohibit feeding and harassment of wildlife). • Design and construct temporary linear features to decrease predator efficiency (for example, retain vegetation under 2 metres, minimize width of linear features, switch backs and bends in temporary road construction), and reduce predator mobility (for example, not removing snow unless necessary). • During construction, the ongoing use of inactive areas by predators will be minimized through physical control measures such as rollback, removal of creek crossings, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access. • To minimize ongoing attraction of predators to the Project area, road kill will be cleaned up following best management practices outlined by	• Residual changes to American Marten from increase in predator access	• Context: Ecological. • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration: Long term • Frequency: Continuous • Reversibility: Reversible (for access roads that become revegetated) • Likelihood: Possible • Significant: Not Significant • Uncertainty: High • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				Ontario's Ministry of Transportation and wildlife access to waste will be restricted. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources. • Progressive reclamation and revegetation would be implemented as non-permanent features would be decommissioned and reclaimed or revegetated naturally.		
• **Furbearers (American marten)**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Increase in predator access—Increased access for predators (for example, coyote, wolf and black bear) may increase competition for prey and may increase predation risk and decrease survival and reproduction for American marten.	• Restrict wildlife access to waste (for example, collect domestic and industrial waste and store in temporary containers until transported offsite, empty chemical toilets regularly, prohibit littering, prohibit feeding and harassment of wildlife). • During Operations, the ongoing use of inactive areas by predators will be minimized through physical control measures such as rollback, removal of creek crossings, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access. • To minimize ongoing attraction of predators to the Project area, road kill will be cleaned up following best management practices outlined by Ontario's Ministry of Transportation and wildlife access to waste will be restricted. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• Residual changes to American Marten from increase in predator access	• Context: Ecological. • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration: Long term • Frequency: Continuous • Reversibility: Reversible (for access roads that become revegetated) / Irreversible (for the all-season Community Access Road and permanent access roads) • Likelihood: Possible • Significant: Not Significant • Uncertainty: High • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Furbearers (American marten)**	• Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Pits and quarries	• Construction	• Incidental take—Vegetation removal and soil alterations during site preparation for constructions activities, may result in destruction of dens, abandonment of dens and affect the survival and reproductive success of American marten.	• Construction traffic will be restricted to designated areas. • Minimize habitat loss and alteration to the extent possible. • Environmental training for workers will include information on American marten den identification and procedures to follow if a den is identified. • Herbicides or pesticides will not be used at any stage of the Community Access Road construction. • If an active den is identified during active construction, including during vegetation removal, work will stop and local Ministry of Natural Resources offices will be contacted immediately. The den will be clearly marked, a 100-metre buffer surrounding the den will be established and no vegetation removal will proceed within that buffer until Ministry of Natural Resources is engaged. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• Residual changes to American marten from incidental take	• Context: Ecological • Direction: Negative • Magnitude: Low magnitude changes to survival and reproduction during construction and operations. • Geographic Extent: Construction Disturbance Area • Duration: Medium-term • Frequency: Infrequent • Reversibility: Irreversible • Likelihood: Possible • Significant: Not Significant • Uncertainty: High • Direct / Indirect: Direct
• **Furbearers (American marten)**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Incidental take—Vegetation removal and soil alterations during site preparation for construction and operations activities, may result in destruction of dens, abandonment of dens and affect the survival and reproductive success of American marten.	• Maintenance traffic will be restricted to designated areas. • Minimize habitat loss and alteration to the extent possible. • Environmental training for workers will include information on American marten den identification and procedures to follow if a den is identified. • Herbicides or pesticides will not be used during the Community Access Road Operations phase. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• No residual effect anticipated	• No residual effect anticipated

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Furbearers (American marten)**	• Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Pits and quarries	• Construction	• Collisions with vehicles and equipment—Collisions with Project vehicles during construction and operations may cause injury or mortality to individual animals.	• Implement an Environmental Protection Plan that includes the following measures to minimize collisions between wildlife and vehicles during construction and operations: provide driver training to construction workers to understand the importance of reducing vehicle speeds, spread awareness of local wildlife, give wildlife the right-of-way, communicate the presence of wildlife along access roads and on site to other employees, and mandatory reporting of wildlife collisions. • Worker transportation to site will be coordinated to reduce traffic volumes. • Employees and owner / operators will be subject to restrictions while working including prohibition of personal snowmobiles, all-terrain vehicles and other motorized recreational vehicles; and speeding on roads. • A reporting protocol and system will be developed to report incidental wildlife observations and wildlife-vehicle collisions during construction. • Posting of appropriate speed limits, crossing and wildlife warning signage. • De-icing salts will not be used on the unpaved Community Access Road during construction or Operations. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• Residual change to American marten from collisions with vehicles	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration: Permanent • Frequency: Continuous until Construction is over • Reversibility: Irreversible • Likelihood: Possible • Significant: Not Significant • Uncertainty: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Furbearers (American marten)**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Collisions with vehicles and equipment—Collisions with Project vehicles during construction and operations may cause injury or mortality to individual animals.	• Speed limits will be posted and enforced to reduce vehicle speeds and associated collisions with wildlife. • Operations traffic will be restricted to approved right-of-way, workspace and access roads or trails. • Pits and quarries and other infrastructure required for maintenance activities will be gated to limit public access. • Implement an Environmental Protection Plan that includes the following measures to minimize collisions between wildlife and vehicles during Maintenance: provide driver training to Maintenance workers to understand the importance of reducing vehicle speeds, spread awareness of local wildlife, give wildlife the right-of-way, communicate the presence of wildlife along access roads and on site to other employees, and mandatory reporting of wildlife collisions. • Worker transportation to site will be coordinated to reduce traffic volumes. • Employees and owner / operators will be subject to restrictions while working including prohibition of personal snowmobiles, all-terrain vehicles and other motorized recreational vehicles; and speeding on roads. Confining vehicle traffic to approved right-of-way, workspace, and access roads. • A reporting protocol and system will be developed to report incidental wildlife observations and wildlife-vehicle collisions during Operations. • Blocking winter roads and temporary access routes and trails no longer required as Maintenance proceeds. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• Residual change to American marten from collisions with vehicles	• Context: • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Possible • Significant: Not Significant • Uncertainty: High • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Furbearers (American marten)**	• Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Increase in public access—Could affect American marten survival and reproduction through increased trapping efforts.	• Access roads used for permanent maintenance activities will be blocked while not in use. • Employees will be prohibited from hunting or carrying firearms while working on the Project maintenance. • Implement an Environmental Protection Plan that includes the following measures to control, and / or restrict public use of access roads during construction and operations: speed limits, gates / manned gates, signage, reduced road standard, felling of timber across temporary access roads after reclaimed, removal of temporary watercourse crossings, reduce traffic by locating camps near construction sites. Posting of restricted access and speed signage will follow the Construction Specification for Temporary Traffic Control Devices (Ministry of Transportation, 2025). • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources. Temporary access roads and other temporary construction infrastructure will be reclaimed as quickly as possible following construction. As part of the reclamation of temporary access roads, access to these roads will be physically blocked to decrease public use.	• Residual changes to American marten from increase in public access	• Context: Ecological. • Direction: Negative • Magnitude: Low • Geographic Extent: Local • Duration: Permanent • Frequency: Continuous until Construction is over • Reversibility: Irreversible • Likelihood: Possible • Significant: Not Significant • Uncertainty: High • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Furbearers (American marten)**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Increase in public access—Could affect American marten survival and reproduction through increased trapping efforts.	• Access roads used for permanent maintenance activities will be blocked while not in use. • Employees will be prohibited from hunting or carrying firearms while working on the Project maintenance. • Implement an Environmental Protection Plan that includes the following measures to control, and / or restrict public use of access roads during Operations: speed limits, gates / manned gates, signage, reduced road standard, felling of timber across temporary access roads after reclaimed, removal of temporary watercourse crossings, reduce traffic by locating camps near construction sites. Posting of restricted access and speed signage will follow the Construction Specification for Temporary Traffic Control Devices (Ministry of Transportation, 2025). • During Operations, the Community Access Road will be accessible to the public but access roads for aggregate areas and other infrastructure required for maintenance activities will be gated to limit public access. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• Residual changes to American marten from increase in public access	• Context: Ecological. • Direction: Negative • Magnitude: Low • Geographic Extent: Local • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Possible • Significant: Not Significant • Uncertainty: High • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Furbearers (beaver)**	• Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Pits and quarries • Temporary concrete batch plants • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls)	• Construction	• Habitat loss and alteration—Habitat loss is the direct removal or alteration of soil and vegetation that may change habitat availability, use, and connectivity and influence beaver abundance and distribution.	• Limit the Project footprint to the extent feasible. • Use existing access roads where possible. • Any beaver lodge observed will be marked as sensitive and protected. • Maintain buffer zones of 30 metres around waterbodies, and limit clearing of riparian vegetation to the extent practicable and to the requirement of the access road and alignment clearing width only. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources. • Temporary access roads and trails, construction camps, turnaround areas, waterbody crossings and temporary laydown areas will be reclaimed at the end of construction. • An Environmental Protection Plan and a Cleanup and Reclamation Plan will be developed and implemented. Where necessary, seedling planting will occur to improve reclamation success on areas of temporary disturbance (for example, temporary access roads, laydown areas, camps, and workspaces) where habitat enhancement is identified. Reclamation plans will be confirmed through engagement with Indigenous communities, the Ministry of Natural Resources and local foresters. Effectiveness of reclamation efforts will be monitored and managed post-construction, including confirmation that vegetation communities that naturally regenerate (or were planted) are similar to adjacent vegetation communities. If required, adaptive management will be employed to modify or enhance any reclamation efforts. • The loss and alteration of beaver habitat will be minimized to the extent possible and will be undertaken in compliance with the requirements of the *Fisheries Act* (1985).	• Residual changes to beaver from habitat loss and alteration	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area (direct habitat loss) / Local Study Area (habitat fragmentation) • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Certain • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Furbearers (beaver)**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Habitat loss and alteration—Habitat loss is the direct removal or alteration of soil and vegetation that may change habitat availability, use, and connectivity and influence beaver abundance and distribution.	• Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• Residual changes to beaver from habitat loss and alteration	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local Study Area (habitat fragmentation) • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Certain • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Direct
• **Furbearers (beaver)**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Pits and quarries • Drilling / blasting / aggregate production	• Construction	• Sensory disturbance—Sensory disturbance (for example, lights, smells, noise, human activity) can alter wildlife habitat availability, use, and connectivity (movement and behaviour), which can lead to changes in abundance and distribution and adversely affect survival and reproduction.	• Construction traffic will be restricted to designated areas. • During construction, access to the all-season road corridor will be restricted to construction personnel. • Noise-producing equipment will be fitted with noise-reducing components, where feasible, and these components will be maintained. • Unnecessary idling of vehicles and equipment will be limited on construction sites. • Wildlife awareness training will be provided for road construction workers to reduce vehicle speeds and associated noise and dust emission levels. • Industry best practices will be used for blasting activities, including scheduling when in the vicinity of sensitive wildlife sites. • Vegetation buffers will be retained around quarries to reduce noise, where feasible. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• Residual changes to beave from sensory disturbance	• Context: Ecological. • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration: Medium term • Frequency: Continuous • Reversibility: Reversible • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Furbearers (beaver)**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Sensory disturbance—Sensory disturbance (for example, lights, smells, noise, human activity) can alter wildlife habitat availability, use, and connectivity (movement and behaviour), which can lead to changes in abundance and distribution and adversely affect survival and reproduction.	• Speed limits will be posted and enforced to reduce vehicle speeds and associated noise. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• Residual changes to beave from sensory disturbance	• Context: Ecological. • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Possible • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect
• **Furbearers (beaver)**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Pits and quarries • Temporary concrete batch plants • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Increase in predator access—Increased access for predators (for example, coyote, wolf and black bear) may increase competition for prey and may increase predation risk and decrease survival and reproduction for beaver.	• The Project footprint is designed to minimize vegetation clearing and access road requirements to the extent feasible (for example, concentrate temporary activities spatially, retain habitat outside of scoped Construction Disturbance Area, restrict construction vehicle traffic to established access roads where feasible). • Restrict wildlife access to waste (for example, collect domestic and industrial waste and store in temporary containers until transported offsite, empty chemical toilets regularly, prohibit littering, prohibit feeding and harassment of wildlife). • Design and construct temporary linear features to decrease predator efficiency (for example, retain vegetation under 2 metres, minimize width of linear features, switch backs and bends in temporary road construction), and reduce predator mobility (for example, not removing snow unless necessary). • During construction, the ongoing use of inactive areas by predators will be minimized through physical control measures such as rollback, removal of creek crossings, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access. • To minimize ongoing attraction of predators to the Project area, roadkill will be cleaned up following best management practices outlined by Ontario's Ministry of Transportation and wildlife access to waste will be restricted.	• Residual changes to beaver from increases in predator access	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration: Long term (for access roads that become revegetated) / Permanent (for the all-season Community Access Road and permanent access roads) • Frequency: Continuous • Reversibility: Reversible (for access roads that become revegetated) / Irreversible (for the all-season Community Access Road and permanent access roads) • Likelihood: Possible • Significant: Not Significant • Uncertainty: High • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				• Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources. • Progressive reclamation and revegetation would be implemented as non-permanent features would be decommissioned and reclaimed or revegetated naturally.		
• **Furbearers (beaver)**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Increase in predator access—Increased access for predators (for example, coyote, wolf and black bear) may increase competition for prey and may increase predation risk and decrease survival and reproduction for beaver.	• Restrict wildlife access to waste (for example, collect domestic and industrial waste and store in temporary containers until transported offsite, empty chemical toilets regularly, prohibit littering, prohibit feeding and harassment of wildlife). • During Operations, the ongoing use of inactive areas by predators will be minimized through physical control measures such as rollback, removal of creek crossings, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access. • To minimize ongoing attraction of predators to the Project area, road kill will be cleaned up following best management practices outlined by Ontario's Ministry of Transportation and wildlife access to waste will be restricted. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• Residual changes to beaver from increases in predator access	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration: Permanent (for the all-season Community Access Road and permanent access roads) • Frequency: Continuous • Reversibility: Irreversible (for the all-season Community Access Road and permanent access roads) • Likelihood: Possible • Significant: Not Significant • Uncertainty: High • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Furbearers (beaver)**	• Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Pits and quarries	• Construction	• Incidental take—Vegetation removal and soil alterations during site preparation for construction and operations activities, may result in destruction of dens, abandonment of dens and affect the survival and reproductive success of beaver.	• Screening culverts and regularly checking water crossings for evidence of beaver activity and removing log jams early can reduce the need to remove beaver dams or lodges in ways that could cause incidental take of beavers. • Minimize habitat loss and alteration to the extent possible. • Environmental training for workers will include information on beaver lodge identification and procedures to follow if a lodge is identified. • Herbicides or pesticides will not be used at any stage of the Community Access Road construction. • If an active lodge is identified during active construction, including during vegetation removal, work will stop and local Ministry of Natural Resources offices will be contacted immediately. If a beaver lodge or dam requires removal then an application for an Authorization to Interfere with / Destroy a Black Bear or Furbearing Mammal Den, Beaver Dam, Black Bear in Den will be submitted to the Ministry of Natural Resources. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• Residual changes to beave from incidental take	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration: Medium-term • Frequency: Infrequent • Reversibility: Irreversible • Likelihood: Possible • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Direct
• **Furbearers (beaver)**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Incidental take—Vegetation removal and soil alterations during site preparation for construction and operations activities, may result in destruction of dens, abandonment of dens and affect the survival and reproductive success of beaver.	• Maintenance traffic will be restricted to designated areas. • Herbicides or pesticides will not be used during the Community Access Road Operations phase. • Environmental training for workers will include information on beaver lodge identification and procedures to follow if a lodge is identified. • Follow best management practices and environmental approval conditions,	• Residual changes to beave from incidental take	• Context: Ecological • Direction: Negative • Magnitude: Negligible. • Geographic Extent: Construction Disturbance Area • Duration: Permanent • Frequency: Infrequent • Reversibility: Irreversible • Likelihood: Possible • Significant: Not Significant • Uncertainty: Low

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.		• Direct / Indirect: Direct
• **Furbearers (beaver)**	• Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Pits and quarries	• Construction	• Collisions with vehicles and equipment—Collisions with Project vehicles during construction and operations may cause injury or mortality to individual animals.	• Implement an Environmental Protection Plan that includes the following measures to minimize collisions between wildlife and vehicles during construction and operations: provide driver training to construction workers to understand the importance of reducing vehicle speeds, spread awareness of local wildlife, give wildlife the right-of-way, communicate the presence of wildlife along access roads and on site to other employees, and mandatory reporting of wildlife collisions. • Worker transportation to site will be coordinated to reduce traffic volumes. • Employees and owner / operators will be subject to restrictions while working including prohibition of personal snowmobiles, all-terrain vehicles and other motorized recreational vehicles; and speeding on roads. • A reporting protocol and system will be developed to report incidental wildlife observations and wildlife-vehicle collisions during construction. • Posting of appropriate speed limits, crossing and wildlife warning signage. • De-icing salts will not be used on the unpaved Community Access Road during construction or Operations. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• Residual changes to beaver from collisions with vehicles and equipment	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration: Permanent • Frequency: Continuous until Construction is over • Reversibility: Irreversible • Likelihood: Possible • Significant: Not Significant • Uncertainty: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Furbearers (beaver)**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Collisions with vehicles and equipment—Collisions with Project vehicles during construction and operations may cause injury or mortality to individual animals.	• Speed limits will be posted and enforced to reduce vehicle speeds and associated collisions with wildlife. • Operations traffic will be restricted to approved right-of-way, workspace and access roads or trails. • Pits and quarries and other infrastructure required for maintenance activities will be gated to limit public access. • Implement an Environmental Protection Plan that includes the following measures to minimize collisions between wildlife and vehicles during Maintenance: provide driver training to Maintenance workers to understand the importance of reducing vehicle speeds, spread awareness of local wildlife, give wildlife the right-of-way, communicate the presence of wildlife along access roads and on site to other employees, and mandatory reporting of wildlife collisions. • Worker transportation to site will be coordinated to reduce traffic volumes. • Employees and owner / operators will be subject to restrictions while working including prohibition of personal snowmobiles, all-terrain vehicles and other motorized recreational vehicles; and speeding on roads. Confining vehicle traffic to approved right-of-way, workspace, and access roads. • A reporting protocol and system will be developed to report incidental wildlife observations and wildlife-vehicle collisions during Operations. • Blocking winter roads and temporary access routes and trails no longer required as Maintenance proceeds. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• Residual changes to beaver from collisions with vehicles and equipment	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Possible • Significant: Not Significant • Uncertainty: High • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Furbearers (beaver)**	• Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Increase in public access—Could affect beaver survival and reproduction through increased trapping efforts.	• Access roads used for permanent maintenance activities will be blocked while not in use. • Employees will be prohibited from hunting or carrying firearms while working on the Project maintenance. • Implement an Environmental Protection Plan that includes the following measures to control, and / or restrict public use of access roads during construction and operations: speed limits, gates / manned gates, signage, reduced road standard, felling of timber across temporary access roads after reclaimed, removal of temporary watercourse crossings, reduce traffic by locating camps near construction sites. Posting of restricted access and speed signage will follow the Construction Specification for Temporary Traffic Control Devices (Ministry of Transportation, 2025). • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources. Temporary access roads and other temporary construction infrastructure will be reclaimed as quickly as possible following construction. As part of the reclamation of temporary access roads, access to these roads will be physically blocked to decrease public use. • Temporary access roads and other temporary construction infrastructure will be reclaimed as quickly as possible following construction. As part of the reclamation of temporary access roads, access to these roads will be physically blocked to decrease public use.	• Residual changes to beaver from increase in public access.	• Context: Ecological • Direction: Negative • Magnitude: Low • Geographic Extent: Local • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Possible • Significant: Not Significant • Uncertainty: High • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Furbearers (beaver)**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Increase in public access—Could affect beaver survival and reproduction through increased trapping efforts.	• Access roads used for permanent maintenance activities will be blocked while not in use. • Employees will be prohibited from hunting or carrying firearms while working on the Project maintenance. • Implement an Environmental Protection Plan that includes the following measures to control, and / or restrict public use of access roads during Operations: speed limits, gates / manned gates, signage, reduced road standard, felling of timber across temporary access roads after reclaimed, removal of temporary watercourse crossings, reduce traffic by locating camps near construction sites. Posting of restricted access and speed signage will follow the Construction Specification for Temporary Traffic Control Devices (Ministry of Transportation, 2025). • During Operations, the Community Access Road will be accessible to the public but access roads for aggregate areas and other infrastructure required for maintenance activities will be gated to limit public access. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• Residual changes to beaver from increase in public access.	• Context: Ecological • Direction: Negative • Magnitude: Low • Geographic Extent: Local • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Possible • Significant: Not Significant • Uncertainty: High • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Reptiles and amphibians**	• Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Pits and quarries • Temporary concrete batch plants • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls)	• Construction	• Habitat loss and alteration—Habitat loss is the direct removal or alteration of soil and vegetation that may change habitat availability, use, and connectivity and influence reptile and amphibian abundance and distribution.	• Limit the Project footprint to the extent feasible. • Use existing access roads where possible. • Maintain buffer zones of 30 metres around waterbodies, and limit clearing of riparian vegetation to the extent practicable and to the requirement of the access road and alignment clearing width only. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources. • Temporary access roads and trails, construction camps, turnaround areas, waterbody crossings and temporary laydown areas will be reclaimed at the end of construction. • An Environmental Protection Plan and a Cleanup and Reclamation Plan will be developed and implemented. Where necessary, seedling planting will occur to improve reclamation success on areas of temporary disturbance (for example, temporary access roads, laydown areas, camps, and workspaces) where habitat enhancement is identified. Reclamation plans will be confirmed through engagement with Indigenous communities, the Ministry of Natural Resources and local foresters. Effectiveness of reclamation efforts will be monitored and managed post-construction, including confirmation that vegetation communities that naturally regenerate (or were planted) are similar to adjacent vegetation communities. If required, adaptive management will be employed to modify or enhance any reclamation efforts.	• Residual changes to reptiles an amphibians from habitat loss and alteration	• Context: Ecological • Direction: Negative • Magnitude: Low • Geographic Extent: Construction Disturbance Area (direct habitat loss) / Local Study Area (habitat fragmentation) • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Certain • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Reptiles and amphibians**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Habitat loss and alteration—Habitat loss is the direct removal or alteration of soil and vegetation that may change habitat availability, use, and connectivity and influence reptile and amphibian abundance and distribution.	• Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• No residual effect anticipated	• No residual effect anticipated
• **Reptiles and amphibians**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Pits and quarries • Drilling / blasting / aggregate production	• Construction	• Sensory disturbance—Sensory disturbance (for example, lights, smells, noise, human activity) can alter wildlife habitat availability, use, and connectivity (movement and behaviour), which can lead to changes in abundance and distribution and adversely affect survival and reproduction.	• Construction traffic will be restricted to designated areas. • During construction, access to the all-season road corridor will be restricted to construction personnel. • Noise-producing equipment will be fitted with noise-reducing components, where feasible, and these components will be maintained. • Unnecessary idling of vehicles and equipment will be limited on construction sites. • Wildlife awareness training will be provided for road construction workers to reduce vehicle speeds and associated noise and dust emission levels. • Industry best practices will be used for blasting activities, including scheduling when in the vicinity of sensitive wildlife sites. • Vegetation buffers will be retained around quarries to reduce noise, where feasible. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• Residual change to reptiles and amphibians from sensory disturbance	• Context: Ecological • Direction: Negative • Magnitude: Negligible magnitude • Geographic Extent: Local • Duration: Medium term • Frequency: Continuous • Reversibility: Reversible during construction • Likelihood: Probable • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Reptiles and amphibians**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Sensory disturbance—Sensory disturbance (for example, lights, smells, noise, human activity) can alter wildlife habitat availability, use, and connectivity (movement and behaviour), which can lead to changes in abundance and distribution and adversely affect survival and reproduction.	• Speed limits will be posted and enforced to reduce vehicle speeds and associated noise. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• Residual change to reptiles and amphibians from sensory disturbance	• Context: Ecological. • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Probable • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect
• **Reptiles and amphibians**	• Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Pits and quarries	• Construction	• Incidental take—Vegetation removal and soil alterations during site preparation for construction and operations activities, may result in destruction of habitats and affect the survival and reproductive success of reptiles and amphibians.	• Minimize habitat loss and alteration to the extent possible. • Herbicides or pesticides will not be used at any stage of the Community Access Road construction. The development of an Environmental Protection Plan which includes a worker awareness program. • Construction traffic will be restricted to designated areas. • Speed limits will be enforced on site during construction activities. • Construction personnel will traverse the path of construction equipment, to induce frogs, toads, and snakes to be scared away from the path of oncoming machinery. • Any reptiles or amphibians found within work areas will be relocated to suitable habitat nearby. Safe handling practices will be used to move turtles, snakes and other herpetofauna to areas away from the construction (for example, Ontario Species at Risk Handling Manual: For *Endangered Species Act* Authorization Holders). • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• Residual changes to reptile and amphibians from incidental take	• Context: Ecological • Direction: Negative • Magnitude: Low magnitude • Geographic Extent: Construction Disturbance Area • Duration: Medium term • Frequency: Infrequent • Reversibility: Irreversible • Likelihood: Probable • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Reptiles and amphibians**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Incidental take—Vegetation removal and soil alterations during site preparation for construction and operations activities, may result in destruction of habitats and affect the survival and reproductive success of reptiles and amphibians.	• Maintenance traffic will be restricted to designated areas • The development of an Environmental Protection Plan that includes a worker awareness program. • Herbicides or pesticides will not be used during the Community Access Road Operations phase. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• Residual changes to reptile and amphibians from incidental take	• Context: Ecological • Direction: Negative • Magnitude: Low magnitude • Geographic Extent: Construction Disturbance Area • Duration: Permanent • Frequency: Infrequent • Reversibility: Irreversible • Likelihood: Probable • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Direct
• **Reptiles and amphibians**	• Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Pits and quarries	• Construction	• Collisions with vehicles and equipment—Collisions with Project vehicles during construction and operations may cause injury or mortality to individual animals.	• Implement an Environmental Protection Plan that includes the following measures to minimize collisions between wildlife and vehicles during construction and operations: provide driver training to construction workers to understand the importance of reducing vehicle speeds, spread awareness of local wildlife, give wildlife the right-of-way, communicate the presence of wildlife along access roads and on site to other employees, and mandatory reporting of wildlife collisions. • Worker transportation to site will be coordinated to reduce traffic volumes. • Employees and owner / operators will be subject to restrictions while working including prohibition of personal snowmobiles, all-terrain vehicles and other motorized recreational vehicles; and speeding on roads. • A reporting protocol and system will be developed to report incidental wildlife observations and wildlife-vehicle collisions during construction. • Monitoring for reptiles and amphibians will be conducted during construction and reptiles and amphibians will be relocated as needed to similar habitat outside of the work area.	• Residual changes to gartersnake from collisions with vehicles and equipment	• Context: Ecological • Direction: Negative • Magnitude: Low magnitude • Geographic Extent: Construction Disturbance Area • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Probable • Significant: Not Significant • Uncertainty: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				• Signage will be posted in areas where reptiles and amphibians are regularly observed. • Sub-surface eco-passages and exclusion fencing will be established at culverts along the north-south segment of the Community Access Road. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.		
• **Reptiles and amphibians**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Collisions with vehicles and equipment—Collisions with Project vehicles during construction and operations may cause injury or mortality to individual animals.	• Speed limits will be posted and enforced to reduce vehicle speeds and associated collisions with wildlife. • Monitoring for reptiles and amphibians will be conducted during operations and reptiles and amphibians will be relocated as needed to similar habitat outside of the work area. • Signage will be posted in areas where reptiles and amphibians are regularly observed. • Operations traffic will be restricted to approved right-of-way, workspace and access roads or trails. • Implement an Environmental Protection Plan that includes the following measures to minimize collisions between wildlife and vehicles during Maintenance: provide driver training to Maintenance workers to understand the importance of reducing vehicle speeds, spread awareness of local wildlife, give wildlife the right-of-way, communicate the presence of wildlife along access roads and on site to other employees, and mandatory reporting of wildlife collisions. • Worker transportation to site will be coordinated to reduce traffic volumes. • Employees and owner / operators will be subject to restrictions while working including prohibition of personal	• Residual changes to gartersnake from collisions with vehicles and equipment	• Context: Ecological • Direction: Negative • Magnitude: Low magnitude • Geographic Extent: Construction Disturbance Area • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Certain • Significant: Not Significant • Uncertainty: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				snowmobiles, all-terrain vehicles and other motorized recreational vehicles; and speeding on roads. Confining vehicle traffic to approved right-of-way, workspace, and access roads. • A reporting protocol and system will be developed to report incidental wildlife observations and wildlife-vehicle collisions during Operations. • Sub-surface eco-passages and exclusion fencing will be established at culverts along the north-south segment of the Community Access Road. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.		
• **Pollinating Insects**	• Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Pits and quarries • Temporary concrete batch plants • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls)	• Construction	• Habitat loss and alteration—The direct removal or alteration of soil and vegetation that may change habitat availability, use, and connectivity and influence pollinating insect abundance and distribution.	• Limit the Project footprint to the extent feasible. • Use existing access roads where possible. • Maintain buffer zones of 30 metres around waterbodies, and limit clearing of riparian vegetation to the extent practicable and to the requirement of the access road and alignment clearing width only. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources. • Temporary access roads and trails, construction camps, turnaround areas, waterbody crossings and temporary laydown areas will be reclaimed at the end of construction.	• Residual changes to pollinating insects from habitat loss and alteration	• Context: Ecological • Direction: Negative • Magnitude: Negligible magnitude • Geographic Extent: Construction Disturbance Area (direct habitat loss) / Local Study Area (habitat fragmentation) • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Certain • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				• An Environmental Protection Plan and a Cleanup and Reclamation Plan will be developed and implemented. Where necessary, seedling planting will occur to improve reclamation success on areas of temporary disturbance (for example, temporary access roads, laydown areas, camps, and workspaces) where habitat enhancement is identified. Reclamation plans will be confirmed through engagement with Indigenous communities, the Ministry of Natural Resources and local foresters. Effectiveness of reclamation efforts will be monitored and managed post-construction, including confirmation that vegetation communities that naturally regenerate (or were planted) are similar to adjacent vegetation communities. If required, adaptive management will be employed to modify or enhance any reclamation efforts.		
• **Pollinating Insects**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Habitat loss and alteration—The direct removal or alteration of soil and vegetation that may change habitat availability, use, and connectivity and influence pollinating insect abundance and distribution.	• Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• No residual effects anticipated	• No residual effects anticipated
• **Pollinating Insects**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Pits and quarries • Drilling / blasting / aggregate production	• Construction	• Sensory disturbance—(for example, lights, smells, noise, human activity) can alter wildlife habitat availability, use, and connectivity (movement and behaviour), which can lead to changes in abundance and distribution and adversely affect survival and reproduction.	• Construction traffic will be restricted to designated areas. • During construction, access to the Community Access Road corridor will be restricted to construction personnel. • Noise-producing equipment will be fitted with noise-reducing components, where feasible, and these components will be maintained. • Unnecessary idling of vehicles and equipment will be limited on construction sites. • Wildlife awareness training will be provided for road construction workers to reduce vehicle speeds and associated noise and dust emission levels.	• No residual effects anticipated	• No residual effects anticipated

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				• Industry best practices will be used for blasting activities, including scheduling when in the vicinity of sensitive wildlife sites. • Vegetation buffers will be retained around quarries to reduce noise, where feasible. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.		
• **Pollinating Insects**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Sensory disturbance—(for example, lights, smells, noise, human activity) can alter wildlife habitat availability, use, and connectivity (movement and behaviour), which can lead to changes in abundance and distribution and adversely affect survival and reproduction.	• Speed limits will be posted and enforced to reduce vehicle speeds and associated noise. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• No residual effects anticipated	• No residual effects anticipated
• **Pollinating Insects**	• Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Pits and quarries	• Construction	• Incidental take—Vegetation removal and soil alterations during site preparation for construction and operations activities, may result in destruction of habitats and affect the survival and reproductive success of pollinating insects.	• Minimize habitat loss and alteration to the extent possible. • The development of an Environmental Protection Plan which includes a worker awareness program. • Construction traffic will be restricted to designated areas. • Speed limits will be enforced on site during construction activities. • Herbicides or pesticides will not be used at any stage of the Community Access Road construction. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• Residual changes to pollinating insects from incidental take	• Context: Ecological. • Direction: Negative • Magnitude: Negligible magnitude • Geographic Extent: Construction Disturbance Area • Duration: Medium term • Frequency: Infrequent • Reversibility: Irreversible • Likelihood: Probable • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Pollinating Insects**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Incidental take—Vegetation removal and soil alterations during site preparation for construction and operations activities, may result in destruction of habitats and affect the survival and reproductive success of pollinating insects.	• Maintenance traffic will be restricted to designated areas • The development of an Environmental Protection Plan which includes a worker awareness program. • Herbicides or pesticides will not be used during the Community Access Road Operations phase. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• Residual changes to pollinating insects from incidental take	• Context: Ecological • Direction: Negative • Magnitude: Negligible magnitude • Geographic Extent: Construction Disturbance Area • Duration: Permanent • Frequency: Infrequent • Reversibility: Irreversible • Likelihood: Probable • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Direct
• **Pollinating Insects**	• Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Pits and quarries	• Construction	• Collisions with vehicles and equipment—Collisions with Project vehicles during construction and operations may cause injury or mortality to individual animals.	• Implement an Environmental Protection Plan that includes the following measures to minimize collisions between wildlife and vehicles during construction and operations: provide driver training to construction workers to understand the importance of reducing vehicle speeds, spread awareness of local wildlife, give wildlife the right-of-way, communicate the presence of wildlife along access roads and on site to other employees, and mandatory reporting of wildlife collisions. • Worker transportation to site will be coordinated to reduce traffic volumes. • Employees and owner / operators will be subject to restrictions while working including prohibition of personal snowmobiles, all-terrain vehicles and other motorized recreational vehicles; and speeding on roads. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources.	• Residual changes to pollinating insects from collisions with vehicles and equipment	• Context: Ecological • Direction: Negative • Magnitude: Negligible magnitude • Geographic Extent: Construction Disturbance Area • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Probable • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Pollinating Insects**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Collisions with vehicles and equipment—Collisions with Project vehicles during construction and operations may cause injury or mortality to individual animals.	• Speed limits will be posted and enforced to reduce vehicle speeds and associated collisions with wildlife. • Operations traffic will be restricted to approved right-of-way, workspace and access roads or trails. • Implement an Environmental Protection Plan that includes the following measures to minimize collisions between wildlife and vehicles during Maintenance: provide driver training to Maintenance workers to understand the importance of reducing vehicle speeds, spread awareness of local wildlife, give wildlife the right-of-way, communicate the presence of wildlife along access roads and on site to other employees, and mandatory reporting of wildlife collisions. • Worker transportation to site will be coordinated to reduce traffic volumes. • Employees and owner / operators will be subject to restrictions while working including prohibition of personal snowmobiles, all-terrain vehicles and other motorized recreational vehicles; and speeding on roads. Confining vehicle traffic to approved right-of-way, workspace, and access roads. • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, and Ontario Ministry of Natural Resources	• Residual changes to pollinating insects from collisions with vehicles and equipment	• Context: Ecological • Direction: Negative • Magnitude: Negligible magnitude • Geographic Extent: Construction Disturbance Area • Duration: Permanent • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Probable • Significant: Not Significant • Uncertainty: Low • Direct / Indirect: Direct

9.4.4 Birds

9.4.4.1 Project-Environment Interactions

As a component of the effects assessment, the Project activities were reviewed to find potential environmental interactions. These interactions were then assessed for potential effect (**Table 9.4-10**).

Table 9.4-10: Project-Environment Interactions - Birds

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• **Construction**	• Mobilization of equipment and supplies; • Temporary construction staging areas; • Temporary access roads and trails; • Temporary construction camps; • Right-of-way clearing and grubbing; • Pits and quarries; • Temporary concrete batch plants; • Drilling / blasting / aggregate production; • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching); • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls); • Construction site restoration; • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*; and • Decommissioning of temporary camps, roads / trails and staging areas.	• All bird valued components	• Habitat Availability • Habitat Distribution	• Introduction and spread of invasive plant species—can affect plant community composition, which in turn can affect bird habitat availability and distribution.
• **Operations**	• Operate the Community Access Road; and • Maintain the Community Access Road.	• All bird valued components	• Habitat Availability • Habitat Distribution	• Introduction and spread of invasive plant species—can affect plant community composition, which in turn can affect bird habitat availability and distribution.
• **Construction**	• Mobilization of equipment and supplies; • Temporary construction staging areas; • Temporary access roads and trails; • Temporary construction camps; • Right-of-way clearing and grubbing; • Pits and quarries; • Temporary concrete batch plants; • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching); • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls); • Construction site restoration; • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*; and • Decommissioning of temporary camps, roads / trails and staging areas.	• All bird valued components	• Habitat Availability • Habitat Distribution	• Emissions of criteria air contaminants—deposition of particulates in criteria air contaminant emissions (for example potential acid inputs) may change soil and vegetation quality and affect bird habitat availability and distribution.
• **Operations**	• Operate the Community Access Road; • Maintain the Community Access Road.	• All bird valued components	• Habitat Availability • Habitat Distribution	• Emissions of criteria air contaminants—deposition of particulates in criteria air contaminant emissions (for example potential acid inputs) may change soil and vegetation quality and affect bird habitat availability and distribution.

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• **Construction**	• Mobilization of equipment and supplies; • Temporary construction staging areas; • Temporary access roads and trails; • Temporary construction camps; • Right-of-way clearing and grubbing; • Pits and quarries; • Temporary concrete batch plants; • Drilling / blasting / aggregate production; • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching); • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls); • Construction site restoration; • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*; and • Decommissioning of temporary camps, roads / trails and staging areas.	• All bird valued components	• Habitat Availability • Habitat Distribution	• Fugitive dust emissions—deposition of dust particulates may change soil and vegetation quality and affect bird habitat availability and distribution.
• **Operations**	• Operate the Community Access Road; • Maintain the Community Access Road.	• All bird valued components	• Habitat Availability • Habitat Distribution	• Fugitive dust emissions—deposition of dust particulates may change soil and vegetation quality and affect bird habitat availability and distribution.
• **Construction**	• Mobilization of equipment and supplies; • Temporary construction staging areas; • Temporary access roads and trails; • Temporary construction camps; • Right-of-way clearing and grubbing; • Pits and quarries; • Temporary concrete batch plants; • Drilling / blasting / aggregate production; • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching); • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls); • Construction site restoration; • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*; and • Decommissioning of temporary camps, roads / trails and staging areas.	• All bird valued components	• Habitat Availability • Habitat Distribution	• Erosion and sedimentation—can alter surface water, groundwater, soil, and vegetation quality and affect bird habitat availability and distribution.
• **Operations**	• Operate the Community Access Road • Maintain the Community Access Road	• All bird valued components	• Habitat Availability • Habitat Distribution	• Erosion and sedimentation—can alter surface water, groundwater, soil, and vegetation quality and affect bird habitat availability and distribution.
• **Construction**	• Mobilization of equipment and supplies; • Temporary construction staging areas; • Temporary access roads and trails; • Temporary construction camps; • Right-of-way clearing and grubbing; • Pits and quarries; • Temporary concrete batch plants; • Drilling / blasting / aggregate production;	• All bird valued components	• Habitat Availability • Habitat Distribution	• Changes to surface water quantity—alteration of surface water drainage patterns, flows, and levels that can cause changes to soils and vegetation, which can affect bird habitat availability and distribution.

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
	• Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching); • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls); • Construction site restoration; • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*; and • Decommissioning of temporary camps, roads / trails and staging areas.			
• **Operations**	• Operate the Community Access Road; and • Maintain the Community Access Road.	• All bird valued components	• Habitat Availability • Habitat Distribution	• Surface water quantity—alteration of surface water drainage patterns, flows, and levels that can cause changes to soils and vegetation, which can affect bird habitat availability and distribution.
• **Construction**	• Mobilization of equipment and supplies; • Temporary construction staging areas; • Temporary access roads and trails; • Temporary construction camps; • Right-of-way clearing and grubbing; • Pits and quarries; • Temporary concrete batch plants; • Drilling / blasting / aggregate production; • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching); • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls); • Construction site restoration; • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*; and • Decommissioning of temporary camps, roads / trails and staging areas.	• All bird valued components	• Habitat Availability • Habitat Distribution	• Surface water quality—changes in surface water quality from Project activities could adversely affect bird habitat availability and distribution.
• **Operations**	• Operate the Community Access Road; and • Maintain the Community Access Road.	• All bird valued components	• Habitat Availability • Habitat Distribution	• Surface water quality—changes in surface water quality from Project activities could adversely affect bird habitat availability and distribution.
• **Construction**	• Mobilization of equipment and supplies. • Temporary construction staging areas. • Temporary access roads and trails. • Temporary construction camps. • Right-of-way clearing and grubbing. • Pits and quarries. • Temporary concrete batch plants. • Drilling / blasting / aggregate production. • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching). • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls). • Construction site restoration. • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*; and • Decommissioning of temporary camps, roads / trails and staging areas.	• All bird valued components	• Habitat Availability • Habitat Distribution	• Changes to groundwater —alteration of groundwater drainage and infiltration patterns, flows, and levels that can cause changes to soils and vegetation, which can affect bird habitat availability and distribution.

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• **Operations**	• Pits and quarries; • Operate the Community Access Road; and • Maintain the Community Access Road.	• All bird valued components	• Habitat Availability • Habitat Distribution	• Changes to groundwater—alteration of groundwater drainage and infiltration patterns, flows, and levels that can cause changes to soils and vegetation, which can affect bird habitat availability and distribution.
• **Construction**	• Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Pits and quarries • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls); • Construction site restoration; • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*; and • Decommissioning of temporary camps, roads / trails and staging areas.	• All bird valued components	• Survival and Reproduction	• Incidental take—Vegetation removal and soil alterations during site preparation for construction and operations activities, and infrastructure (for example, camp buildings) removal during decommissioning may result in destruction of nests, eggs, and individuals of birds.
• **Operations**	• Maintain the Community Access Road	• All bird valued components	• Survival and Reproduction	• Incidental take—Vegetation removal and soil alterations during site preparation for construction and operations activities, and infrastructure (for example, camp buildings) removal during decommissioning may result in destruction of nests, eggs, and individuals of birds.
• **Construction**	• Mobilization of equipment and supplies; • Temporary construction staging areas; • Temporary access roads and trails; • Temporary construction camps; • Right-of-way clearing and grubbing; • Pits and quarries; • Temporary concrete batch plants; • Drilling / blasting / aggregate production; • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching); • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls); • Construction site restoration; • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the Aggregate Resources Ac; and. • Decommissioning of temporary camps, roads / trails and staging areas.	• All bird valued components	• Survival and Reproduction	• Collision with vehicles and equipment—Collisions of birds with vehicles or heavy equipment may cause injury or mortality to individual birds.
• **Operations**	• Operate the Community Access Road; and • Maintain the Community Access Road.	• All bird valued components	• Survival and Reproduction	• Collision with vehicles and equipment—Collisions of birds with vehicles or heavy equipment may cause injury or mortality to individual birds.

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• **Construction**	• Mobilization of equipment and supplies; • Temporary construction staging areas; • Temporary access roads and trails; • Temporary construction camps; • Right-of-way clearing and grubbing; • Pits and quarries; • Temporary concrete batch plants; • Drilling / blasting / aggregate production; • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching); • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls); • Construction site restoration; • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*; and • Decommissioning of temporary camps, roads / trails and staging areas.	• All bird valued components	• Survival and Reproduction	• Wildlife attractants—Attraction of wildlife to the Community Access Road can affect bird survival and reproduction through increased mortality risk and changes to predator-prey relationships.
• **Operations**	• Operate the Community Access Road; and • Maintain the Community Access Road	• All bird valued components	• Survival and Reproduction	• Wildlife attractants—Attraction of wildlife to the Community Access Road can affect bird survival and reproduction through increased mortality risk and changes to predator-prey relationships.
• **Construction**	• Pits and quarries; • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching); and • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls).	• All bird valued components	• Survival and Reproduction	• Blasting and fly rock—May result in injury or mortality to birds.
• **Operations**	• Maintain the Community Access Road	• All bird valued components	• Survival and Reproduction	• Blasting and fly rock—May result in injury or mortality to birds.
• **Construction**	• Mobilization of equipment and supplies; • Temporary construction staging areas; • Temporary access roads and trails; • Temporary construction camps; • Right-of-way clearing and grubbing; • Pits and quarries; • Temporary concrete batch plants; • Drilling / blasting / aggregate production; • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching); • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls); • Construction site restoration; • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*; and • Decommissioning of temporary camps, roads / trails and staging areas.	• All bird valued components	• Survival and Reproduction	• Chemical or hazardous material stored on the Project site, or spills (for example, petroleum products, ammonium nitrate) can affect bird habitat availability and distribution.
• **Operations**	• Operate the Community Access Road; and • Maintain the Community Access Road.	• All bird valued components	• Survival and Reproduction	• Chemical or hazardous material stored on the Project site, or spills (for example, petroleum products, ammonium nitrate) can affect bird habitat availability and distribution.

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• **Construction**	• Temporary construction staging areas; • Temporary access roads and trails; • Temporary construction camps; • Right-of-way clearing and grubbing; • Pits and quarries; • Temporary concrete batch plants; • Drilling / blasting / aggregate production; • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching); • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls); and • Construction site restoration.	• All bird valued components	• Habitat Availability • Habitat Distribution • Survival and Reproduction	• Habitat loss—The direct removal or alteration of soil and vegetation that may change habitat availability, use, and connectivity and influence bird habitat availability, distribution, and survival and reproduction.
• **Operations**	• Operate the Community Access Road; and • Maintain the Community Access Road.	• All bird valued components	• Habitat Availability • Habitat Distribution • Survival and Reproduction	• Habitat loss—The direct removal or alteration of soil and vegetation that may change habitat availability, use, and connectivity and influence bird habitat availability, distribution, and survival and reproduction.
• **Construction**	• Mobilization of equipment and supplies; • Temporary construction staging areas; • Temporary access roads and trails; • Temporary construction camps; • Right-of-way clearing and grubbing; • Pits and quarries; • Temporary concrete batch plants; • Drilling / blasting / aggregate production; • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching); • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls); • Construction site restoration; • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*; and • Decommissioning of temporary camps, roads / trails and staging areas.	• All bird valued components	• Habitat Availability • Habitat Distribution • Survival and Reproduction	• Sensory disturbance (for example, lights, smells, noise, human activity) can alter bird habitat availability, use and connectivity (movement and behaviour), and survival and reproduction.
• **Operations**	• Operate the Community Access Road; and • Maintain the Community Access Road.	• All bird valued components	• Habitat Availability • Habitat Distribution • Survival and Reproduction	• Sensory disturbance (for example, lights, smells, noise, human activity) can alter bird habitat availability, use and connectivity (movement and behaviour), and survival and reproduction.
• **Operations**	• Operate the Community Access Road; and • Maintain the Community Access Road.	• All bird valued components	• Survival and Reproduction	• Increase in edge habitat—Can change predator-prey dynamics and influence bird survival and reproduction.
• **Construction**	• Birds Technical Support Document (Appendix L) included information on effects from the proposed Project on individual bird species.	• -	• -	• -
• **Operations**	• Birds Technical Support Document (Appendix L) included information on effects from the proposed Project on individual bird species.	• -	• -	• -

9.4.4.2 Discipline-Specific Characteristics

In support of the residual effects characteristics described in **Section 6.7.3**, **Table 6-1**, the following birds definitions apply to the effects assessment.

Ecological and Social Context

Ecological context for the bird valued components, context included species sensitivity, resilience, and adaptive capacity, current status and trends, and legislation and best management practices, incorporating Indigenous Knowledge where available. Consideration of ecological context includes timing, such as when the effect could occur during a critical life cycle of the valued component. Context also informs whether the residual effect would alter the ability of the valued component bird populations to be self-sustaining and ecologically effective (in other words, the determination of significance). Ecological context is discussed in a reasoned narrative with other characteristics such as magnitude, geographic extent, duration, reversibility, and probability of occurrence used to characterize residual effects and determine significance.

Magnitude

Integrating ecological context to understand the point at which a given magnitude is large enough to be critical for a valued component is directly linked to the self-sustaining and ecologically effective status of the population, and therefore directly linked to significance. For magnitude, environmental discipline-specific definitions are required and are provided in **Table 9.4-11** Magnitude of effects are project-related and exclude variations due to climate change.

Table 9.4-11: Bird Magnitude Definition

Magnitude Level	Definition	Rationale
• **Negligible**	• Limited to no variation predicted in the measurement indicators for bird valued components	• Changes to ecosystems or populations are minor and largely indiscernible; therefore, no effect on population resilience.
• **Low**	• A small variation predicted in the measurement indicators for bird valued components	• Minor incremental effects on ecosystems or populations are anticipated to be discernible but remain within the limits of ecosystem or population resilience.
• **Medium**	• A moderate variation predicted in the measurement indicators for bird valued components	• Incremental effects on ecosystems or populations are anticipated to be measurable but is inferred to remain within the limits of population resilience.
• **High**	• A large variation predicted in the measurement indicators for bird valued components	• Effects on ecosystems or populations are anticipated to be severe and likely to impair population resilience.

9.4.4.3 Residual Effects - Construction Phase

9.4.4.3.1 Changes to Birds Through the Introduction of Invasive Plant Species

9.4.4.3.1.1 Potential Effects

Habitat Availability and Distribution

Invasive plant species often establish in fragmented landscapes along edge habitats, such as cleared areas adjacent to roads (Lafortezza et al., 2010). Most non-native invasive plant species are introduced through various forms of human transport (Mack et al., 2000; Reichard and White, 2001). The regular movement of vehicles, equipment, and personnel associated with the Community Access Road could transport invasive plant seeds or plant parts into new areas in the effects assessment Construction Disturbance Area. Additionally, land clearing in the effects assessment Construction Disturbance Area will remove vegetation and disturb soils, increasing the potential for invasive plant species to establish and spread along the right-of-way and other areas of edge habitats in the effects assessment Construction Disturbance Area.

Invasive plant species thrive in areas with recently disturbed soils and a high ratio of edge habitat as this improves their ability to establish and spread (Honnay et al., 2002). As discussed in the Vegetation Technical Support Document (**Appendix J**) and Peatlands Technical Support Document (**Appendix I**) the introduction of invasive plant species into new areas can alter vegetation species diversity and the community plant structure through competition with native species, and by changing soil conditions (for example, nutrients, moisture) (Mack et al., 2000; Carlson and Shepherd, 2007; Truscott et al., 2008). These changes could have negative effects on bird habitat availability and distribution.

9.4.4.3.1.2 Mitigation and Enhancement Measures

A Project-specific environmental monitoring program will be developed and will contain mitigation measures to control invasive plant species. Herbicides or pesticides will not be used at any stage of the Community Access Road construction. A comprehensive list of mitigation measures to control invasive plant species during construction of the Community Access Road is provided in the Vegetation Technical Support Document (**Appendix J**) and Peatlands Technical Support Document (**Appendix I**). Mitigation measures to limit the introduction and spread of invasive plants are well understood and the methods have been demonstrated to be effective. The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.4.3.1.3 Predicted Residual Effects

Invasive plant species may occasionally be introduced within the effects assessment Construction Disturbance Area during the construction and operations phase. Best management practices and mitigation measures for controlling the spread of invasive species that will be implemented during construction are well understood, and the methods have been demonstrated to be effective. However, introduction of invasive plant species could still occur during construction, even following mitigation. Additionally, introduction of invasive plant species may be higher during operations due to public use of the Community Access Road. As such, the Community Access Road is expected to have net residual effects on birds and their habitats, relative to existing conditions and this interaction was carried forward into the residual effects characterization.

After implementation of mitigation, effects from the introduction of invasive plants are predicted to be possible to occur, reversible in the short term (construction) to long term (operations phase), infrequent, and confined to the effects assessment Construction Disturbance Area. Effects from the introduction of invasive plants on the ability of the bird populations in the effects assessment Regional Study Area to remain self-sustaining and ecologically effective are anticipated to be negative but negligible in magnitude.

9.4.4.3.2 Changes to Birds from Emissions of Criteria Air Contaminants

9.4.4.3.2.1 Potential Effects

Habitat Availability and Distribution

Construction of the Community Access Road are expected to generate air particulate emissions, including carbon monoxide, sulphur oxides (including sulphur dioxide), nitrogen oxides, and particulate matter. Construction activities are expected to produce air emissions from the use of construction vehicles, motorized equipment and machinery, power generators (to be used at temporary construction camps and temporary aggregate areas), the use of explosives (blasting), and the burning of non-hazardous waste materials (for example, food garbage at temporary construction camps).

The deposition of criteria air contaminant emissions can result in changes to soil and surface water quality, which has the potential to alter plant community structure, composition, and diversity by modifying the pH, nutrient content, and abundance and diversity of living organisms. Contamination of water, soil, and vegetation quality from deposition of Community Access Road air emissions has the potential to negatively

affect birds if it reduces the quality of suitable forage and habitat, which could ultimately affect the distribution of bird populations. This was also a concern that was also noted by Indigenous communities including Mushkegowuk Council, Kingfisher Lake First Nation, and Animbiigoo Zaagi'igan Anishinaabek (NextBridge Infrastructure, 2018; SNC Lavallin, 2020; Stantec, 2017b). The concern was noted through shared Indigenous Knowledge particularly relating to effects on birds as a result exposure / ingestion of contaminants due to emissions.

Air quality modelling was used to predict maximum ground-level concentrations of criteria air contaminant emissions during the construction and operations phases. The methods and results for air quality modelling are presented in detail in the Atmospheric Environment Technical Support Document (**Appendix S**). During construction, most air criteria contaminants were predicted to be below Canadian Ambient Air Quality Standards and / or Ontario Ambient Air Quality Criteria thresholds. However, threshold exceedances were noted for nitrogen dioxide and sulphur dioxide, carbon monoxide, acrolein, and benzo(a)pyrene emissions. Most threshold exceedances were limited to less than 760 metres from the emission source. The exceptions are nitrogen dioxide, sulphur dioxide, carbon monoxide emissions during quarry blasting. During quarry blasting, nitrogen dioxide and sulphur dioxide emissions thresholds may be exceeded by up to 12.3 kilometres, while carbon monoxide emissions may exceed the Ontario Ambient Air Quality Criteria threshold out to 1.5 kilometres.

It should be noted that the Air Quality modelling incorporated conservative assumptions (in other words, using worst-case scenarios) to make sure that effects were not underestimated.

9.4.4.3.2.2 Mitigation and Enhancement Measures

Potential mitigation measures outlined in the Ontario Ministry of Transportation Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions for Provincial Transportation Projects (Ontario Ministry of Transportation, 2020) may be implemented, if feasible. A Project-specific environmental monitoring program will be developed and will contain mitigation measures to control dust and air emissions during construction. Mitigation measures to limit emissions of criteria air contaminants are well understood and the methods have been demonstrated to be effective. A comprehensive list of mitigation measures that will be implemented to limit air particulate emissions during construction is provided in the Atmospheric Environment Technical Support Document (**Appendix S**).

9.4.4.3.2.3 Predicted Residual Effects

As discussed in the Vegetation Technical Support Document (**Appendix J**) and the Peatlands Technical Support Document (**Appendix I**), emissions of criteria air contaminants are anticipated to have negligible, possible effects on vegetation ecosystems, and, ultimately, bird habitat. As such, this interaction was determined to have no residual effects on bird habitat availability and distribution and is not carried forward in the assessment.

9.4.4.3.3 Changes to Birds from Fugitive Dust Emissions

9.4.4.3.3.1 Potential Effects

Habitat Availability and Distribution

Fugitive dust emissions were a concern that was highlighted by Indigenous communities including Marten Falls First Nation, Weenusk First Nation, and Aroland First Nation (Marten Falls First Nation, 2023, MNP LPP, 2024b; Shared Value Solutions, 2024). Fugitive dust emissions are expected to be produced during construction activities such as land clearing, blasting, and infrastructure implementation (Atmospheric Environment Technical Support Document; **Appendix S**). Accumulation of airborne dust produced from the Community Access Road may result in direct, localized changes to vegetation. For example, deposition of airborne dust onto vegetation can smother plant tissues, hinder gas exchange, and reduce photosynthesis by physically blocking sunlight (Farmer 1993). Consequently, the deposition of dust can and alter plant species composition, structure, and biomass. As a result, dust generated by Project Construction activities could adversely affect birds by degrading habitat quality and forage availability and distribution.

Air quality modelling was used to predict maximum ground-level concentrations of criteria air contaminant emissions during construction (Atmospheric Environment Technical Support Document; **Appendix S**). Threshold exceedances for the Community Access Road during construction are predicted for total suspended particulate, particulate matter less than 2.5 micrometres and particulate matter less than 10 micrometres emissions. Threshold exceedances for dust emissions are predicted to be reached at less than 300 metres from the emission source.

It should be noted that the Air Quality modelling incorporated conservative assumptions (in other words, using worst-case scenarios) to make sure that effects were not underestimated.

9.4.4.3.3.2 Mitigation and Enhancement Measures

Potential mitigation measures outlined in the Ontario Ministry of Transportation Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions for Provincial Transportation Projects (Ontario Ministry of Transportation, 2020) may be implemented, if feasible. A Project-specific environmental monitoring program will be developed and will contain mitigation measures to control dust and air emissions during construction. A comprehensive list of mitigation measures that will be implemented to limit dust deposition during construction is provided in the Atmospheric Environment Technical Support Document (**Appendix S**). Mitigation measures to limit dust deposition are well understood and the methods have been demonstrated to be effective. The effectiveness of mitigation measures will be evaluated during construction and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.4.3.3.3 Predicted Residual Effects

Effects on bird habitat availability and distribution from dust emissions are predicted to be larger during operations than during construction due to continuous use of the road by several hundred vehicles per day. Additionally, mitigation measures to limit dust emissions are predicted to be more effective during construction than during operations as construction traffic and equipment will be managed by owner / operators and more easily controlled, while, during operations, the Community Access Road will be used by public vehicles. Dust deposition, particularly during operations, is predicted to result in negligible but certain changes to vegetation quality in the effects assessment Local Study Area (Vegetation Technical Support Document [**Appendix J**]; Peatlands Technical Support Document [**Appendix I**]). As such, there is predicted to be a net residual effect on bird habitat availability and distribution from construction through operations. The residual effects from dust emissions were carried forward into the residual effects assessment characterization.

Effects from dust emissions are predicted to be **certain**, **reversible** in the **medium term** (construction) or **irreversible** (**long term**) (Operations), **continuous**, and confined to the **effects assessment Local Study Area**. Effects from dust emissions on the ability of the bird populations in the effects assessment Regional Study Area to remain self-sustaining and ecologically effective are anticipated to be **negative** but **negligible in magnitude**.

9.4.4.3.4 Changes to Birds from Erosion and Sedimentation

9.4.4.3.4.1 Potential Effects

Habitat Availability and Distribution

Construction activities such as watercourse crossings, vegetation clearing, earth moving, pit and quarry development and other Construction activities can result in exposure of vulnerable banks or slopes resulting in increased release of sediment. Sediment release into adjacent retained natural areas can have an effect on the composition and function of peatland and vegetation communities [Vegetation Technical Support Document (**Appendix J)**; Peatlands Technical Support Document (**Appendix I**)]. These changes can reduce or degrade bird habitat through localized changes in ecosystem composition. The effects on vegetation would be expected to be localized and occur intermittently during construction but could include vegetation smothering and changes to drainage patterns and infiltration in the area of sediment deposits.

9.4.4.3.4.2 Mitigation and Enhancement Measures

An environmental monitoring program will be developed and implemented during construction and will contain mitigation measures to control erosion and sedimentation. Erosion and sediment control measures will be developed and implemented in accordance with Ontario Provincial Standard Specifications for erosion and sediment control measures (Ministry of Transportation, 2021a, 2021c). Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction.

A comprehensive list of mitigation measures that will be implemented during construction is provided in Vegetation Technical Support Document (**Appendix J**) and Surface Water Technical Support Document (**Appendix F**). Mitigation measures to limit erosion and sedimentation are well understood and the methods have been demonstrated to be effective. The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.4.3.4.3 Predicted Residual Effects

As discussed in the Surface Water Technical Support Document (**Appendix F**), construction of the Community Access Road could result in localized increase in erosion-sedimentation processes at locations upstream or downstream of watercourse crossings and at receiving waterbodies. Environmental protection and monitoring plans

developed for the Community Access Road construction are expected to limit erosion and sedimentation. Localized increases in erosion-sedimentation processes at locations upstream or downstream of watercourse crossings and at receiving waterbodies could also occur during operations. After implementing mitigation, the Community Access Road is not predicted to result in residual effects bird habitat, relative to existing conditions. As such, this interaction was not carried forward in the assessment.

9.4.4.3.5 Changes to Birds from Impacts to Surface Water Quantity

9.4.4.3.5.1 Potential Effects

Habitat Availability and Distribution

Construction activities such as constructing watercourse crossings, vegetation clearing, short-term water takings, and discharge of construction water can cause changes to stream flows and / or water levels within or immediately upstream and downstream of the work area. Changes in the volume or rate of surface water during construction of the Community Access Road may adversely affect soils, peatland, wetland, and riparian ecosystems through desiccation or inundation. Peatland, wetland, and riparian ecosystems experience water level fluctuations as part of natural variability and riparian ecosystems can recover relatively quickly from flooding.

Fluctuating surface water levels typically influence plant species composition, community structure, and species richness, and preventing changes in wetland water levels can cause a decrease in aquatic plant community diversity. Alternatively, changes in the amplitude, frequency, and timing of flood or drought compared to historical levels can cause adverse effects on wetlands, riparian areas, and peatlands. These changes can alter bird habitat availability and distribution through localized changes in ecosystem composition, particularly peatland, wetland, and riparian areas.

9.4.4.3.5.2 Mitigation and Enhancement Measures

Environmental approval conditions, permits, or authorizations issued for the Community Access Road, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, Fisheries and Oceans Canada, and Ontario Ministry of Natural Resources, will be followed during construction. A comprehensive list of mitigation measures to limit changes to surface water quantity during construction is provided in the Surface Water Technical Support Document (**Appendix F**). Mitigation measures to limit changes to surface water quantity are well understood and the methods have been demonstrated to be effective. The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.4.3.5.3 Predicted Residual Effects

As discussed in the Surface Water Technical Support Document (**Appendix F**), changes to surface water quantity during the construction and operations phases are anticipated to be of negligible magnitude. As such, no net residual effects on bird habitat availability and distribution are predicted and this interaction is not carried forward into the assessment.

9.4.4.3.6 Changes to Birds from Impacts to Surface Water Quality

9.4.4.3.6.1 Potential Effects

Habitat Availability and Distribution

During construction, surface water may become contaminated if chemicals or substances (for example, petroleum products, sediments, and garbage) from project equipment, vehicles, road surfaces, or blasting sites are transported into surface water during precipitation events (Surface Water Technical Support Document [**Appendix F**]). This includes contamination of surface water from wash-off of organic debris during vegetation maintenance activities. Changes to surface water quality could have negative effects vegetation on bird habitat availability and distribution.

9.4.4.3.6.2 Mitigation and Enhancement Measures

Mitigation measures during construction of the Community Access Road include adherence to federal and provincial regulations and guidelines regarding collection and storage of explosives and solid waste, such as the federal Explosives Act. Additionally, during the winter periods of construction, sand will be used on the Community Access Road for de-icing instead of road salt, if required. Herbicides or pesticides will not be used at any stage of the Community Access Road construction. Environmental approval conditions, permits, or authorizations issued for the Community Access Road, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, Fisheries and Oceans Canada, and Ontario Ministry of Natural Resources, will be followed during construction. A comprehensive list of mitigation measures to limit changes to surface water quality during construction is provided in the Surface Water Technical Support Document (**Appendix F**). Mitigation measures to limit changes to surface water quality are well understood and the methods have been demonstrated to be effective. The effectiveness of mitigation measures will be evaluated during construction and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.4.3.6.3 Predicted Residual Effects

As discussed in the Surface Water Technical Support Document (**Appendix F**), changes to surface water quality during construction are anticipated to be of negligible magnitude. As such, no net residual effects on bird habitat availability and distribution are predicted and this interaction is not carried forward into the assessment.

9.4.4.3.7 Changes to Birds from Impacts and Changes to Groundwater

9.4.4.3.7.1 Potential Effects

Habitat Availability and Distribution

If aggregates are extracted from below the water table at pits or quarries the local groundwater levels would be lowered either by active dewatering or dredging. Active dewatering of aggregate pits or quarries would likely take place using a sump to collect water in the bottom of the pit or quarry and pumping the water out of the sump to discharge outside the pit / quarry area. Dredging would lower groundwater levels to a lesser degree than dewatering.

Pit dewatering and dredging may result in changes to groundwater levels of more than 50 percent of the natural seasonal variability (in other words, high magnitude effect; Groundwater Technical Support Document; **Appendix H**). Effects are considered probable to occur (Groundwater Technical Support Document; **Appendix H**). However, effects are anticipated to be reversible soon after construction ends (in other words, medium term) and confined to the Groundwater Effects Assessment Local Study Area (in other words, 1 kilometres from centreline of Preferred Route and associated construction areas; Groundwater Technical Support Document; **Appendix H**).

Road construction using “floating” techniques to cross areas of peatland will be designed with a pervious road base structure to allow for the flow of groundwater beneath and through the road base. However, there is potential for settlement of the road base structure and underlying peat material or sediment accumulation in the road base material to restrict the flow of groundwater. If the groundwater flow is restricted to a substantial degree, then the road may cause a damming effect with elevated groundwater levels on the upgradient side of the road and lowered groundwater levels on the downgradient side.

Settlement of the road base structure and underlying peat material or sediment accumulation in the road base material may result in changes to groundwater quantity that are between 20 percent and 50 percent higher / lower than existing condition values (in other words, medium magnitude effect) (Groundwater Technical Support Document; **Appendix H**). Effects from road settlement or sediment accumulation during

construction are possible to occur, anticipated to be confined to the Groundwater Effects Assessment Local Study Area, and anticipated to be reversible in the long term with implementation of mitigation (Groundwater Technical Support Document; **Appendix H**).

Alteration of groundwater levels due to project activities could have negative effects on bird habitat availability and distribution, particularly for wetland-dependent birds. Changes to vegetation communities are anticipated to be of medium magnitude and probable to occur (Vegetation Technical Support Document [**Appendix J**]; Peatlands Technical Support Document [**Appendix I**]).

9.4.4.3.7.2 Mitigation and Enhancement Measures

Environmental approval conditions, permits, or authorizations issued for the Community Access Road, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, Fisheries and Oceans Canada, and Ontario Ministry of Natural Resources, will be followed during construction. A comprehensive list of mitigation measures to limit changes to groundwater quantity during construction is provided in the Groundwater Technical Support Document (**Appendix H**). The effectiveness of mitigation measures will be evaluated during construction and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.4.3.7.3 Predicted Residual Effects

With the implementation of the recommended mitigation measures, changes to groundwater regimes will be minimized and impacts to retained vegetation communities and bird habitat availability and distribution should be minimal. However, there are still anticipated to be measurable changes to vegetation due to change to groundwater quantity, which are predicted to result in a residual effect on bird habitat availability and distribution. As such, this interaction is carried forward to the residual effects characterization.

Effects from changes to groundwater quantity are predicted to be probable, irreversible (long term), continuous, and confined to the effects assessment Local Study Area. Effects from changes to groundwater quantity on the ability of the bird populations in the effects assessment Regional Study Area to remain self-sustaining and ecologically effective are anticipated to be negative but negligible in magnitude.

9.4.4.3.8 Changes to Birds from Increase in Public Access

9.4.4.3.8.1 Potential Effects

Survival and Reproduction

Roads and access provide increased opportunities for humans to use an area, which can result in increased bird mortality from hunters and poachers and increased mortality of bird food sources (for example, fish) because linear features allow ease of access into previously inaccessible areas (Jalkotzy et al., 1997; Trombulak and Frissell, 2001). Indigenous Knowledge provided by Marten Falls First Nation included concerns related to effects on birds, bird habitat, and bird food sources as a result of increased public access and anthropogenic activities (for example, angling) (Marten Falls First Nation, 2023; MNP LPP, 2024b; Shared Value Solutions, 2024). One community member from Aroland First Nation noted the following regarding this potential effect, “The first thing I thought about was the wilderness, the animals would be disturbed. If the road goes through there, they’re travelling routes would be disrupted. And also, their feeding might be disrupted. As for the fish, I think if they build bridges and all that, it’s easier access for humans to go harvest. To me, that would be very destructive for the wildlife and fishery." (Shared Value Solutions, 2024). Concerns shared by Marten Falls First Nation discussed about how increased commercial and recreational fishing in the study areas might affect the food sources of bird species in the region (Marten Falls First Nation, 2023).

There is anticipated to be limited increase in public access during construction. However, a few individuals may illegally use constructed portions of the effects assessment Construction Disturbance Area to access areas that were previously inaccessible or more difficult to access for hunting or fishing.

9.4.4.3.8.2 Mitigation and Enhancement Measures

The following mitigation measures will be implemented during construction to limit effects from increases in public access:

- Restrict access to the effects assessment Construction Disturbance Area to construction personnel and prohibit firearms;
- Monitor central access corridors or have manned gate / security in place, during periods of high activity;
- Block winter roads and temporary access routes and trails that are no longer required; and
- Install access controls (for example, gates and boulders) to control public vehicle travel on some temporary access routes and trails.

The effectiveness of mitigation measures will be evaluated during and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.4.3.8.3 Predicted Residual Effects

Mitigation measures will be implemented to limit increases in public access during construction, and any increases in angler and hunting pressure during construction are anticipated to have no to minor impacts on birds and their food resources in the effects assessment Local and Regional Study Areas. As such, there is predicted to be no residual effect from increased access during construction.

9.4.4.3.9 Changes to Birds from Incidental Take

9.4.4.3.9.1 Potential Effects

Survival and Reproduction

The federal *Migratory Birds Convention Act*, 1994 and attendant Migratory Birds Regulation protect most migratory birds, their eggs, and nests. The modernized Migratory Birds Regulation, 2022 came into effect July 30, 2022, and protects nests of some species year-round, including pileated woodpecker. Pileated woodpecker nests are protected year-round for 36 months after last being used by any migratory bird that is protected under the Migratory Birds Regulation.

Raptors (for example, hawks and owls) are not protected under the *Migratory Birds Convention Act*, 1994; however, the *Fish and Wildlife Conservation Act* and attendant Wildlife Schedules protect several raptor species. Some raptor stick nests are protected from destruction as long as the nest is present; the nest does not have to be active to be protected.

Some birds are also protected under the federal *Species at Risk Act* and / or Ontario's *Endangered Species Act* and regulations. These acts protect residences (such as, nests) and individuals of species that are listed as "Extirpated," "Endangered," or "Threatened." Recommendations for listing under the *Species at Risk Act* come from the Committee on the Status of Endangered Wildlife in Canada, while recommendations for listing under the *Endangered Species Act* come from the Committee on the Status of Species at Risk in Ontario.

Eight species detected during existing conditions surveys are listed under the *Species at Risk Act* and / or the *Endangered Species Act*:

- Canada warbler ("Special Concern" under the *Endangered Species Act*; "Threatened" under the *Species at Risk Act* but under consideration for a status change);
- Common nighthawk ("Special Concern" under the *Endangered Species Act* and the *Species at Risk Act*);
- Eastern whip-poor-will ("Threatened" under the *Endangered Species Act* and the *Species at Risk Act* but under consideration for a status change under the *Species at Risk Act*);
- Eastern wood-pewee ("Special Concern" under the *Endangered Species Act* and the *Species at Risk Act*);
- Olive-sided flycatcher ("Special Concern" under the *Endangered Species Act* and the *Species at Risk Act*);
- Rusty blackbird ("Special Concern" under the *Endangered Species Act* and the *Species at Risk Act*);
- Yellow rail ("Special Concern" under the *Endangered Species Act* and the *Species at Risk Act*); and
- Lesser yellowlegs ("Threatened" under the *Endangered Species Act* and under consideration for listing under the *Species at Risk Act*).

Bird nests, eggs, and / or birds could be destroyed during land clearing and site preparation for construction. The ability of valued components to avoid or move away from construction activities can be extremely constrained during certain life history periods or stages. For example, although all adult bird valued components are extremely mobile, their nests, eggs, and fledglings are not. Direct removal of habitat during the nesting period can increase the risk of injury or mortality to adults and their young.

Removal of vegetation during construction of the Community Access Road may affect the survival and reproduction of a variety of bird species, as forested, wetland, shrub, and open habitats are anticipated to be disturbed during vegetation clearing activities.

9.4.4.3.9.2 Mitigation and Enhancement Measures

The migratory bird nesting season and timing of construction activities should be considered during the detail design and construction phases. It is estimated that 90

percent of species in nesting zones C5 and C6 will be actively nesting between April 28 and August 14 (Environment and Climate Change Canada, 2023c). Raptors, such as owls, nest earlier in year (from February through April). As such, during construction, clearing activities will occur between August 15 and April 27, outside the breeding season for most bird species, where possible. If any vegetation clearing is required during the migratory bird nesting season (April 28 to August 14; Environment and Climate Change Canada, 2023c), non-intrusive pre-clearing nest surveys will occur within seven days prior to clearing. If any areas are found to have birds exhibiting breeding behaviour, these areas, including an activity disturbance buffer, will be flagged and protected from disturbance until the fledglings have left the nest **Attachment D – Pre-Clearing Nest Sweep Protocol** of **Appendix L** provides a synopsis of the protocol of bird nest sweets.

Prior to site clearing, wildlife sweeps will also be completed outside of the nesting season to look for and document pileated woodpecker nesting cavities and raptor stick nests. Wildlife sweeps will be focused on mature and old growth forest dominated by deciduous trees as these habitats are most likely to have large trees that can support raptor stick nests and pileated woodpecker nests. Wildlife sweeps will be completed within 10 days prior to vegetation clearing. Raptor stick nests found during construction will be marked and isolated as Environmentally Sensitive Sites and setbacks from construction activities and / or staged construction activities will be implemented. If pileated woodpecker nest cavities are found during wildlife sweeps, the nests will be registered in the Abandoned Nest Registry and monitored for a minimum of 36 months to determine if the nests are actively being used by migratory birds. Any trees with pileated woodpecker nests will not be removed until they are determined to be inactive for at least 36 months after discovery.

The effectiveness of mitigation measures will be evaluated during construction and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.4.3.9.3 Predicted Residual Effects

The implementation of mitigation is anticipated to limit but not eliminate incidental take of migratory birds that may be nesting in the effects assessment Construction Disturbance Area. This is because it may not be possible to detect 100 percent of nests, particularly in complex forested habitat prior to site clearing for construction of the Community Access Road. As such there is a predicted net residual effect from the Project, and residual effects from incidental take were carried forward into the residual effects characterization.

Effects from incidental take are predicted to be possible, reversible in the medium term frequent and confined to the effects assessment Construction Disturbance Area. Effects from incidental take on the ability of the bird populations in the effects assessment Regional Study Area to remain self-sustaining and ecologically effective are anticipated to be negative but negligible in magnitude.

9.4.4.3.10 Changes to Birds from Collisions with Vehicles and Equipment

9.4.4.3.10.1 Potential Effects

Survival and Reproduction

Birds may be killed by collisions with construction vehicles and equipment. Low-flying species, such as grouse, owls, eastern whip-poor-will, and common nighthawk, or species that forage on and near roads (for example, short-eared owl and bald eagle) may have higher risk of collisions with vehicles and equipment (Silva et al., 2012; Foley, 2018; Mathieu et al., 2021). Construction traffic levels, and therefore mortality risk, will be much lower than during operations.

9.4.4.3.10.2 Mitigation and Enhancement Measures

Mitigation measures that will reduce potential collisions with construction vehicles and equipment are:

- Incorporating standard safe road design configurations in the detail design phase;
- Micrositing the Community Access Road to avoid high-quality habitats and sensitive areas, to the extent feasible;
- Avoiding high-quality habitats and sensitive areas for migratory bird species at risk, to the extent feasible;
- Providing wildlife awareness training for road construction workers to reduce vehicle speeds;
- Restricting access to the Community Access Road to construction personnel during construction;
- Restricting construction traffic to designated areas; and
- Blocking winter roads and temporary access routes and trails no longer required as construction proceeds.

The effectiveness of mitigation measures will be evaluated during construction and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.4.3.10.3 Predicted Residual Effects

The implementation of mitigation is anticipated to limit Project-related changes to the survival and reproduction of birds from increased collision risk with vehicles and equipment. However, there is a predicted net effect from this interaction and, so, residual effects were carried forward into the residual effects characterization.

Effects from increased bird-vehicle collisions are predicted to be possible, reversible in the medium term, frequent and confined to the effects assessment Construction Disturbance Area. Effects from increased bird-vehicle collisions during construction on the ability of the bird populations in the effects assessment Regional Study Area to remain self-sustaining and ecologically effective are anticipated to be negative but negligible in magnitude.

9.4.4.3.11 Changes to Birds from Wildlife Attractants

9.4.4.3.11.1 Potential Effects

Survival and Reproduction

Food smells and other aromatic compounds such as petroleum-based chemicals, grey water, and sewage could attract carnivores to temporary construction camps (Beckmann and Lackey, 2008; Canadian Wildlife Service, 2007; Peirce and Van Daele, 2006). Corvids and raptors may also be attracted to structures that can be used as hunting perches (for example, buildings and material stockpiles), and anthropogenic food sources at temporary construction staging areas and temporary construction camps (Baxter and Allan, 2008; Marzluff and Neatherlin, 2006; Restani et al., 2001; Fleming and Bateman, 2018).

Additionally, some bird species may use construction infrastructure and equipment as nesting habitat. For example, some bird species (such as, barn swallow) may use buildings that are present during construction (for example, camp buildings) and bridges as nesting habitat. Other species (such as, bank swallow) may use material stockpiles (for example, sand stockpiles) as nesting habitat. The use of infrastructure or equipment for nesting could result in inadvertent disturbance or destruction of bird nests by Community Access Road staff.

9.4.4.3.11.2 Mitigation and Enhancement Measures

The following mitigation will be implemented to deter birds from nesting on infrastructure during construction:

- Keeping building and storage container doors closed;

- Tarping or fully wrapping structures that have nesting potential (for example, camp buildings and shipping containers). It is important to avoid using nets or other cover types that could entangle birds and cause potential injury or mortality;
- Sealing cracks and holes where birds can enter structures;
- Place pallets and other small pieces of equipment low to the ground;
- Keeping heavy equipment free of mud, as mud can attract birds, particularly swallows, which use mud to build nests;
- Conducting frequent inspections of structures and equipment for evidence of birds, ideally every day during the nesting season, at dawn and dusk when birds are most active;
- The slopes of material stockpiles will be maintained at 70 degrees or less to deter bank swallow nesting;
- Hanging brightly coloured strips of fabric over slope faces to deter birds. These must be well secured and weighted at the bottom; and
- Placing geotextile, plastic covers, or tarping over slope faces or stockpiles to prevent access by birds. It is important to avoid using nets or other cover types that could entangle birds and cause potential injury or mortality.

Prepare an environmental monitoring program that will include policies and actions for handling and storage of waste as well as management of materials and stockpiles. The effects assessment Construction Disturbance Area would be kept clear of any attractants such as food scraps and food containers. Food waste will be collected and temporarily stored in wildlife-proof containers. The containers will be transported off site for recycling or disposed at a licensed disposal facility.

Mitigation measures to remove wildlife attractants are well understood and the methods have been demonstrated to be effective. The effectiveness of mitigation measures will be evaluated during construction and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.4.3.11.3 Predicted Residual Effects

Mitigation should limit wildlife attractants and attraction of birds and their predators to the Community Access Road. However, attraction could still occur. As such, this Project–environment interaction was predicted to have a net residual effect on bird populations and was carried forward into the residual effects characterization.

Effects are predicted to be **possible**, **irreversible** (**long term**) (for example, permanent aggregate piles and culverts), **continuous**, and confined to the **effects assessment Construction Disturbance Area**. Effects from wildlife attractants on the ability of the bird populations in the effects assessment Regional Study Area to remain self-sustaining and ecologically effective are anticipated to be **negative** but **negligible in magnitude**.

9.4.4.3.12 Changes to Birds from Blasting and Flying Rock

9.4.4.3.12.1 Potential Effects

Survival and Reproduction

During construction, explosives will be used at quarry sites to excavate materials for use during construction and to remove bedrock or large boulders in the right-of-way. Blasting activities may produce fly rock that has the potential to strike birds in the vicinity and cause injury or death. The risk of mortality from being struck by fly rock would be greatest for birds who occupy territories that overlap blasting sites, or for birds that are flying over blasting sites when blasting occurs.

9.4.4.3.12.2 Mitigation and Enhancement Measures

The presence of operating equipment, people, noise, and lights during construction is expected to result in some avoidance of the effects assessment Construction Disturbance Area by birds. An Environmental Protection Plan and Blasting and Communication Management Plan will be prepared and implemented during construction and will include policies and actions for avoiding and minimizing the risks of blasting and blasting materials to wildlife including birds. Industry best practices will be used for blasting activities, including adherence to Ontario Provincial Standard Specification 120 and NPC-119 (Final Acoustic and Vibration Technical Support Document [**Appendix P**]). Blasting will be completed as quickly as possible to shorten the duration of disturbance.

Quarry blasting and other construction activities will be suspended within 10 kilometres of known or potential High Use Areas during the migratory bird breeding season (April 28 to August 14) (Environment and Climate Change Canada, 2023c). If adherence to the timing windows and restrictions is not possible, the owner / operator will develop site-specific mitigation and monitoring in consultation with appropriate regulatory agencies. This may include implementation of a buffer zone survey around the perimeter of blasting activities and surrounding forested habitat, whereby blasting will be prohibited if raptor stick nests are observed within 500 metres from the blasting location.

An environmental monitoring program will be prepared and implemented during construction and will include policies and actions for avoiding and minimizing the risks of blasting and blasting materials to wildlife including birds. Best management practices will be included in the environmental monitoring program and at a minimum will include recommendations for pre-blast surveys for migratory birds, bird nest sweeps, habitat assessments for migratory birds, and noise and vibration control (for example, using smaller, more controlled charges, or staggering blasting etc.).

The effectiveness of mitigation measures will be evaluated during construction and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.4.3.12.3 Predicted Residual Effects

Due to the infrequent timing of blasting, and with the implementation of mitigation, blasting and fly rock from the Community Access Road during construction is not expected to result in injury or mortality to birds. There is no net effect predicted for this Project–environment interaction on bird survival and reproduction. Therefore, this interaction was not carried forward in the assessment.

9.4.4.3.13 Changes to Birds from Chemical or Hazardous Material Spills

9.4.4.3.13.1 Potential Effects

Survival and Reproduction

During construction of the Community Access Road, there is the potential for accidental spills of fuels and other materials resulting in the release of deleterious substances and soil contamination from malfunctions of equipment such as hydraulic and fluid leaks, spills during equipment or vehicle refuelling, and from vehicle collisions. Spills that occur in high enough concentrations can contaminate soils and affect aquatic organisms, soil organisms, vegetation, and wildlife, including birds. Direct exposure to the chemical through ingestion of contaminated water, soil or vegetation could result in acute or chronic illness or death. As a result, there is potential that construction of the Community Access Road could cause chemical / hazardous material spills that could negatively affect the survival and reproduction of bird populations in the Bird effects assessment Local Study Area. More information on potential effects from chemical or hazardous material spills on surface water and groundwater quality is presented in the Surface Water Technical Support Document (**Appendix F**) and Groundwater Technical Support Document (**Appendix H**).

9.4.4.3.13.2 Mitigation and Enhancement Measures

Mitigation measures during construction of the Community Access Road include adherence to federal and provincial regulations and guidelines regarding fuel and residue, chemical product, petroleum product, and hazardous substance collection and storage, use and handling, and disposal and treatment, such as the federal *Transportation of Dangerous Goods Act*, Ontario *Dangerous Goods Handling and Transportation Act* (Government of Ontario, 1990a), and the Ontario *Environmental Protection Act* (Government of Ontario, 1990b). Additionally, an environmental monitoring program will be developed and implemented and will include policies and actions for limiting effects from spills on bird habitat.

A comprehensive list of mitigation measures to limit changes to surface water and groundwater quality from spills during construction is provided in the Surface Water Technical Support Document (**Appendix F**) and the Groundwater Technical Support Document (**Appendix H**). Mitigation measures to limit chemical or hazardous material spills are well understood and the methods have been demonstrated to be effective. The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.4.3.13.3 Predicted Residual Effects

As discussed in the Vegetation Technical Support Document **(Appendix J**), Peatlands Technical Support Document (**Appendix I**), Surface Water Technical Support Document (**Appendix F**), Groundwater Technical Support Document (**Appendix H**), and Physiography, Terrain, and Soils Technical Support Document (**Appendix N**), there are predicted to be no residual effects from chemical or hazardous material spills on surface water quality, groundwater, soil, or vegetation quality during the construction and operations phases. As such there was predicted to be no net effect on bird survival and reproduction, relative to existing conditions. Therefore, the potential effects of chemical or hazardous material spills were not carried forward in the assessment.

9.4.4.3.14 Changes in Individual Bird Species

Information on individual bird species assessed can be found in Birds Technical Support Document (Appendix L). The following bird species were assessed:

- Forest Birds: Red-eyed Vireo, Oven bird, Dark-eyed Junco
- Raptors: Osprey, Boreal Owl
- Shorebirds: Wilson’s Snipe
- Waterfowl and Waterbirds: Mallard

- Bog / Fen Birds and Other Wetland Birds: Palm Warbler, Common Yellowthroat, Northern Waterthrush, Sora
- Species at Risk Birds: Canada Warbler, Evening Grosbeak, Chimney Swift, Bank Swallow, Barn Swallow, Common Nighthawk, Eastern Whip-poor-will, Eastern Wood-pewee, Olive-sided Flycatcher, Bald Eagle, Peregrine Falcon, Short-eared Owl, Black Tern, Lesser Yellowlegs, Rusty Blackbird, Yellow Rail

9.4.4.3.14.1 Potential Effects

Habitat Loss and Alteration

Habitat Availability

Vegetation clearing for the Community Access Road during construction is predicted to remove areas of high suitability and moderate suitability bird breeding habitat. High and moderate suitability habitat remains abundant in the effects assessment Regional Study Area. The Bird Technical Supporting Document (Appendix L) includes details on predicted habitat loss for each individual species listed.

Distribution

There is a higher proportion of high suitability habitat in the effects assessment Construction Disturbance Area (approximately 50 percent of the study area) than in the effects assessment Local Study Area and effects assessment Regional Study Area (approximately 40 percent of each study area). This is due to the selection of upland habitat for the Preferred Route.

It is anticipated that moderate and high suitability habitat in the effects assessment Regional Study Area is below carrying capacity for birds. As such, during construction of the Community Access Road, individuals returning during spring migration that previously used habitats in the effects assessment Construction Disturbance Area are expected to establish breeding territories in suitable habitat outside of the effects assessment Construction Disturbance Area.

In addition to the change in location of some breeding territories, the creation of a linear disturbance may cause birds in the effects assessment Local Study Area to shift their territories away from the effects assessment Construction Disturbance Area. A study in the boreal forest of the Northwest Territories found that some passerine bird species move their territories away from human linear disturbance features (Machtans, 2006).

After implementation of the Community Access Road, there are 252.2 kilometres of linear disturbance in the effects assessment Local Study Area and 309.0 kilometres of linear disturbance in the effects assessment Regional Study Area. Permanent

components are the Community Access Road and the access roads to aggregate pits (total 249.4 kilometres); non-permanent components are camp access roads (total 2.8 kilometres).

After implementation of the Community Access Road, the linear disturbance density for permanent and non-permanent linear disturbances (combined) in the effects assessment Local Study Area increases from is 0.17 kilometres / square kilometres (existing conditions) to <0.00 kilometres per square kilometre. Linear disturbance density in the effects assessment Regional Study Area increases from and 0.04 kilometres / square kilometres (existing conditions) to 0.06 kilometres / square kilometres.

The effects assessment Construction Disturbance Area may act also as a barrier to birds movements during foraging (Norris and Stutchbury, 2001; Fraser and Stutchbury, 2004; MacIntosh et al., 2011) and dispersal (Tittler et al., 2009). The effects assessment Construction Disturbance Area is assumed to be wider than the proposed corridor; vegetation will be permanently cleared within a 60-metre wide corridor. Also, there is a large amount of undisturbed habitat in the effects assessment Regional Study Area that remains available for birds. As such, overall movement patterns of birds in the effects assessment Regional Study Area are expected to remain unchanged with the addition of the Community Access Road.

The removal of habitat due to the Construction of the Project is predicted to result in a change to the distribution of bird breeding territories and movements in the effects assessment Regional Study Area.

Survival and Reproduction

Habitat loss from Construction of the Community Access Road could affect bird survival and reproduction if individuals return to breeding grounds to find habitat removed and subsequently are unable to establish a new territory or are forced to establish a territory in lower quality habitat. Construction of the Community Access Road is predicted to remove high and moderate suitability habitat that is available in the effects assessment Regional Study Area during existing conditions.

Sensory Disturbance

Habitat Availability

Sensory disturbance (for example, presence of workers and noise from construction equipment) during construction of the Community Access Road could result in the indirect loss or degradation of suitable bird habitat if individuals avoid areas with sensory disturbance. As the precise threshold of avoidance by birds due to sensory

disturbance is not known, habitat that was within 300 metres of the Community Access Road was assumed to be negatively affected by sensory disturbance as a precautionary approach.

During construction, activities will be primarily confined to daylight hours and will be of relatively short duration (in other words, confined to the start and end of Construction of each road segment). Additionally, effects from sensory disturbance during construction will be confined to when birds are present in the effects assessment Local Study Area (in other words, during the migration and breeding seasons).

Distribution

Sensory disturbance during construction may have a negative effect on bird movements and habitat connectivity if individuals avoid areas with sensory disturbance. Sensory disturbance effects during construction will be lower than during operations. During construction, sensory disturbance is expected to primarily occur during the day and will occur for relatively short durations at one location (in other words, confined to the start and end of construction of road segments). After construction of a road segment is complete, sensory disturbance at that location will be relatively low until road Operations commence.

Survival and Reproduction

The effects of noise on the survival and reproduction of birds are unknown but noise levels above 48 decibels have been shown to reduce abundance and pairing success of some songbird species (Habib et al., 2007; Bayne et al., 2008). Other potential effects from noise include interference with communication (for example, reducing ability to hear intraspecific vocalizations) and increased risk of predation (for example, reducing ability to hear approaching predators) (Ortega, 2012). Environment and Climate Change Canada (2023d) indicates that noise levels greater than 50 decibels or 10 decibels above ambient (background) noise can negatively affect birds.

Noise levels (existing conditions + Community Access Road) will reach 50 A-weighted decibels at 600 metres from the edge of the effects assessment Construction Disturbance Area during road and bridge construction. Noise levels at quarries during construction will reach 50 A-weighted decibels at 1,000 metres from the edge of the effects assessment Construction Disturbance Area (Acoustic and Vibration Environment Technical Support Document [**Appendix P**]).

During construction, sensory disturbance will primarily occur during the day; nighttime construction will be limited. Sensory disturbance during construction will occur for relatively short durations at one location (in other words, confined to the start and end of construction of road segment).

Increase in Edge Habitat

Survival and Reproduction

Vegetation removal during construction will result in increased edge habitat in forested areas and could have negative effects on bird survival and reproduction. Mitigation measures that will be implemented to minimize direct loss of forested vegetation communities, and therefore limit increases in edge habitat, are discussed in detail in the Vegetation Technical Support Document (**Appendix J**).

The effectiveness of mitigation measures will be evaluated during construction and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.4.3.14.2 Mitigation and Enhancement Measures

Habitat Loss and Alteration

Vegetation removal during construction will result in the direct loss of upland vegetation communities and result in changes to bird habitat availability, distribution, and survival and reproduction. Mitigation measures that will be implemented to minimize direct loss of upland vegetation communities are discussed in detail in the Vegetation Technical Support Document (**Appendix J**). These mitigations include:

- Limit the Community Access Road footprint to the extent feasible;
- Use existing access roads where possible; and
- Where possible, decommission and rehabilitate temporary access roads, staging areas, camps, and debris and / or timber stockpiles following Construction.

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources will be followed during construction. The effectiveness of mitigation measures will be evaluated during construction and mitigation measures will be modified or enhanced as necessary through adaptive management.

Sensory Disturbance

The following mitigation measures will be implemented to limit effects from sensory disturbance during construction on birds:

- Complete work as quickly as possible to shorten the duration of disturbance;

- The migratory bird nesting season and timing of activities should be considered during construction. Clearing activities should occur from August 15 to April 27 (outside the migratory bird nesting season); if any clearing is required during the breeding bird season, non-intrusive pre-clearing nest surveys will occur within seven days of the clearing; buffers will be established around each nest, and clearing activities will be restricted near active bird nests or pileated woodpecker nest cavities;
- Follow guidance as outlined in Environment and Climate Change Canada's Avoidance Guidelines for Migratory Birds;
- Surveys will be conducted for ecologically sensitive sites prior to Construction; marking, isolation and setbacks implemented if these sites are found;
- Control lighting required for construction of the Community Access Road, including direction (for example, focused on work areas and away from undisturbed areas) and timing (for example, minimize work at night) to minimize effects on birds, while meeting health and safety requirements;
- Wildlife awareness training will be provided for road construction workers to reduce vehicle speeds and associated noise and dust emission levels;
- Restricting construction traffic to designated areas;
- Industry best practices will be used for blasting activities, including scheduling outside of sensitive periods when in the vicinity of sensitive wildlife sites;
- Multi-passenger vehicles (for example, buses) will be used to transport workers to site when practicable; and
- Environmental approval conditions, permits, or authorizations issued for the Community Access Road, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction.

The effectiveness of mitigation measures will be evaluated during construction and mitigation measures will be modified or enhanced as necessary through adaptive management.

Increase in Edge Habitat

The construction of the Community Access Road will increase the amount of edge habitat, relative to existing conditions, and effects from changes to predator communities and increased predation risk will occur throughout construction. The

implementation of mitigation and enhancement measures is expected to limit negative effects but there is a predicted net residual effect on bird survival and reproduction.

9.4.4.3.14.3 Predicted Residual Effects

Habitat Loss and Alteration

Even after mitigation, potential breeding habitat will be removed by the Community Access Road. Habitat loss will initially occur during construction. The implementation of mitigation and enhancement measures is expected to limit negative effects. However, there are predicted net residual effects on bird habitat availability, distribution, and survival and reproduction during construction.

Residual effects from habitat loss on the ability of the bird population in the effects assessment Regional Study Area to remain self-sustaining and ecologically effective are anticipated to be negative but low in magnitude. As such, this Project–environment interaction is carried forward to the cumulative effects. These predicted residual effects are applicable to Red-eyed Vireo, Ovenbird, Dark-eyed Junco, Osprey, Boreal Owl, Wilson's Snipe, Mallard, Palm Warbler, Common Yellowthroat, Northern Waterthrush, Sora, Canada Warbler, Evening Grosbeak, Chimney Swift, Barn Swallow, Bank Swallow, Common Nighthawk, Eastern Whip-poor-will, Eastern Wood-Pewee, Olive-sided Flycatcher, Bald Eagle, Peregrine Falcon, Short-eared Owl, Black Tern, Lesser Yellowlegs, Rusty Blackbird and Yellow Rail.

Sensory Disturbance

Even after implementation of mitigation, potential bird breeding habitat may be indirectly removed or degraded due to sensory disturbance during construction of the Community Access Road. As such, there are predicted net residual effects on bird habitat availability, distribution, and survival and reproduction during construction.

Residual effects from sensory disturbance on the ability of the bird population in the effects assessment Regional Study Area to remain self-sustaining and ecologically effective are anticipated to be negative but low in magnitude. As such, this Project–environment interaction is carried forward to cumulative effects. These predicted residual effects are applicable to Red-eyed Vireo, Ovenbird, Dark-eyed Junco, Osprey, Boreal Owl, Wilson's Snipe, Mallard, Palm Warbler, Common Yellowthroat, Northern Waterthrush, Sora, Canada Warbler, Evening Grosbeak, Chimney Swift, Barn Swallow, Bank Swallow, Common Nighthawk, Eastern Whip-poor-will, Eastern Wood-Pewee, Olive-sided Flycatcher, Bald Eagle, Peregrine Falcon, Short-eared Owl, Black Tern, Lesser Yellowlegs, Rusty Blackbird and Yellow Rail.

Increase in Edge Habitat

The Construction of the Project will increase the amount of edge habitat, relative to existing conditions, and effects from changes to predator communities and increased predation risk will occur throughout Construction and Operations. The implementation of mitigation and enhancement measures is expected to limit negative effects but there is a predicted net residual effect on bird survival and reproduction.

Effects from increased edge habitat are predicted to be probable to occur, irreversible (long term), continuous, and confined to the effects assessment Local Study Area.

Residual effects from increased edge habitat on the ability of the bird population in the effects assessment Regional Study Area to remain self-sustaining and ecologically effective are anticipated to be negative but low in magnitude. As such, this Project–environment interaction is carried forward to the Cumulative Effects Assessment for birds. These predicted residual effects are applied to Red-eyed Vireo, Ovenbird, Palm Warbler, Northern Waterthrush, Common Nighthawk, Eastern Whip-poor-will and Short-eared Owl.

9.4.4.4 Residual Effects – Operations

9.4.4.4.1 Changes to Birds through the Introduction of Invasive Plant Species

9.4.4.4.1.1 Potential Effects

During the Operation Phase, regular vehicle traffic on the Community Access Road could transport invasive plant seeds or plant parts into the effects assessment Construction Disturbance Area. Effects from the introduction and spread of invasive plants during operations would be the same as for Construction (see section above). If invasive plant species are introduced and spread within the effects assessment Construction Disturbance Area, this could degrade the quality of habitats used by birds (for example, suitable foraging habitat), ultimately reducing the availability and distribution of suitable habitat during the Operation Phase.

9.4.4.4.1.2 Mitigation and Enhancement Measures

As per the Ministry of Transportation's Weed Control Maintenance Best Practice (MBP-320), invasive plant species in the effects assessment Construction Disturbance Area will be controlled using a combination of biological, cultural, manual, and mechanical control methods during operations (Ministry of Transportation, 2003). Herbicides or pesticides will not be used during the Community Access Road operations phases.

A comprehensive list of mitigation measures to control invasive plant species during operations is provided in the Vegetation Technical Support Document (**Appendix J**) and the Peatlands Technical Support Document (**Appendix I**).

9.4.4.4.1.3 Predicted Residual Effects

Invasive plant species may occasionally be introduced within the effects assessment Construction Disturbance Area during Operations. Introduction of invasive plant species may be higher during Operations due to public use of the Community Access Road. As such, the Project is expected to have net residual effects on birds and their habitats, relative to existing conditions and this interaction was carried forward into the residual effects characterization.

Effects from the introduction of invasive plants on the ability of the bird populations in the effects assessment Regional Study Area to remain self-sustaining and ecologically effective are anticipated to be negative but negligible in magnitude. This Project-environment interaction was not carried forward to cumulative effects.

9.4.4.4.2 Changes to Birds from Emissions of Criteria Air Contaminants

9.4.4.4.2.1 Potential Effects

During the Operation Phase of the Project, emissions would be generated mainly from the use of fossil fuels associated with vehicle use of the Project and road maintenance (general, seasonal, and special maintenance). As discussed in the Atmospheric Environment Technical Support Document (**Appendix S**), air criteria contaminants were predicted to be below Canadian Ambient Air Quality Standards and / or Ontario Ambient Air Quality Criteria thresholds during the Operation Phase.

9.4.4.4.2.2 Mitigation and Enhancement Measures

A Project-specific environmental monitoring program will be developed and will contain mitigation measures to control dust and air emissions during Maintenance. A comprehensive list of mitigation measures that will be implemented to limit air particulate emissions during Operations is provided in the Atmospheric Environment Technical Support Document (**Appendix S**).

9.4.4.4.2.3 Predicted Residual Effects

As discussed in the Vegetation Technical Support Document (**Appendix J**) and the Peatlands Technical Support Document (**Appendix I**), emissions of criteria air contaminants are anticipated to have negligible, possible effects on vegetation ecosystems, and, ultimately, bird habitat. As such, this interaction was determined to

have no residual effects on bird habitat availability and distribution and is not carried forward in the assessment.

9.4.4.4.3 Changes to Birds from Fugitive Dust Emissions

9.4.4.4.3.1 Potential Effects

Habitat Availability and Distribution

Fugitive dust emissions are expected to be produced during Operations from activities such as travel on the gravel Community Access Road. Potential effects from fugitive dust emissions on bird habitat availability and distribution are outlined in the Construction section above.

During Operations, threshold exceedances for the Project are predicted for particulate matter less than 2.5 micrometres, particulate matter less than 10 micrometres and total suspended particulate. The particulate matter less than 2.5 micrometres levels are predicted to reach the 24-hour and annual criteria thresholds at 115 metres and 134 metres from the road, respectively. Levels of particulate matter less than 10 micrometres are predicted to reach the 24-hour threshold at 1,986 metres from the road. Emissions of total suspended particulate are predicted to reach the 24-hour and annual thresholds at 3,004 metres and 899 metres from the road, respectively.

9.4.4.4.3.2 Mitigation and Enhancement Measures

A Project-specific environmental monitoring program will be developed and will contain mitigation measures to control dust and air emissions during Operations. A comprehensive list of mitigation measures that will be implemented to limit dust deposition during operations is provided in the Atmospheric Environment Technical Support Document (**Appendix S**).

9.4.4.4.3.3 Predicted Residual Effects

Effects on bird habitat availability and distribution from dust emissions are predicted to be larger during Operations due to continuous use of the road by several hundred vehicles per day. Additionally, mitigation measures to limit dust emissions are predicted to be less effective during Operations, the Community Access Road will be used by public vehicles. Dust deposition, particularly during Operations, is predicted to result in negligible but certain changes to vegetation quality in the effects assessment Local Study Area (Vegetation Technical Support Document (**Appendix J**) and the Peatlands Technical Support Document (**Appendix I**).]). As such, there is a predicted net residual effect on bird habitat availability and distribution through the operations phase. The

residual effects from dust emissions were carried forward into the residual effects assessment characterization.

Effects from dust emissions are predicted to be certain, irreversible (long term) (Operations), continuous, and confined to the effects assessment Local Study Area. Effects from dust emissions on the ability of the bird populations in the effects assessment Regional Study Area to remain self-sustaining and ecologically effective are anticipated to be negative but negligible in magnitude. As such, this Project–environment interaction is carried forward to cumulative effects.

9.4.4.4.4 Changes to Birds from Erosion and Sedimentation

9.4.4.4.4.1 Potential Effects

Habitat Availability and Distribution

Erosion and release of sediments in watercourses and adjacent terrestrial habitat may also occur during operations. Large precipitation events may lead to run-off from the road and sedimentation in low lying areas such as wetland and riparian habitats. Similar to Construction, the effects would be localized, intermittent and variable throughout the year.

9.4.4.4.4.2 Mitigation and Enhancement Measures

An environmental monitoring program will be developed and implemented during Maintenance and will contain mitigation measures to control erosion and sedimentation. Similar to Construction, erosion and sediment control measures will be developed and implemented in accordance with Ontario Provincial Standard Specifications for erosion and sediment control measures (Ministry of Transportation, 2021a, 2021c) during operations. Additionally, mitigation identified in the Ministry of Transportation's Maintenance Quality Standards and Maintenance Best Practices for highway maintenance (Ministry of Transportation, 2003) will be implemented to minimize erosion and sedimentation during operations. The mitigation measures established and refined using adaptive management during Project Construction should be maintained during operations.

A comprehensive list of mitigation measures that will be implemented during Operations is provided in Vegetation Technical Support Document (**Appendix J**) and Surface Water Technical Support Document (**Appendix F**).

9.4.4.4.4.3 Predicted Residual Effects

As discussed in the Surface Water Technical Support Document (**Appendix F**) localized increases in erosion-sedimentation processes at locations upstream or downstream of watercourse crossings and at receiving waterbodies could also occur during Operations. After implementing mitigation, the Project is not predicted to result in residual effects bird habitat, relative to existing conditions. As such, this interaction was not carried forward in the assessment.

9.4.4.4.5 Changes to Birds from Impacts to Surface Water Quantity

9.4.4.4.5.1 Potential Effects

Habitat Availability and Distribution

Conversion of treed and peatland habitats to open or shrubby habitats could result in changes to surface water quantity during Operations of the Community Access Road (Surface Water Technical Support Document; **Appendix F**).

9.4.4.4.5.2 Mitigation and Enhancement Measures

The mitigation measures established and refined using adaptive management during Project Construction should be maintained during Operations. Follow Ontario Provincial Standard Specification 411 and regularly inspect and maintain culverts and bridges. Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, Fisheries and Oceans Canada, and Ontario Ministry of Natural Resources, will be followed during Operations. A comprehensive list of mitigation measures to limit changes to surface water quantity during operations is provided in the Surface Water Technical Support Document (**Appendix F**).

9.4.4.4.5.3 Predicted Residual Effects

As discussed in the Surface Water Technical Support Document (**Appendix F**), changes to surface water quantity during Operations are anticipated to be of negligible magnitude. As such, no net residual effects on bird habitat availability and distribution are predicted and this interaction is not carried forward into the assessment.

9.4.4.4.6 Changes to Birds from Impacts to Surface Water Quality

9.4.4.4.6.1 Potential Effects

Habitat Availability and Distribution

During Operations, contamination of surface water may occur from garbage (Surface Water Technical Support Document; **Appendix F**).

9.4.4.4.6.2 Mitigation and Enhancement Measures

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, Fisheries and Oceans Canada, and Ontario Ministry of Natural Resources, will be followed during Operations. During the winter periods, sand will be used on the Community Access Road for de-icing instead of road salt. Herbicides or pesticides will not be used during the Community Access Road during operations. The mitigation measures established and refined using adaptive management during Project Construction should be maintained during operations. A comprehensive list of mitigation measures to limit changes to surface water quality during operations is provided in the Surface Water Technical Support Document (**Appendix F**).

9.4.4.4.6.3 Predicted Residual Effects

As discussed in the Surface Water Technical Support Document (**Appendix F**), changes to surface water quality during Operations are anticipated to be of negligible magnitude. As such, no net residual effects on bird habitat availability and distribution are predicted and this interaction is not carried forward into the assessment.

9.4.4.4.7 Changes to Birds from Impacts and Changes to Groundwater

9.4.4.4.7.1 Potential Effects

Effects from changes to groundwater levels on bird habitat availability and distribution from the potential settlement of the road base structure and underlying peat material, and from potential sediment accumulation in the road base material restricting the flow of groundwater, may continue through Operations of the Community Access Road.

9.4.4.4.7.2 Mitigation and Enhancement Measures

The mitigation measures established and refined using adaptive management during construction should be maintained during Operations. Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from

Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, Fisheries and Oceans Canada, and Ontario Ministry of Natural Resources, will be followed during Operations. As discussed in the Groundwater Technical Support Document (**Appendix H**) the mitigation measures established and refined using adaptive management during construction should be maintained during Operations. It is expected that a robust monitoring program will be undertaken, and adaptive management measures implemented, as required. This monitoring program is described in more detail in the Peatlands Technical Support Document (**Appendix I**).

9.4.4.4.7.3 Predicted Residual Effects

With the implementation of the recommended mitigation measures, changes to groundwater regimes will be minimized and impacts to retained vegetation communities and bird habitat availability and distribution should be minimal. However, there are still anticipated to be measurable changes to vegetation due to change to groundwater quantity, which are predicted to result in a residual effect on bird habitat availability and distribution. As such, this interaction is carried forward to the residual effects characterization.

Effects from changes to groundwater quantity are predicted to be probable, irreversible (long term), continuous, and confined to the effects assessment Local Study Area. Effects from changes to groundwater quantity on the ability of the bird populations in the effects assessment Regional Study Area to remain self-sustaining and ecologically effective are anticipated to be negative but negligible in magnitude. As such, this Project–environment interaction is carried forward to cumulative effects.

9.4.4.4.8 Changes to Birds from Increase in Public Access

9.4.4.4.8.1 Potential Effects

During Operations, the Community Access Road is likely to increase access for hunters and anglers in the Birds effects assessment Local and Regional Study Areas.

There is a hunting season for waterfowl (for example, ducks and geese), grouse and allies (for example, ptarmigan [Oji-Cree translation, wabihse] [Lagopus spp.]), American coot (Fulica americana), and Wilson’s snipe (Gallinago delicata) in the Effects Local and Regional Study Areas. The hunting of waterfowl, Wilson’s snipe, and American coot is regulated by Environment and Climate Change Canada under the Migratory Birds Conservation Act, while the hunting of grouse and allies is regulated by the Ontario Ministry of Natural Resources.

Indigenous Knowledge shared by communities including Aroland First Nation, Constance Lake First Nation, Fort Albany First Nation, and Marten Falls First Nation have identified that birds including geese, duck, ruffed grouse are traditional food sources and are hunted by community members (Fort Albany First Nation, 2020; LeBlanc, 2014; Marten Falls First Nation, 2023; Stantec, 2017b). Aroland First Nation has also noted that there has been a shift from local to processed foods, as well as from harvested to purchased foods in recent years (LeBlanc, 2014).

Within Marten Falls First Nation, a cultural week-long break is often taken each year (usually at the end of April), by community members to participate in hunting activities and celebrations surrounding the harvest of waterfowl (Dillon, 2026). Indigenous Knowledge provided by Constance Lake First Nation and Marten Falls First Nation also identified that Kenogamisis Lake, Kenogamisis River, Goldfield Lake, the Albany River rapids, and nearby connecting waterbodies are areas of importance for some bird species, in particular, ducks and ruffed grouse (Marten Falls First Nation, 2023; Stantec, 2017a,b).

During Operations, increased fish harvest may decrease the productivity of fish populations, but it is not likely to disrupt overall population dynamics and fish populations are anticipated to remain functional, self-sustaining, and ecologically effective. Increase in harvest pressure is mainly expected to be on larger waterbodies with known productive fisheries (Fish and Fish Habitat Technical Support Document; **Appendix G**). As such, changes to prey resources from the Project are not predicted have a measurable effect on the survival and reproduction of fish-dependent bird species (for example, osprey and bald eagle).

There is currently a small risk of human-caused mortality or changes to bird food resources from increased public access / hunting of birds in the effects study areas due to the isolation of the Project and the small human population in northern Ontario. The Project is likely to facilitate human access to the Local and Regional Effects Study Areas, which may result in increased fishing, and hunting and illegal harvesting of birds. However, the distance of the Project from the nearest large urban centre, inaccessible terrain, and the lack of roads and trails throughout most of the effects assessment Local Study Area and Regional Study Area is expected to limit increases in the number of anglers, hunters, and poachers that may access via the Project.

9.4.4.4.8.2 Mitigation and Enhancement Measures

The following mitigation measures will be implemented during Operations to limit effects from increases in public access:

- Potential changes in hunter and angler pressure, and fish and bird harvest will continue to be managed by Environment and Climate Change Canada, Ministry of Natural Resources, and Fisheries and Oceans Canada through licensing requirements and by establishing rules in terms of season length, bag / catch limits, and catch-and-release rules for waterbodies near the Project. Local communities will be responsible for managing their resources by limiting fish catch to a sustainable level for each species.

9.4.4.4.8.3 Predicted Residual Effects

The Project may increase hunting, fishing, and poaching during Operations, relative to existing conditions. There are currently no plans to decommission the Community Access Road and effects from increased public access are expected over the life of the Project. As such, there is a predicted net residual effect on bird survival and reproduction, relative to existing conditions and this interaction was carried forward into the residual effects characterization.

Effects from increases in public access are predicted to be possible, irreversible (long term), continuous, and confined to the effects assessment Regional Study Area. Effects from increased hunting and poaching on the ability of the bird populations in the effects assessment Regional Study Area to remain self-sustaining and ecologically effective are anticipated to be negative but negligible in magnitude. As such, this Project–environment interaction is carried forward to cumulative effects.

9.4.4.4.9 Changes to Birds from Incidental Take

9.4.4.4.9.1 Potential Effects

Survival and Reproduction

Bird nests, eggs, and / or birds could be destroyed during vegetation control activities in roadside ditches and rest areas during Operations. As per the Ministry of Transportation's Brush Control Maintenance Quality Standard (MQS-324) and Grass Control Maintenance Quality Standard (MQS-326), for roads with an 80 kilometres per hour speed limit, such as that proposed for the Project, mowing and brush clearing are required within 185 metres of road signs and other objects that need to be seen (for example, guide rails) (Ministry of Transportation, 2003). During operations, inspections of the road and rest areas will occur two days of each week and, based on these

inspections, mowing will be completed to maintain vegetation below 2 metres in height (Ministry of Transportation, 2003). As per the Ministry of Transportation's Rest Area/Picnic Site Maintenance Best Practice (MBP-325) and Tree Control Maintenance Best Practice (MBP-321), the weekly highway and rest area inspections will also note any trees that may need to be pruned or remove to maintain road and rest area safety.

Tree pruning and removal will occur throughout spring, summer, and fall, while mowing is expected to start in June or July and continue through September. Pruning and removal of hazardous trees during operations may negatively affect the survival and reproduction of tree-nesting species. Mowing of roadside ditches and rest areas is predicted to primarily affect the survival and reproduction of ground-nesting birds that require open, grassy habitats (for example, mallard).

9.4.4.4.9.2 Mitigation and Enhancement Measures

The migratory bird nesting season and timing of activities should be considered during Maintenance. As per the Ministry of Transportation's Environmental Protection for Migratory Birds (EP-4) (Ministry of Transportation, 2003), bridges and culverts will be inspected for the presence of birds and / or nests prior to maintenance activities commencing. If an active nest is found on a culvert or bridge, a Migratory Bird (Damage) Permit must be obtained for the nest. Depending on the species and if there are no young birds in the nest, the nest may be removed under the Permit after it is obtained.

9.4.4.4.9.3 Predicted Residual Effects

The implementation of mitigation is anticipated to limit but not eliminate incidental take of migratory birds that may be nesting in the effects assessment Construction Disturbance Area. There is potential for incidental take of migratory birds if vegetation clearing or mowing during Operations is completed during the migratory bird nesting season. As such there is a predicted net residual effect from the Project, and residual effects from incidental take were carried forward into the residual effects characterization.

Effects from incidental take are predicted to be possible, irreversible in the long term, infrequent (Operations), and confined to the effects assessment Construction Disturbance Area. Effects from incidental take on the ability of the bird populations in the effects assessment Regional Study Area to remain self-sustaining and ecologically effective are anticipated to be negative but negligible in magnitude. As such, this Project–environment interaction is carried forward to cumulative effects.

9.4.4.4.10 Changes to Birds from Collisions with Vehicles and Equipment

9.4.4.4.10.1 Potential Effects

Survival and Reproduction

A total of 700 vehicles per day have been modelled to be using the north-south (to the Northern Road Link Project Road) segment of the Project, and 100 vehicles per day have been modelled to be using the east-west segment (to Marten Falls First Nation). Most vehicular traffic on the north-south segment of the Project will be medium and heavy truck usage, consisting of 71 percent of traffic. Most traffic on the east-west section of the Project is expected to be light vehicle traffic (77 percent of all traffic) (**Appendix W**). The increase in Project-related traffic during Operations may increase the number of bird-vehicle collisions relative to existing conditions.

9.4.4.4.10.2 Mitigation and Enhancement Measures

Mitigation measures that will reduce potential bird-vehicle collisions during Operations are:

- Posting and enforcement of an 80 kilometre / hour speed limit during Operations; and
- As per the Ministry of Transportation's Brush Control Maintenance Quality Standard (MQS-324) and Grass Control Maintenance Quality Standard (MQS-326), mowing will be completed regularly to maintain vegetation at rest areas and within 185 metres of road signs and other objects that need to be seen (for example, guide rails) below 2 metres in height (Ministry of Transportation, 2003). The maintenance of low vegetation heights which will reduce chance of birds nesting in and crossing the Project right-of-way and rest areas.

Mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.4.4.10.3 Predicted Residual Effects

The implementation of mitigation is anticipated to limit Project-related changes to the survival and reproduction of birds from increased collision risk with vehicles and equipment. However, there is a predicted net effect from this interaction and, so, residual effects were carried forward into the residual effects characterization.

Effects from increased bird-vehicle collisions are predicted to be possible, irreversible (long term), continuous, and confined to the effects assessment Construction Disturbance Area. Effects from increased bird-vehicle collisions during operations are predicted to be possible, irreversible (long term), continuous, and confined to the effects

assessment Construction Disturbance Area. Effects from increased bird-vehicle collisions during Operations on the ability of the bird populations in the effects assessment Regional Study Area to remain self-sustaining and ecologically effective are anticipated to be negative but negligible in magnitude. As such, this Project–environment interaction is carried forward to cumulative effects.

9.4.4.4.11 Changes to Birds from Wildlife Attractants

9.4.4.4.11.1 Potential Effects

Survival and Reproduction

Some bird species may use permanent Project infrastructure (for example, bridges) as nesting habitat. The use of material stockpiles and infrastructure for nesting could result in inadvertent disturbance or destruction of bird nests by Project staff.

Raptors and other scavengers may be attracted to animals killed by collisions with vehicles (Forbes, 2009). Wildlife may also be attracted to roadside litter (Forbes, 2009). Attraction of carnivores and predatory birds (for example, ravens and gulls) to the Project during Operations can increase predation pressure on prey bird species and may cause local population declines for these species (Canadian Wildlife Service, 2007; Liebezeit et al., 2009).

9.4.4.4.11.2 Mitigation and Enhancement Measures

The mitigation measures established and refined using adaptive management during Project Construction should be maintained during Operations. The following mitigation will be implemented to deter birds from nesting on Project material stockpiles during Project Operations:

- The slopes of material stockpiles will be maintained at 70 degrees or less to deter bank swallow nesting;
- Hanging brightly coloured strips of fabric over slope faces to deter birds. These must be well secured and weighted at the bottom; and
- Placing geotextile, plastic covers, or tarping over slope faces or stockpiles to prevent access by birds. It is important to avoid using nets or other cover types that could entangle birds and cause potential injury or mortality.

If material stockpiles or Project infrastructure that may support nesting migratory birds need to be disturbed during the nesting season (April 28 to August 14; Environment and Climate Change Canada, 2023c), non-intrusive pre-clearing nest surveys will occur within seven days prior to maintenance activities beginning. If any areas are found to have birds

exhibiting breeding behaviour, these areas, including an activity disturbance buffer, will be flagged and protected from disturbance until the fledglings have left the nest.

During operation of the Project, inspections of the road and rest areas will occur two days of each week and, based on these inspections, debris and litter will be collected when detected (Ministry of Transportation, 2003). Additionally, as per the Ministry of Transportation's Debris Control Maintenance Quality Standard (MQS-331), debris less than 1 metres in diameter, including roadkill, will be removed within 48 hours; debris greater than 1 metres in diameter will be removed as detected (Ministry of Transportation, 2003). Generally, roadkill will be removed from the effects assessment Construction Disturbance Area and relocated to adjacent brush areas, as per the Waste and Excess Materials Management Environmental Protection (EP-9) requirements in the Ministry of Transportation's Maintenance Manual (Ministry of Transportation, 2003). As per the Waste and Excess Materials Management Environmental Protection requirements in the Maintenance Manual, depending on the location and weather at the time of roadkill removal, burial of small mammals occur in the roadside ditches, if this activity is permitted under a Certificate of Approval for Waste Management System (Ministry of Transportation, 2003).

Rest areas will be available every 50 kilometres along the road during Operations. The rest areas will be staggered every 25 kilometres, alternating on each side of the highway. These rest areas will contain waste receptacles. As per the Ministry of Transportation's Rest Area/Picnic Site Maintenance Best Practice (MBP-325), during the rest areas operating season (in other words, months during the year when temperatures remain above 0 degrees Celsius and closing no sooner than October 15), litter in waste receptacles will be removed from rest areas when waste receptacles are 75 percent full (Ministry of Transportation, 2003).

9.4.4.4.11.3 Predicted Residual Effects

Mitigation should limit wildlife attractants and attraction of birds and their predators to the Project. However, attraction to the Project could still occur. As such, this Project–environment interaction was predicted to have a net residual effect on bird populations and was carried forward into the residual effects characterization.

Effects are predicted to be possible, irreversible (long term) (for example, permanent aggregate piles and culverts), continuous, and confined to the effects assessment Construction Disturbance Area. Effects from wildlife attractants on the ability of the bird populations in the effects assessment Regional Study Area to remain self-sustaining and ecologically effective are anticipated to be negative but negligible in magnitude. As such, this Project–environment interaction is carried forward to cumulative effects.

9.4.4.4.12 Changes to Birds from Blasting and Flying Rock

9.4.4.4.12.1 Potential Effects

Explosives may be used at quarry sites to excavate materials to be used for maintenance of the Community Access Road. Blasting activities may produce fly rock that has the potential to strike birds in the vicinity and cause injury or death. The risk of mortality from being struck by fly rock would be greatest for birds who occupy territories that overlap blasting sites, or for birds that are flying over blasting sites when blasting occurs.

9.4.4.4.12.2 Mitigation and Enhancement Measures

Best management practices for blasting activities will include:

- Ontario Provincial Standard Specification – General Specification for the Use of Explosives (Ministry of Transportation, 2014);
- Ministry of Transportation Ontario Environmental Reference for Highway Design;
- Ontario Regulation 244/97 (*Aggregate Resources Act*);
- Ministry of Transportation Ontario Noise Protocol and Environmental Guide for Noise; and
- Department of Fisheries and Oceans Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters.

The mitigation measures established and refined using adaptive management during Project Construction for Blasting should be maintained during Maintenance. An environmental monitoring program will be implemented during Maintenance and will include policies and actions for avoiding and minimizing the risks of blasting and blasting materials to wildlife. During Operations, quarry blasting will be suspended within 10 kilometres of known or potential High Use Areas during the migratory bird breeding window of April 28 to August 14 (Environment and Climate Change Canada, 2023c). If adherence to the timing windows and restrictions is not possible, the Owner / Operator will develop site-specific mitigation and monitoring in consultation with appropriate regulatory agencies. This may include implementation of a buffer zone survey around the perimeter of blasting activities and surrounding forested habitat, whereby blasting will be prohibited if raptor stick nests are observed within 500 metres from the blasting location.

9.4.4.4.12.3 Predicted Residual Effects

Due to the infrequent timing of blasting, and with the implementation of mitigation, blasting and fly rock from the Project during Operations is not expected to result in injury or mortality to birds. There is no net effect predicted for this Project–environment

interaction on bird survival and reproduction. Therefore, this interaction was not carried forward in the assessment.

9.4.4.4.13 Changes to Birds from Chemical or Hazardous Material Spills

9.4.4.4.13.1 Potential Effects

Survival and Reproduction

There is the potential for accidental spills of fuels and other materials from malfunctions of equipment or spills during equipment or vehicle refuelling during maintenance activities or through fuel and hazardous material releases from vehicle collisions. Effects from spills on water, soil, and vegetation quality, and subsequent effects on bird survival and reproduction, during Operations are the same as discussed in the Construction section, above.

9.4.4.4.13.2 Mitigation and Enhancement Measures

The mitigation measures established and refined using adaptive management during Project Construction should be maintained during operations. During Operations, mitigation measures will include a posting and enforcement of a speed limit on the highway, which should reduce potential for chemical or hazardous material spills by reducing vehicle collision risk. It is anticipated that commercial vehicles that are transporting dangerous goods on the Community Access Road should be adhering to the federal *Transportation of Dangerous Goods Act* and Ontario's *Dangerous Goods Transportation Act*.

A comprehensive list of mitigation measures to limit changes to surface water and groundwater quality from spills during operations is provided in the Surface Water Technical Support Document (**Appendix F**) and Groundwater Technical Support Document (**Appendix H**). Mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.4.4.13.3 Predicted Residual Effects

As discussed in the Vegetation Technical Support Document (**Appendix J**) and the Peatlands Technical Support Document (**Appendix I**), Surface Water Technical Support Document (**Appendix F**) and Groundwater Technical Support Document (**Appendix H**), and Physiography, Terrain, and Soils Technical Support Document (**Appendix N**) there are predicted to be no residual effects from chemical or hazardous material spills on surface water quality, groundwater, soil, or vegetation quality during Operations. As such there was predicted to be no net effect on bird survival and reproduction, relative to existing conditions. Therefore, the potential effects of chemical or hazardous material spills were not carried forward in the assessment.

9.4.4.4.14 Changes to Individual Bird Species

Information on individual bird species assessed can be found in Birds Technical Support Document (**Appendix L**). The following bird species were assessed:

- Forest Birds: Red-eyed Vireo, Oven bird, Dark-eyed Junco
- Raptors: Osprey, Boreal Owl
- Shorebirds: Wilson's Snipe
- Waterfowl and Waterbirds: Mallard
- Bog / Fen Birds and Other Wetland Birds: Palm Warbler, Common Yellowthroat, Northern Waterthrush, Sora
- Species at Risk Birds: Canada Warbler, Evening Grosbeak, Chimney Swift, Bank Swallow, Barn Swallow, Common Nighthawk, Eastern Whip-poor-will, Eastern Wood-pewee, Olive-sided Flycatcher, Bald Eagle, Peregrine Falcon, Short-eared Owl, Black Tern, Lesser Yellowlegs, Rusty Blackbird, Yellow Rail

9.4.4.4.14.1 Potential Effects

Habitat Loss and Alteration

Although habitat will be initially removed during construction, the effects on habitat availability and survival and reproduction from habitat loss and alteration will continue through Operations of the Project (in other words, closure and reclamation of the road is not anticipated). Temporary features that are decommissioned and reclaimed or naturally revegetate after Construction is complete are anticipated to provide functional habitat for bird species 5 to 10 years after the establishment of vegetation and would likely reduce the residual effects on bird survival and reproduction caused by the Project.

Sensory Disturbance

Habitat Availability

During Operations, even though traffic levels will vary throughout the day, traffic is expected to use the Community Access Road throughout the day and night and traffic can be present along the full length of the Community Access Road at any given time.

Distribution

During Operations, there are predicted to be a maximum of 700 vehicles per day for the north-south section and 100 vehicles per day for the east-west section of the Community Access Road (**Appendix W**). Although there may be intervals between vehicles passing along one location on the Community Access Road, vehicles may be

using the road through the day and night and there may not be a substantial interval without sensory disturbance.

Survival and Reproduction

During Operations, noise is predicted to reach 50 A-weighted decibels at 100 metres from the edge of the effects assessment Construction Disturbance Area (Final Acoustic and Vibration Environment Technical Support Document [**Appendix P**]). Sensory disturbance can occur along the entire length of the Community Access Road and can occur at any time of day during Operations.

Increase in Edge Habitat

Survival and Reproduction

Although the removal of habitat and creation of edge habitat will initially occur during construction, effects will continue through Operations of the Project (in other words, closure and reclamation of the road is not anticipated). Temporary features that are decommissioned and reclaimed or naturally revegetate after Construction is complete are anticipated to provide functional habitat for bird within 60 to 80 years after the establishment of vegetation and would likely reduce the residual effects on bird species survival and reproduction caused by increased edge habitat created by the Project.

9.4.4.4.14.2 Mitigation and Enhancement Measures

Habitat Loss and Alteration

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources will be followed during Operations.

Sensory Disturbance

The following mitigation measures will be implemented to limit effects from sensory disturbance during Operations on birds:

- The migratory bird nesting season and timing of activities should be considered during operations;
- Complete maintenance work as quickly as possible to shorten the duration of disturbance;
- Posting and enforcement of speed limits to reduce vehicle speeds and associated noise and dust emission levels; and

- Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during operations.

Additionally, a Preliminary Biodiversity Offset Plan (**Appendix AB**) has been developed to achieve no net loss of bird habitat. Over the long term, measures undertaken as part of the Preliminary Biodiversity Offset Plan would be implemented to achieve a net increase in functional migratory bird habitat. However, because there is uncertainty in the effectiveness and timing of offset measures in the Preliminary Terrestrial Offset Biodiversity Plan, offsetting has not been considered in the conclusion of predicted residual effects below.

Increase in Edge Habitat

The effects assessment Construction Disturbance Area was designed to avoid removal of bird habitat and associated creation of edge habitat as much as practical, but a Preliminary Biodiversity Offset Plan (**Appendix AB**) has been developed to have no net loss of bird habitat.

Additional mitigation measures that will be implemented to limit effects from habitat loss and thereby effects from increased edge habitat on birds during Project Operations are discussed in **Section 9.4.4.4.14.**

9.4.4.4.14.3 Predicted Residual Effects

Habitat Loss and Alteration

Even after mitigation, potential bird habitat will be removed by the Project. Effects will occur in perpetuity (in other words, throughout Operations). The implementation of mitigation and enhancement measures is expected to limit negative effects. However, there are predicted net residual effects on bird habitat availability, distribution, and survival and reproduction during Operations.

Residual effects from habitat loss on the ability of bird population in the effects assessment Regional Study Area to remain self-sustaining and ecologically effective are anticipated to be negative but low in magnitude. As such, this Project–environment interaction is carried forward to cumulative effects. These predicted residual effects are applicable to Red-eyed Vireo, Ovenbird, Dark-eyed Junco, Osprey, Boreal Owl, Wilson’s Snipe, Mallard, Palm Warbler, Common Yellowthroat, Northern Waterthrush, Sora, Canada Warbler, Evening Grosbeak, Chimney Swift, Barn Swallow, Bank Swallow, Common Nighthawk, Eastern Whip-poor-will, Eastern Wood-Pewee, Olive-

sided Flycatcher, Bald Eagle, Peregrine Falcon, Short-eared Owl, Black Tern, Lesser Yellowlegs, Rusty Blackbird and Yellow Rail.

Sensory Disturbance

Even after implementation of mitigation, potential bird breeding habitat may be indirectly removed or degraded due to sensory disturbance during Operations of the Project. As such, there are predicted net residual effects on bird habitat availability, distribution, and survival and reproduction during Operations.

Residual effects from sensory disturbance on the ability of the bird population in the effects assessment Regional Study Area to remain self-sustaining and ecologically effective are anticipated to be negative but low in magnitude. As such, this Project–environment interaction is carried forward to cumulative effects. These predicted residual effects are applicable to Red-eyed Vireo, Ovenbird, Dark-eyed Junco, Osprey, Boreal Owl, Wilson's Snipe, Mallard, Palm Warbler, Common Yellowthroat, Northern Waterthrush, Sora, Canada Warbler, Evening Grosbeak, Chimney Swift, Barn Swallow, Bank Swallow, Common Nighthawk, Eastern Whip-poor-will, Eastern Wood-Pewee, Olive-sided Flycatcher, Bald Eagle, Peregrine Falcon, Short-eared Owl, Black Tern, Lesser Yellowlegs, Rusty Blackbird and Yellow Rail.

Increase in Edge Habitat

Increased predation risk will occur throughout the Operations Phase. The implementation of mitigation and enhancement measures is expected to limit negative effects but there is a predicted net residual effect on bird survival and reproduction.

Residual effects from increased edge habitat on the ability of the bird population in the effects assessment Regional Study Area to remain self-sustaining and ecologically effective are anticipated to be negative but low in magnitude. As such, this Project–environment interaction is carried forward to cumulative effects. These predicted residual effects are applied to Red-eyed Vireo, Ovenbird, Palm Warbler, Northern Waterthrush, Common Nighthawk, Eastern Whip-poor-will and Short-eared Owl.

9.4.4.5 Summary of Residual Effects

Table 9.4-12 provides a summary of the potential effects for birds, mitigation measures, and residual effects. Detailed information is included in **Appendix L**.

Table 9.4-12: Summary of Residual Effects for Birds and Characterization

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
• **All Birds**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Introduction and spread of invasive plant species—can affect plant community composition, which can affect bird habitat availability and distribution	• A comprehensive list of mitigation measures to control invasive plant species during construction is provided in the Vegetation Technical Support Document (**Appendix J**) and Peatlands Technical Support Document (**Appendix I**). • Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction.	• Residual changes in bird habitat availability and distribution due to introduction and spread of invasive plant species.	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration / Reversibility: Short term / Reversable • Frequency: Infrequent • Likelihood: Possible • Significance: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect
• **All Birds**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Introduction and spread of invasive plant species—can affect plant community composition, which can affect bird habitat availability and distribution	• A comprehensive list of mitigation measures to control invasive plant species during Operations is provided in the Vegetation Technical Support Document (**Appendix J**) and Peatlands Technical Support Document (**Appendix I**). • Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during Operations.	• Residual changes in bird habitat availability and distribution due to introduction and spread of invasive plant species.	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration / Reversibility: Long term / Reversable • Frequency: Infrequent • Likelihood: Possible • Significance: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect
• **All Birds**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls)	• Construction	• Emissions of criteria air contaminants—Deposition of particulates in criteria air contaminant emissions (for example, potential acid inputs) may change soil quality and vegetation and affect bird habitat availability and distribution.	• A comprehensive list of mitigation measures that will be implemented to limit air particulate emissions during construction is provided in the Atmospheric Environment Technical Support Document (**Appendix S**).	• No residual effects anticipated	• No residual effects anticipated

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
	• Temporary concrete batch plants • Pits and quarries • Drilling / blasting / aggregate production • Construction site restoration • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas					
• **All Birds**	• Pits and quarries • Drilling / blasting / aggregate production • Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Emissions of criteria air contaminants—Deposition of particulates in criteria air contaminant emissions (for example, potential acid inputs) may change soil quality and vegetation and affect bird habitat availability and distribution.	• A comprehensive list of mitigation measures that will be implemented to limit air particulate emissions during Operations is provided in the Atmospheric Environment Technical Support Document (**Appendix S**).	• No residual effects anticipated	• No residual effects anticipated
• **All Birds**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Temporary concrete batch plants • Pits and quarries • Drilling / blasting / aggregate production • Construction site restoration • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Fugitive dust emissions—Deposition of dust particulates may change soil and vegetation quality and affect bird habitat availability and distribution.	• A comprehensive list of mitigation measures that will be implemented to limit dust deposition during construction is provided in the Atmospheric Environment Technical Support Document (**Appendix S**).	• Residual changes to bird habitat availability and distribution from dust emissions and deposition	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration / Reversibility: Medium term / Reversable • Frequency: Continuous • Likelihood: Certain • Significance: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
• **All Birds**	• Pits and quarries • Drilling / blasting / aggregate production • Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Fugitive dust emissions—Deposition of dust particulates may change soil and vegetation quality and affect bird habitat availability and distribution.	• A comprehensive list of mitigation measures that will be implemented to limit dust deposition during Operations is provided in the Atmospheric Environment Technical Support Document (**Appendix S**).	• Residual changes to bird habitat availability and distribution from dust emissions and deposition	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration / Reversibility: Long term / Reversable • Frequency: Continuous • Likelihood: Certain • Significance: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect
• **All Birds**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Temporary concrete batch plants • Pits and quarries • Drilling / blasting / aggregate production • Construction site restoration • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Erosion and sedimentation—can alter surface water, groundwater, soil, and vegetation quality and affect bird habitat availability and distribution.	• A comprehensive list of mitigation measures to limit changes to erosion and sedimentation during construction is provided in the Surface Water Technical Support Document (**Appendix F**). • Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction.	• No residual effects anticipated	• No residual effects anticipated
• **All Birds**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Erosion and sedimentation—can alter surface water, groundwater, soil, and vegetation quality and affect bird habitat availability and distribution.	• A comprehensive list of mitigation measures to limit changes to erosion and sedimentation during construction is provided in the Surface Water Technical Support Document (**Appendix F**). • Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during Operations.	• No residual effects anticipated	• No residual effects anticipated

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
• **All Birds**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Pits and quarries • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Temporary concrete batch plants • Pits and quarries • Drilling / blasting / aggregate production • Construction site restoration • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Changes to surface water quantity—alteration of surface water drainage patterns, flows, and levels that can cause changes to soils and vegetation, which can affect bird habitat availability and distribution.	• Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction. • A comprehensive list of mitigation measures to limit changes to surface water quantity during construction is provided in the Surface Water Technical Support Document (**Appendix F**).	• No residual effects anticipated	• No residual effects anticipated
• **All Birds**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Changes to surface water quantity—alteration of surface water drainage patterns, flows, and levels that can cause changes to soils and vegetation, which can affect bird habitat availability and distribution.	• Follow Ontario Provincial Standard Specification 411 and regularly inspect and maintain culverts and bridges (Ministry of Transportation, 2022c). • Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during Operations. • A comprehensive list of mitigation measures to limit changes to surface water quantity during construction is provided in the Surface Water Technical Support Document (**Appendix F**).	• No residual effects anticipated	• No residual effects anticipated

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
• **All Birds**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Pits and quarries • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls)	• Construction	• Surface water quality—changes in surface water quality from Project activities could adversely affect bird habitat availability and distribution.	• A comprehensive list of mitigation measures to limit changes to surface water quality during construction is provided in the Surface Water Technical Support Document (**Appendix F**). • Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction.	• No residual effects anticipated	• No residual effects anticipated
• **All Birds**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Surface water quality—changes in surface water quality from Project activities could adversely affect bird habitat availability and distribution.	• A comprehensive list of mitigation measures to limit changes to surface water quality during Operations is provided in the Surface Water Technical Support Document (**Appendix F**). • Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during Operations.	• No residual effects anticipated	• No residual effects anticipated
• **All Birds**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Pits and quarries • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Temporary concrete batch plants • Pits and quarries • Drilling / blasting / aggregate production • Construction site restoration • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Changes to groundwater—alteration of groundwater drainage and infiltration patterns, flows, and levels that can cause changes to soils and vegetation, which can affect bird habitat availability and distribution.	• A comprehensive list of mitigation measures to limit changes to groundwater quantity during construction is provided in the Groundwater Technical Support Document (**Appendix H**). • Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction.	• Residual changes to bird habitat availability and distribution from changes to groundwater quantity.	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Probable • Significance: Not Significant • Uncertainty: Moderate • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
• **All Birds**	• Pits and quarries • Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Changes to groundwater—alteration of groundwater drainage and infiltration patterns, flows, and levels that can cause changes to soils and vegetation, which can affect bird habitat availability and distribution.	• A comprehensive list of mitigation measures to limit changes to groundwater quantity during Operations is provided in the Groundwater Technical Support Document (**Appendix H**). • The groundwater monitoring program is described in more detail in the Peatlands Technical Support Document (**Appendix I**). • Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during Operations.	• Residual changes to bird habitat availability and distribution from changes to groundwater quantity.	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Probable • Significance: Not Significant • Uncertainty: Moderate • Direct / Indirect: Indirect
• **All Birds**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Temporary concrete batch plants • Pits and quarries • Drilling / blasting / aggregate production • Construction site restoration • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Increase in public access—could affect bird survival and reproduction through legal and illegal hunting.	• Restrict access to the effects assessment Construction Disturbance Area to construction personnel and prohibit firearms.	• Residual changes to bird survival and reproduction from increased public access	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Regional • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Unlikely • Significance: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect
• **All Birds**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Increase in public access—could affect bird survival and reproduction through legal and illegal hunting.	• Potential changes in hunter and angler pressure, and fish and bird harvest during Operations will continue to be managed by Environment and Climate Change Canada, Ministry of Natural Resources, and Fisheries and Oceans Canada.	• Residual changes to bird survival and reproduction from increased public access	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Regional • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Possible • Significance: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
• **All Birds**	• Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Pits and quarries • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Incidental take—vegetation removal and soil alterations during site preparation for construction activities, vegetation maintenance activities during Operations may result in destruction of nests, eggs, and individuals of birds.	• Follow guidance as outlined in Environment and Climate Change Canada's Avoidance Guidelines for Migratory Birds. • Vegetation clearing activities will occur between August 15 and April 27 (outside of the migratory bird nesting season for nesting zones C5 and C6), as much as possible. • Non-intrusive pre-clearing nest surveys to look for migratory bird nests will be completed if any vegetation clearing is required during the migratory bird nesting season (April 28 to August 14). Pre-clearing nest surveys will follow guidance outlined in **Appendix L**. • Wildlife sweeps to look for pileated woodpecker nests and raptor stick nests will be completed prior to vegetation clearing at any time of the year.	• Residual changes to bird survival and reproduction from incidental take	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration / Reversibility: Medium term / Reversible • Frequency: Frequent • Likelihood: Possible • Significance: Not Significant • Uncertainty: Moderate • Direct / Indirect: Indirect
• **All Birds**	• Pits and quarries • Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Incidental take—vegetation removal and soil alterations during site preparation for construction activities, vegetation maintenance activities during Operations may result in destruction of nests, eggs, and individuals of birds	• As per the Ministry of Transportation's Environmental Protection for Migratory Birds (EP-4), bridges and culverts will be inspected for the presence of nests and / or birds prior to maintenance activities taking place.	• Residual changes to bird survival and reproduction from incidental take	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration / Reversibility: Long term / Irreversible • Frequency: Infrequent • Likelihood: Possible • Significance: Not Significant • Uncertainty: Moderate • Direct / Indirect: Indirect
• **All Birds**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Pits and quarries • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls)	• Construction	• Collisions with vehicles and equipment—may cause injury or mortality to individual birds.	• Restricting access to the Project to construction personnel during construction. • Providing wildlife awareness training for road construction workers to reduce vehicle speeds.	• Residual changes to bird survival and reproduction from collisions with vehicles and equipment	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration / Reversibility: Medium term / Reversible • Frequency: Frequent • Likelihood: Possible • Significance: Not Significant • Uncertainty: Moderate • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
• **All Birds**	• Pits and quarries • Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Collisions with vehicles and equipment—may cause injury or mortality to individual birds.	• Posting and enforcement of an 80 kilometre per hour speed limit during Operations.	• Residual changes to bird survival and reproduction from collisions with vehicles and equipment	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Possible • Significance: Not Significant • Uncertainty: Moderate • Direct / Indirect: Indirect
• **All Birds**	• Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Pits and quarries • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls)	• Construction	• Wildlife attractants—attraction of wildlife to the Project site can affect bird survival and reproduction through increased mortality risk and changes to predator-prey relationships.	• Keeping building and storage container doors closed. • The slopes of material stockpiles will be maintained at 70 degrees or less to deter bank swallow nesting.	• Residual changes to bird survival and reproduction from wildlife attractants	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Possible • Significance: Not Significant • Uncertainty: Moderate • Direct / Indirect: Indirect
• **All Birds**	• Pits and quarries • Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Wildlife attractants—attraction of wildlife to the Project site can affect bird survival and reproduction through increased mortality risk and changes to predator-prey relationships.	• Roadkill, debris, and waste management as per Ministry of Transportation's Debris Control Maintenance Quality Standard (MQS-331) and Ministry of Transportation's Rest Area / Picnic Site Maintenance Best Practice (MBP-325). • The slopes of material stockpiles will be maintained at 70 degrees or less to deter bank swallow nesting.	• Residual changes to bird survival and reproduction from wildlife attractants	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Possible • Significance: Not Significant • Uncertainty: Moderate • Direct / Indirect: Indirect
• **All Birds**	• Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Pits and quarries • Drilling / blasting / aggregate production	• Construction	• Blasting and fly rock—may result in injury or mortality to birds.	• An Environmental Protection Plan will be implemented that includes policies and actions for avoiding and minimizing the risks of blasting and blasting materials to wildlife, including birds.	• No residual effect anticipated	• No residual effect anticipated

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
• **All Birds**	• Pits and quarries • Maintain the Preferred Route	• Operations	• Blasting and fly rock—may result in injury or mortality to birds.	• An Environmental Protection Plan will be implemented that includes policies and actions for avoiding and minimizing the risks of blasting and blasting materials to wildlife, including birds.	• No residual effect anticipated	• No residual effect anticipated
• **All Birds**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Pits and quarries • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Chemical or hazardous material spills—(for example, petroleum products) can affect soil quality, ecosystems, and, ultimately, the health of birds.	• Adhere to federal and provincial regulations and guidelines regarding hazardous substance collection and storage, use and handling, and disposal and treatment, such as the federal *Transportation of Dangerous Goods Act* (Government of Canada, 1992), Ontario *Dangerous Goods Transportation Act* (Government of Ontario, 1990j), and the Ontario *Environmental Protection Act* (Government of Ontario, 1990e). • Providing training for road construction workers to reduce vehicle speeds.	• No residual effect anticipated	• No residual effect anticipated
• **All Birds**	• Pits and quarries • Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Chemical or hazardous material spills—(for example, petroleum products) can affect soil quality, ecosystems, and, ultimately, the health of birds.	• Adhere to federal and provincial regulations and guidelines regarding hazardous substance collection and storage, use and handling, and disposal and treatment, such as the *Transportation of Dangerous Goods Act* (Government of Canada, 1992), Dangerous Goods Handling and Transportation Act (Government of Ontario, 1990j), and the *Environmental Protection Act* (Government of Ontario, 1990e). • Posting and enforcement of an 80 kilometre per hour speed limit during Operations.	• No residual effect anticipated	• No residual effect anticipated
• **Individual Bird Species**	• The Birds Technical Support Document (**Appendix L**) contains details regarding potential effects, mitigation and enhancement measures and predicted residual effects on individual bird species.	• -	• -	• -	• -	• -

9.4.5 Ungulates

9.4.5.1 Project-Environment Interactions

As a component of the effects assessment, the Project activities were reviewed to find potential environmental interactions. These interactions were then assessed for potential effect (**Table 9.4-13**).

Table 9.4-13: Project-Environment Interactions – Ungulates

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• **Construction**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Pits and quarries • Temporary concrete batch plants • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* Decommissioning of temporary camps, roads / trails and staging areas	• Boreal Caribou and Moose	• Habitat availability • Habitat distribution	• Introduction and spread of invasive plant species—Introduction of invasive plants from Project activities can affect plant community composition, which can affect ungulate habitat availability and distribution. • Emissions of criteria air contaminants—Deposition of criteria air contaminant emissions (for example potential acid inputs) may change soil quality and vegetation and affect ungulate habitat availability and distribution. • Fugitive dust emissions—Deposition of dust particulates may change soil and vegetation quality and affect ungulate habitat availability and distribution. • Erosion and sedimentation—Vegetation clearing, earth moving, pit and quarry development and other Project activities can result in the release of sediment, which may change the composition and function of vegetation communities and affect ungulate habitat availability and distribution. • Changes in surface water quantity—Alteration of surface water drainage patterns, flows and levels that can cause changes to soils and vegetation, which can affect ungulate habitat availability and distribution. • Changes in surface water quality—Changes in surface water quality from Project activities could adversely affect habitat availability and distribution. • Changes to groundwater—Alteration of groundwater drainage and infiltration patterns, flows, and levels that can cause changes to soils and vegetation, which can affect ungulate habitat availability and distribution.
• **Construction**	• Same as previous	• Boreal Caribou and Moose	• Survival and reproduction	• Wildlife attractants—Attraction of wildlife to the Project site (for example food waste, sewage, petroleum-based products, dust suppressants, explosive powder, site runoff ponds) may increase human-wildlife interactions and change predator-prey relationships, which can affect animal survival and reproduction. • Blasting and associated fly rock—May result in injury or mortality to wildlife. • Chemical or hazardous material stored on the Project site, or spills—(for example petroleum products, ammonium nitrate) on site or along access or haul roads can affect wildlife survival and reproduction. • Increased predator access—Increased access for predators (for example wolf and black bear) and prey may increase predation risk and decrease survival and reproduction for moose and caribou. • Increase in public access—Could affect ungulate survival and reproduction through legal and illegal hunting. • Collision with vehicles and equipment—Vehicle or heavy equipment use may cause injury or mortality to individual caribou and moose.
• **Construction**	• Same as previous	• Boreal Caribou and Moose	• Habitat availability • Habitat distribution • Survival and reproduction	• Habitat loss—The direct removal or alteration of soil and vegetation that may change habitat availability, use, and connectivity and influence ungulate abundance and distribution. • Habitat alteration—Alteration of final terrain and soil conditions, and / or plant species composition, could change the types of ecosystems that can be reclaimed on the landscape and adversely affect ungulate habitat availability and distribution, and survival and reproduction. • Sensory disturbance—(for example lights, smells, noise, human activity) can alter ungulate habitat availability, use and connectivity (movement and behaviour), which can lead to changes in abundance and distribution and adversely affect survival and reproduction. • Linear barriers—Roads and snowbanks on roads could decrease habitat connectivity and adversely affect ungulate distribution, which can lead to changes in abundance and distribution and adversely affect survival and reproduction.

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• **Operations**	• Operate the Community Access Road • Maintain the Community Access Road	• Boreal Caribou and Moose	• Habitat availability • Habitat distribution	• Introduction and spread of invasive plant species—Can affect plant community composition, which can affect ungulate habitat availability and distribution. • Emissions of criteria air contaminants—Deposition of criteria air contaminant emissions (for example potential acid inputs) may change soil quality and vegetation and affect ungulate habitat availability and distribution. • Fugitive dust emissions—Deposition of dust particulates may change soil and vegetation quality and affect ungulate habitat availability and distribution. • Erosion and sedimentation—Vegetation clearing, earth moving, pit and quarry development and other Project activities can result in the release of sediment, which may change the composition and function of vegetation communities and affect ungulate habitat availability and distribution. • Changes in surface water quantity—Alteration of drainage patterns and increased / decreased drainage flows, and surface water levels can cause changes to soils and vegetation, which can affect ungulate habitat availability. • Changes in surface water quality—Changes in surface water quality from Project activities could adversely affect habitat availability and distribution. • Changes to groundwater—Alteration of groundwater drainage and infiltration patterns, flows, and levels that can cause changes to soils and vegetation, which can affect ungulate habitat availability and distribution.
• **Operations**	• Operate the Community Access Road • Maintain the Community Access Road	• Boreal Caribou and Moose	• Survival and reproduction	• Wildlife attractants—Attraction of wildlife to the Project site (for example food waste, sewage, petroleum-based products, dust suppressants, explosive powder, site runoff ponds) may increase human-wildlife interactions and change predator-prey relationships, which can affect animal survival and reproduction. • Blasting and associated fly rock—May result in injury or mortality to wildlife. • Chemical or hazardous material stored on the Project site, or spills—(for example petroleum products, ammonium nitrate) on site or along access or haul roads can affect wildlife survival and reproduction. • Increased predator access—Increased access for predators (for example wolf and black bear) and prey may increase predation risk and decrease survival and reproduction for moose and caribou. • Increase in public access—Could affect ungulate survival and reproduction through legal and illegal hunting. • Collision with vehicles and equipment—Vehicle or heavy equipment use may cause injury or mortality to individual caribou and moose.
• **Operations**	• Operate the Community Access Road • Maintain the Community Access Road	• Boreal Caribou and Moose	• Habitat availability • Habitat distribution • Survival and reproduction	• Habitat loss—The direct removal or alteration of soil and vegetation that may change habitat availability, use, and connectivity and influence ungulate abundance and distribution. • Habitat alteration—Alteration of final terrain and soil conditions, and / or plant species composition, could change the types of ecosystems that can be reclaimed on the landscape and adversely affect ungulate habitat availability and distribution, and survival and reproduction. • Sensory disturbance—(for example lights, smells, noise, human activity) can alter ungulate habitat availability, use and connectivity (movement and behaviour), which can lead to changes in abundance and distribution and adversely affect survival and reproduction. • Linear barriers—Roads and snowbanks on roads could decrease habitat connectivity and adversely affect ungulate distribution, which can lead to changes in abundance and distribution and adversely affect survival and reproduction.

9.4.5.2 Discipline-Specific Characteristics

In support of the residual effects characteristics described in **Section 6.7.3**, **Table 6-1**, the following ungulates definitions apply to the effects assessment.

Ecological and Social Context

Context for ungulate valued components considers species sensitivity, resilience, adaptive capacity, current status and trends, and applicable legislation and best management practices. The current and future sensitivity and resilience of ungulate valued components to change caused by the Project are considered and includes Indigenous Knowledge, where available. Consideration of ecological context includes timing, such as when the effect could occur during a critical life cycle of the valued component. Context also informs whether the residual effect would alter the ability of the valued component ungulate populations to be self-sustaining and ecologically effective (in other words, the determination of significance). Ecological context is discussed in a reasoned narrative with other characteristics such as magnitude, geographic extent, duration, reversibility, and likelihood used to characterize residual effects and determine significance.

The Boreal population and Eastern Migratory population of caribou interact year-round and in winter, respectively, with the Ungulates effects assessment Local Study Area and Caribou effects assessment Regional Study Area. The four provincially delineated ranges that make up the caribou effects assessment Regional Study Area are Missisa, Nipigon, Ozhiski, and Pagwachuan, each of which are fully encompassed in the caribou effects assessment Regional Study Area.

The provincial status of Eastern Migratory caribou as Special Concern and lack of federal status on Schedule 1 of SARA means they are not given species or habitat protection, nor is there any provincial General Habitat Description or federal critical habitat defined for the species. Similar to boreal caribou, a major threat to Eastern migratory caribou is sensitivity to industrial disturbance and development, including road networks that are known to facilitate increased harvest because of improved access (Committee on the Status of Species at Risk in Ontario, 2017). Given their spatial overlap and shared habitat and food resources during winter, it is reasonable to assume that Eastern migratory caribou would experience the same predicted effects as boreal caribou when they occur in the Ungulate study areas and mitigation measures applied to boreal caribou would protect all “caribou”. As such, the boreal caribou ecotype was selected to act as a proxy for all caribou for the purposes of this assessment (and hereafter referred to as caribou, unless specifically noted).

Magnitude

Magnitude refers to the amount of change in an indicator relative to the existing conditions of a valued component and / or to known thresholds, standards, or guidelines. Magnitude is categorized as negligible, low, moderate, or high using numeric quantification or qualitative expression and supported by the literature through a reasoned narrative. Integrating ecological context to understand the point at which a given magnitude is large enough to be critical for a valued component is directly linked to the self-sustaining and ecologically effective status of the population, and therefore directly linked to significance.

9.4.5.3 Residual Effects – Construction Phase

9.4.5.3.1 Changes to Boreal Caribou and Moose from Introduction and Spread of Invasive Plant Species

9.4.5.3.1.1 Potential Effects

Habitat Availability and Distribution

The introduction and spread of invasive plant species have the potential to alter and degrade habitats relied upon by ungulates, particularly in areas with disturbed soil or located adjacent to the new disturbance (in other words, edge habitats). The introduction of invasive plant species into new areas can reduce the quality of ungulate habitats by altering species diversity and the community plant structure through competition with native species, and by changing soil conditions (for example, nutrients, moisture; Mack et al., 2000; Carlson and Shepherd, 2007). Land clearing during construction in the effects assessment Construction Disturbance Area will remove vegetation and disturb soils, increasing the potential for invasive plant species to establish and spread along the right-of-way and other areas of edge habitats in the ungulate effects assessment Local Study Area.

The regular transport of vehicles, equipment and personnel during the Construction of the Project could transport invasive plant seeds or plant parts into new areas inside and adjacent to the effects assessment Construction Disturbance Area.

9.4.5.3.1.2 Mitigation and Enhancement Measures

Habitat Availability and Distribution

A Project-specific environmental monitoring program will be developed and will contain mitigation measures to control invasive plant species. Herbicides (and pesticides) will not be used during construction. Environmental approval conditions, permits, or

authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction.

A list of mitigation measures to control invasive plants during construction is provided in the Vegetation Technical Support Document (**Appendix J**) and the Peatlands Technical Support Document (**Appendix I).** Mitigation measures to limit the introduction and spread of invasive plants are well understood and the methods have been demonstrated to be effective. The effectiveness of mitigation measures will be evaluated during construction and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.5.3.1.3 Predicted Residual Effects

During construction, invasive species may occasionally be introduced within the effects assessment Construction Disturbance Area. Best management practices and the mitigation measures for controlling the spread of invasive species that will be implemented during construction are well understood and the methods have been demonstrated to be effective. However, introduction of invasive plants could still occur during construction, even following mitigation. As such, the Project is predicted to have a net residual effect on ungulate habitat availability and distribution from the potential introduction of invasive plants during construction and this interaction was carried forward to the residual effects characterization.

Should invasive plants be introduced from Construction vehicles, the plants will be contained and removed quickly resulting in a small, localized effect in the Construction Disturbance Area that is reversible in the short-term and therefore the effect is not predicted to reduce or degrade wildlife habitat. During construction, effects are possible and infrequent. Effects from the introduction of invasive plants on the ability of caribou and moose populations in the respective effects assessment Regional Study Areas to remain self-sustaining and ecologically functional are anticipated to be negative and negligible in magnitude.

9.4.5.3.2 Changes to Boreal Caribou and Moose from Emissions of Criteria Air Contaminants

9.4.5.3.2.1 Potential Effects

Habitat Availability and Distribution

The construction of the Project is expected to generate air particulate emissions, including carbon monoxide, sulphur oxides (including sulphur dioxide), nitrogen oxides, and other particulate matter. Activities during construction are expected to produce most

of the air emissions that would be attributable to the Project from the use of fossil fuels in construction vehicles, motorized equipment, machinery, power generators (to be used at temporary construction camps and temporary aggregate areas), the use of explosives (blasting), and the burning of non-hazardous waste materials (for example, food garbage at temporary construction camps). Indigenous communities including Fort Albany First Nation have shared concerns in relation to the emissions of criteria air contaminants, including how the Project might contribute to resource exploitation, leading to further air pollution and contamination for larger game such as moose and caribou (Firelight Research Inc., 2024).

The deposition of air particulate emissions can result in changes to soil and surface water quality, which has the potential to alter plant community structure, composition and diversity by modifying the pH, nutrient content and living organisms in the soil. Contamination of water, soil and vegetation quality from deposition of Project air emissions during construction has the potential to negatively affect ungulates if it reduces the quality of suitable forage and habitat in the ungulate effects assessment Local Study Area, which could ultimately affect the distribution of ungulate populations.

9.4.5.3.2.2 Mitigation and Enhancement Measures

Habitat Availability and Distribution

Potential mitigation measures outlined in the Ontario Ministry of Transportation Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions for Provincial Transportation Projects (Ontario Ministry of Transportation, 2020) may be implemented, if feasible. A Project-specific environmental monitoring program will be developed and will contain mitigation measures to control dust and air emissions during construction. Mitigation measures to limit emissions of criteria air contaminants are well understood, and the methods have been demonstrated to be effective.

Environmental approval conditions, permits, or authorizations issued for the Project construction, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction.

A comprehensive list of mitigation measures that will be implemented to limit air particulate emissions during construction is provided in the Atmospheric Environment Technical Support Document - Volume 1: Air Quality (**Appendix S**).

9.4.5.3.2.3 Predicted Residual Effects

As discussed in the Vegetation Technical Support Document (**Appendix J**) and the Peatlands Technical Support Document (**Appendix I**), emissions of criteria air contaminants are anticipated to have negligible, possible effects on vegetation ecosystems, and, ultimately, ungulate habitat. As such, this interaction was determined to have no residual effects on ungulate habitat availability and distribution and is not carried forward in the assessment.

9.4.5.3.3 Changes to Boreal Caribou and Moose from Fugitive Dust Emissions

9.4.5.3.3.1 Potential Effects

Habitat Availability and Distribution

Fugitive dust emissions were a concern that was highlighted by Indigenous communities including Marten Falls First Nation and Weenusk First Nation (Marten Falls First Nation, 2023; MNP LPP, 2024b). Fugitive dust emissions are expected to be produced by the Project during construction activities such as land clearing, blasting, and infrastructure implementation (Atmospheric Environment Technical Support Document - Volume 1: Air Quality; **Appendix S**). Accumulation of airborne dust produced from the Project may result in local and direct changes to vegetation (Vegetation Technical Support Document [WSP, 2026b]). As a result, dust generated by the Project could adversely affect ungulates by degrading habitat quality and forage availability.

9.4.5.3.3.2 Mitigation and Enhancement Measures

Habitat Availability and Distribution

Dust deposition will be minimized during construction by following best industry practices and adhering to relevant government threshold values for deposition of acidifying compounds on specific plant species. Potential mitigation measures outlined in the Ontario Ministry of Transportation Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions for Provincial Transportation Projects (Ontario Ministry of Transportation, 2020) may be implemented, if feasible.

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction.

A Project-specific environmental monitoring program will be developed and will contain mitigation measures to control dust and air emissions during construction. A list of mitigation measures that will be implemented to limit dust deposition during construction is provided in the Atmospheric Environment Technical Support Document - Volume 1: Air Quality (**Appendix S**). Mitigation measures to limit dust deposition are well understood, and the methods have been demonstrated to be effective. The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.5.3.3.3 Predicted Residual Effects

Effects on caribou and moose habitat availability and distribution from fugitive dust emissions are predicted to be larger during operations than during construction because mitigations to limit dust emissions are predicted to be more effective during construction than during operations.

Dust deposition is predicted to result in negligible but certain changes to vegetation quality in the effects assessment Local Study Area (Vegetation Technical Support Document [**Appendix J**]; Peatlands Technical Support Document [**Appendix I**]). As such, there is a predicted net residual effect on caribou and moose habitat availability and distribution as a result of construction. The residual effects from fugitive dust emissions were carried forward into the residual effects assessment characterization.

Effects from dust emissions during construction are predicted to be certain, irreversible, continuous, and confined to the ungulate effects assessment Local Study Area. Effects from dust emissions on the ability of the ungulate populations in the caribou and moose effects assessment Regional Study Areas to remain self-sustaining and ecologically functional are anticipated to be negative and negligible in magnitude.

9.4.5.3.4 Changes to Boreal Caribou and Moose from Erosion and Sedimentation

9.4.5.3.4.1 Potential Effects

Habitat Availability and Distribution

Project Construction activities such as watercourse crossings, vegetation clearing, earth moving, pit and quarry development and other construction activities can result in exposure of vulnerable banks or slopes resulting in increased release of sediment. Sediment release into adjacent retained natural areas can have an effect on the composition and function of vegetation communities (Vegetation Technical Support Document [**Appendix J**]). These changes can reduce or degrade ungulate habitat

through localized changes in ecosystem composition, particularly wetland and riparian areas. The effects on vegetation would be expected to be localized and occur intermittently during construction but could include vegetation smothering and changes to drainage patterns and infiltration in the area of sediment deposits.

9.4.5.3.4.2 Mitigation and Enhancement Measures

Habitat Availability and Distribution

An environmental monitoring program will be developed and implemented during construction and will contain mitigation measures to control erosion and sedimentation. Erosion and sediment control measures will be developed and implemented in accordance with Ontario Provincial Standard Specifications for erosion and sediment control measures (Ministry of Transportation, 2021a, 2021c). Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction.

A list of mitigation measures that will be implemented during construction is provided in Vegetation Technical Support Document (**Appendix J**) and Surface Water Technical Support Document (**Appendix F**). These measures will be implemented to minimize effects from changes to erosion and sedimentation in the ungulate effects assessment Local Study Area during construction.

Mitigation measures to limit erosion and sedimentation are well understood and the methods have been demonstrated to be effective. The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.5.3.4.3 Predicted Residual Effects

Construction of the Project could result in localized increase in erosion-sedimentation processes at locations upstream or downstream of watercourse crossings and at receiving waterbodies. Environmental protection and monitoring plans developed for the Project Construction are expected to limit erosion and sedimentation. After implementing mitigation, the Project is not predicted to result in residual effects on the condition of peatland, upland, wetland and riparian ecosystems (in other words, ungulate habitat), relative to existing conditions (Vegetation Technical Support Document [WSP, 2026b]). As such, this interaction was not carried forward in the assessment.

9.4.5.3.5 Changes to Boreal Caribou and Moose from Changes in Surface Water Quantity

9.4.5.3.5.1 Potential Effects

Habitat Availability and Distribution

Project Construction activities such as constructing watercourse crossings, vegetation clearing, short-term water takings and discharge of construction water can cause changes to stream flows and / or water levels and erosion–sedimentation processes within or immediately upstream and downstream of the work area. Changes in the volume or rate of surface water flows during construction of the Project may adversely affect soils and peatland, wetland and riparian ecosystems through desiccation or inundation. Peatland, wetland and riparian ecosystems experience water level fluctuations as part of natural variability, and riparian ecosystems can recover relatively quickly from flooding.

Fluctuating surface water levels typically influence plant species composition, community structure, and species richness, and preventing changes in wetland water levels can cause a decrease in aquatic plant community diversity. Alternatively, changes in the amplitude, frequency, and timing of flood or drought compared to historical levels can cause adverse effects on wetlands, riparian areas and peatlands (Vegetation Technical Support Document [**Appendix J**]). These changes can reduce or degrade ungulate habitat through localized changes in ecosystem composition, particularly wetland and riparian areas.

9.4.5.3.5.2 Mitigation and Enhancement Measures

Habitat Availability and Distribution

Environmental approval conditions, permits, or authorizations issued for the Project will be followed, including those issued from Environment and Climate Change Canada, Fisheries and Oceans Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario.

A list of mitigation measures to limit changes to surface water quantity during construction is provided in the Surface Water Technical Support Document (**Appendix F**). This includes maintaining buffer zones of 30 metres around waterbodies. Mitigation measures to limit changes to surface water quantity are well understood and the methods have been demonstrated to be effective. The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.5.3.5.3 Predicted Residual Effects

As discussed in the Surface Water Technical Support Document (**Appendix F**), Construction of the Project could result in small, localized changes to surface water quantity. After implementing mitigation, changes to surface water quantity are anticipated to be of negligible magnitude. As such, no net residual effects on caribou and moose habitat availability and distribution are predicted and this interaction was not carried forward in the assessment.

9.4.5.3.6 Changes to Boreal Caribou and Moose from Changes in Surface Water Quality

9.4.5.3.6.1 Potential Effects

Habitat Availability and Distribution

During construction, surface water may become contaminated if chemicals or substances (for example, petroleum products, sediments, and garbage) from Project equipment, vehicles, road surfaces, or blasting sites are transported into surface water during precipitation events (Surface Water Technical Support Document; **Appendix F**). This includes contamination of surface water from accidental spills and leaks of chemicals and hazardous materials and wash-off of organic debris during vegetation maintenance activities. Changes to surface water quality could have negative effects on ungulates by reducing habitat availability and distribution.

9.4.5.3.6.2 Mitigation and Enhancement Measures

Habitat Availability and Distribution

Mitigation measures during construction of the Project include adherence to federal and provincial regulations and guidelines regarding collection and storage of explosives and solid waste, such as the federal Explosives Act. Additionally, during the winter periods of Construction, sand will be used on the Community Access Road for de-icing instead of road salt, if required. Herbicides (and pesticides) will not be used during construction.

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, Fisheries and Oceans Canada, and Ontario Ministry of Natural Resources, will be followed during construction. A list of mitigation measures to limit changes to surface water quality during construction is provided in the Surface Water Technical Support Document (**Appendix F**). Mitigation measures to limit changes to surface water quality are well understood and the methods have been demonstrated to be effective. The effectiveness of mitigation measures will

be evaluated during construction and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.5.3.6.3 Predicted Residual Effects

As described in Surface Water Technical Support Document (**Appendix F**), the Construction of the Project is predicted to result in changes to surface water quality that are negligible in magnitude. As such, no net residual effects on ungulate habitat availability and distribution are predicted and this interaction is not carried forward into the assessment.

9.4.5.3.7 Changes to Boreal Caribou and Moose from Changes to Groundwater

9.4.5.3.7.1 Potential Effects

Habitat Availability and Distribution

Alteration of groundwater levels due to Project activities could have negative effects on caribou and moose habitat availability and distribution. Changes to vegetation communities are anticipated to be of moderate magnitude and probable to occur (Vegetation Technical Support Document [**Appendix J**]; Peatlands Technical Support Document [**Appendix I**]).

9.4.5.3.7.2 Mitigation and Enhancement Measures

Habitat Availability and Distribution

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, Fisheries and Oceans Canada, and Ontario Ministry of Natural Resources, will be followed during construction.

A list of mitigation measures to limit changes to groundwater quantity during construction is provided in the Groundwater Technical Support Document (**Appendix H**). The effectiveness of mitigation measures will be evaluated during construction and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.5.3.7.3 Predicted Residual Effects

With the implementation of mitigation measures, changes to groundwater regimes will be minimized and impacts on retained vegetation communities and ungulate habitat availability and distribution should be minimal. However, there are still anticipated to be measurable changes to vegetation due to change to groundwater quantity, which are

predicted to result in a residual effect on caribou and moose habitat availability and distribution. As such, this interaction is carried forward to the residual effects characterization.

Effects from changes to groundwater quantity are predicted to be probable, irreversible (long term), continuous, and confined to the effects assessment Local Study Area. Effects from changes to groundwater quantity on the ability of the caribou and moose populations in the effects assessment Regional Study Area to remain self-sustaining and ecologically effective are anticipated to be negative but negligible in magnitude.

9.4.5.3.8 Changes to Boreal Caribou and Moose from Increase in Wildlife Attractants

9.4.5.3.8.1 Potential Effects

Survival and Reproduction

An increase in wildlife attractants during construction of the Project could have an adverse effect on the survival and reproduction of ungulate populations in the ungulate effects assessment Local Study Area.

In addition, ungulates may be attracted to areas within or near the effects assessment Construction Disturbance Area if certain resources become available during construction, such as de-icing salts. De-icing salts can provide a source of sodium for ungulates, and hotspots of moose-vehicle collisions have been found to occur near areas where de-icing salt ponds are present (Laliberté and St-Laurent, 2020; Rea et al., 2021). Indigenous Knowledge provided by Marten Falls First Nation included concerns related to the use of de-icing agents such as salt that may act as a moose and caribou attractant, resulting in increased potential for animal fatality due to vehicular collision and higher volume of hunters and poachers (Marten Falls First Nation, 2023).

9.4.5.3.8.2 Mitigation and Enhancement Measures

Habitat Availability and Distribution

Mitigations outlined will be implemented to minimize effects from increased wildlife attractants on caribou survival and reproduction in the ungulate effects assessment Local Study Area during construction.

An Environmental Protection Plan and Waste Management Plan will be developed and implemented that includes policies and actions anticipated to mitigate the attraction of wildlife to the effects assessment Construction Disturbance Area, particularly near the

temporary construction staging areas and temporary construction camps. During construction, the following mitigations will be implemented:

- The effects assessment Construction Disturbance Area will be kept clear of attractants such as food scraps and food containers to prevent attracting wildlife;
- Food wastes and oil products will be collected and temporarily stored in wildlife-proof containers. The containers will be transported offsite for recycling or disposed at a licensed disposal facility;
- Potentially toxic materials that attract wildlife will be stored in secure areas inaccessible to wildlife (for example, buildings, storage areas surrounded by wildlife-proof fencing), and toxic materials will be monitored continuously when removed from storage until they are used or returned to storage to prevent wildlife accessing and ingesting the materials;
- All personnel associated with the Project will be educated on the hazards of littering and feeding wildlife; and
- Littering and the feeding or harassment of wildlife will be prohibited by all Project personnel and is expected to reduce nuisance wildlife in and near the effects assessment Construction Disturbance Area.

The above mitigation measures will limit attraction to roads by carnivores to roadkill, which benefits ungulates by reducing attraction to the Project area during construction. In addition, de-icing salts will not be used during construction of the unpaved / gravel Community Access Road.

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction.

Mitigation measures to wildlife attractants are well understood and the methods have been demonstrated to be effective. The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.5.3.8.3 Predicted Residual Effects

The implementation of mitigation measures described above, including effective waste management practices and avoidance of de-icing salt use, are expected to limit the attraction of ungulates and their predators to the effects assessment Construction Disturbance Area during construction. However, attraction to the Project could still

occur. As such, the Project is expected to result in a net residual effect on caribou and moose survival and reproduction. This interaction was carried forward into the residual effects characterization.

Effects are predicted to be possible, irreversible, continuous, and confined to the effects assessment Construction Disturbance Area. Effects from wildlife attractants and changes to predator-prey relationships on the ability of the ungulate populations in the caribou and moose effects assessment Regional Study Areas to remain self-sustaining and ecologically functional are anticipated to be negative and negligible in magnitude.

9.4.5.3.9 Changes to Boreal Caribou and Moose from Blasting and Associated Fly Rock

9.4.5.3.9.1 Potential Effects

Survival and Reproduction

During construction, explosives will be used at quarry sites to excavate materials for use during construction and to remove bedrock or large boulders in the right-of-way. Blasting activities may produce fly rock that has the potential to strike ungulates in the vicinity, and cause injury or death. The risk of mortality from being struck by fly rock would be greatest for ungulates who occupy home ranges that overlap quarry sites where blasting will occur. Blasting will be infrequent and will occur over short durations during construction. Given the high level of construction activity that would be occurring in the area prior to the blast, ungulates are expected to avoid the immediate area.

The potential effects on ungulates from the sensory disturbances associated with blasting during construction are addressed separately under Sensory Disturbance.

9.4.5.3.9.2 Mitigation and Enhancement Measures

Survival and Reproduction

The presence of operating equipment, people, noise, and lights during construction is expected to result in some avoidance of the effects assessment Construction Disturbance Area by ungulates. An Environmental Protection Plan and Blasting and Communication Management Plan will be developed and implemented that includes policies and actions for avoiding and minimizing the risks of blasting and blasting materials to wildlife (including moose and caribou). Industry best practices will be used for blasting activities, including adherence to:

- Ontario Provincial Standard Specification – General Specification for the Use of Explosives (Ministry of Transportation, 2014)

- Ministry of Transportation Ontario Environmental Reference for Highway Design
- Ontario Regulation 244/97 (*Aggregate Resources Act*)
- Ministry of Transportation Ontario Noise Protocol and Environmental Guide for Noise
- Department of Fisheries and Oceans Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters

Blasting will be completed as quickly as possible to shorten the duration of disturbance. Open excavations and blasting areas will be fenced off if left unsupervised to avoid injury and mortality of wildlife. Quarry blasting and other construction activities will be suspended within 10 kilometres of known or potential High Use Areas for caribou during sensitive seasons (nursery areas: May 1 to July 14 very low tolerance, July 15 to September 15 low tolerance; winter use areas: December 1 to March 31; Ministry of Natural Resources, 2013a, 2013b). If adherence to the timing windows and restrictions is not possible, the owner / operator will develop site-specific mitigation and monitoring in consultation with appropriate regulatory agencies. This may include implementation of a buffer zone survey around the perimeter of blasting activities and surrounding forested habitat, whereby blasting will be prohibited if large mammals (in other words, moose and / or caribou) are observed within 500 metres from the blasting location.

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction.

A list of mitigation measures that will be implemented during construction is provided in Acoustic and Vibration Technical Support Document (**Appendix P**). The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.5.3.9.3 Predicted Residual Effects

Due to the infrequent timing of blasting, and with the implementation of mitigation, blasting and fly rock from the Project during construction is not expected to result in injury or mortality of caribou or moose. There is no net effect predicted for this Project–environment interaction on ungulate survival and reproduction. Therefore, this interaction was not carried forward in the assessment.

9.4.5.3.10 Changes to Boreal Caribou and Moose from Chemical or Hazardous Material Spills

9.4.5.3.10.1 Potential Effects

Survival and Reproduction

Spills that occur in high enough concentrations can contaminate soils and affect aquatic organisms, soil organisms, vegetation, and wildlife, including ungulates. Direct exposure to the chemical through ingestion of contaminated water, soil or vegetation could result in acute or chronic illness or death. As a result, there is potential that Construction of the Project could cause chemical / hazardous material spills that could negatively affect the survival and reproduction of ungulate populations in the ungulate effects assessment Local Study Area.

9.4.5.3.10.2 Mitigation and Enhancement Measures

Survival and Reproduction

Mitigations during construction include adherence to federal and provincial regulations and guidelines regarding fuel and residue, chemical product, petroleum product, and hazardous substance collection and storage, use and handling, and disposal and treatment, such as the federal *Transportation of Dangerous Goods Act*, the Ontario Dangerous Goods Handling and Transportation Act, and the Ontario Environment Act. Additionally, an environmental monitoring program will be developed and implemented and will include policies and actions for limiting effects from spills on ungulate habitat.

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction.

A list of mitigation measures to limit changes to surface water and groundwater quality from spills during construction is provided in the Surface Water Technical Support Document (**Appendix F**) and the Groundwater Technical Support Document (**Appendix H**). Mitigation measures to limit chemical or hazardous material spills are well understood, and the methods have been demonstrated to be effective. The effectiveness of mitigation measures will be evaluated throughout Construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.5.3.10.3 Predicted Residual Effects

There are predicted to be no residual effects from chemical or hazardous material spills on surface water quality, groundwater, soil, or vegetation quality during construction. As such, there was predicted to be no net effect on ungulate survival and reproduction, relative to existing conditions. Therefore, the potential effects of chemical or hazardous material spills were not carried forward in the assessment.

9.4.5.3.11 Changes to Boreal Caribou from Habitat Loss and Alteration

9.4.5.3.11.1 Potential Effects

Habitat Availability

The Construction of the Project is expected to affect caribou habitat availability and quality in the Ungulate effects assessment Local Study Area and caribou effects assessment Regional Study Area.

Direct habitat loss would be contained within the effects assessment Construction Disturbance Area. A conservative assessment has been made by assuming that the entire effects assessment Construction Disturbance Area (4,700 hectares) is cleared of vegetation during construction.

Clearing of vegetation in the Construction Disturbance Area will directly affect the Albany River Provincial Park by removing 5.7 hectares in the Park. The other two provincial parks in the Ungulate Local Study Area (Little Current River and Ogoki River) will not be directly affected by vegetation removal in the Construction Disturbance Area (Section 7.3.1.1 of the Vegetation Technical Support Document [**Appendix J**]).

The effects assessment Construction Disturbance Area is predicted to permanently remove Category 1, 2, 3 functional habitat during construction, as follows (**Figure 9.4-7** to **Figure 9.4-9**):

- Category 1: Approximately 2,457 hectares of known and potential new Category 1 habitat will be removed (this includes 2,220 hectares of nursery areas, 1,182 hectares of winter use areas, and 643 hectares of travel corridors; areas that function as more than one Category 1 habitat type were not double counted). This represents approximately 52 percent of the effects assessment Construction Disturbance Area;
- Category 2: 1,611 hectares of known and potential new Category 2 seasonal range habitat will be removed. This represents approximately 34 percent of the effects assessment Construction Disturbance Area; and

- Category 3: 632 hectares of known and potential new Category 3 areas, including 8.8 hectares of water and 1.7 hectares of permanent disturbances, will be removed. This represents approximately 13 percent of the effects assessment Construction Disturbance Area.

Sensory disturbance associated with the Project construction activities is expected to also reduce the amount and quality of functional habitat if caribou avoid areas in proximity to the Project. This is considered indirect habitat loss and is accounted for by adding a 500 metre buffer to the effects assessment Construction Disturbance Area as per the approach with the federal recovery strategy (Environment and Climate Change Canada, 2020). The Construction Disturbance Area with a 500 metre buffer (in other words, direct and indirect habitat loss) encompasses an area of 31,717 hectares. Of that, 6,376 hectares overlaps existing anthropogenic disturbance.

The direct and indirect habitat loss associated with the Construction of the Project (Construction Disturbance Area + 500 metre buffer) is predicted to permanently remove Categories 1, 2, and 3 functional habitats **(Figure 9.4-7** to **Figure 9.4-9**):

- Category 1: 17,514 hectares of known and potential new Category 1 habitat will be removed (this includes 15,057 hectares of nursery areas, 10,769 hectares of winter use areas and 6,812 hectares of travel corridors; areas that function as more than one Category 1 habitat type were not double counted). This equates to approximately 55 percent of the spatial extent of the Construction Disturbance Area with a 500 metre buffer;
- Category 2: 9,317 hectares of known and potential Category 2 seasonal range habitat will be removed; and
- Category 3: 4,887 hectares of known and potential Category 3 areas, which includes 187 hectares of water, will be removed.

Habitat loss and alteration as a result of the Project Construction may affect caribou in a variety of ways, including the direct loss of important habitat areas that are necessary for biological functions (for example, Category 1 nursery areas) as well as potentially displacing caribou into less suitable habitats. These less suitable areas may have more competition for resources (between boreal caribou, eastern migratory caribou, and / or moose) and / or increased predation risk, which can subsequently have negative implications on survival and reproduction (Beyer et al., 2013; Beauchesne et al., 2014; Calizza et al., 2017; Rudolph et al., 2017; Mumma et al., 2018; Neufeld et al., 2021; Nagy-Reis et al., 2021).

Figure 9.4-7: Known and Potential New Caribou Category 1 Nursery Areas in the Construction Disturbance Area + 500 metre buffer in the Residual Effects Assessment

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Figure 9.4-8: Known and Potential New Caribou Category 1 Winter Use Areas in the Construction Disturbance Area + 500 metre buffer in the Residual Effects Assessment

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Figure 9.4-9: Potential New Caribou Category 1 Travel Corridors in the Construction Disturbance Area + 500 metre buffer in the Residual Effects Assessment

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Local Study Area

The Project including a 500 metre buffer will add 25,342 hectares of permanent disturbance in the ungulate effects assessment Local Study Area (**Figure 9.4-10**). This is a conservative estimate because the Project footprint includes temporary features (for example, laydown areas) that may be reclaimed or revegetated following construction. The Project is expected to increase the proportion of total disturbance (anthropogenic and natural combined) in the ungulate effects assessment Local Study Area from 21.9 percent to 26.6 percent.

The amount of known and potential new Category 1 functional habitat that remains in the ungulate effects assessment Local Study Area with the addition of the Project (Construction Disturbance Area + 500 metre buffer) will be reduced compared to the existing conditions in the effects assessment area (**Figure 9.4-7** to **Figure 9.4-9**):

- Category 1 habitat in the ungulate effects assessment Local Study Area will be reduced by 6.7 percent. This includes a loss of:
  - 15,047 hectares of Category 1 nursery areas (-6.7 percent relative to the existing environment).
  - 10,769 hectares of Category 1 winter use areas (-6.2 percent relative to the existing environment).
  - 6,812 hectares of Category 1 travel corridors (-6.4 percent relative to the existing environment).
- Category 2 seasonal use areas in the ungulate effects assessment Local Study Area will be reduced by 6.3 percent; and
- Category 3 – remaining areas undisturbed in the ungulate effects assessment Local Study Area will be reduced by 9.9 percent.

Seasonal habitat quality in the ungulate effects assessment Local Study Area will be reduced with the addition of the Project by 5.7 percent to 6.7 percent relative to the existing environment. A summary of the combined loss of high and moderate quality habitat is as follows:

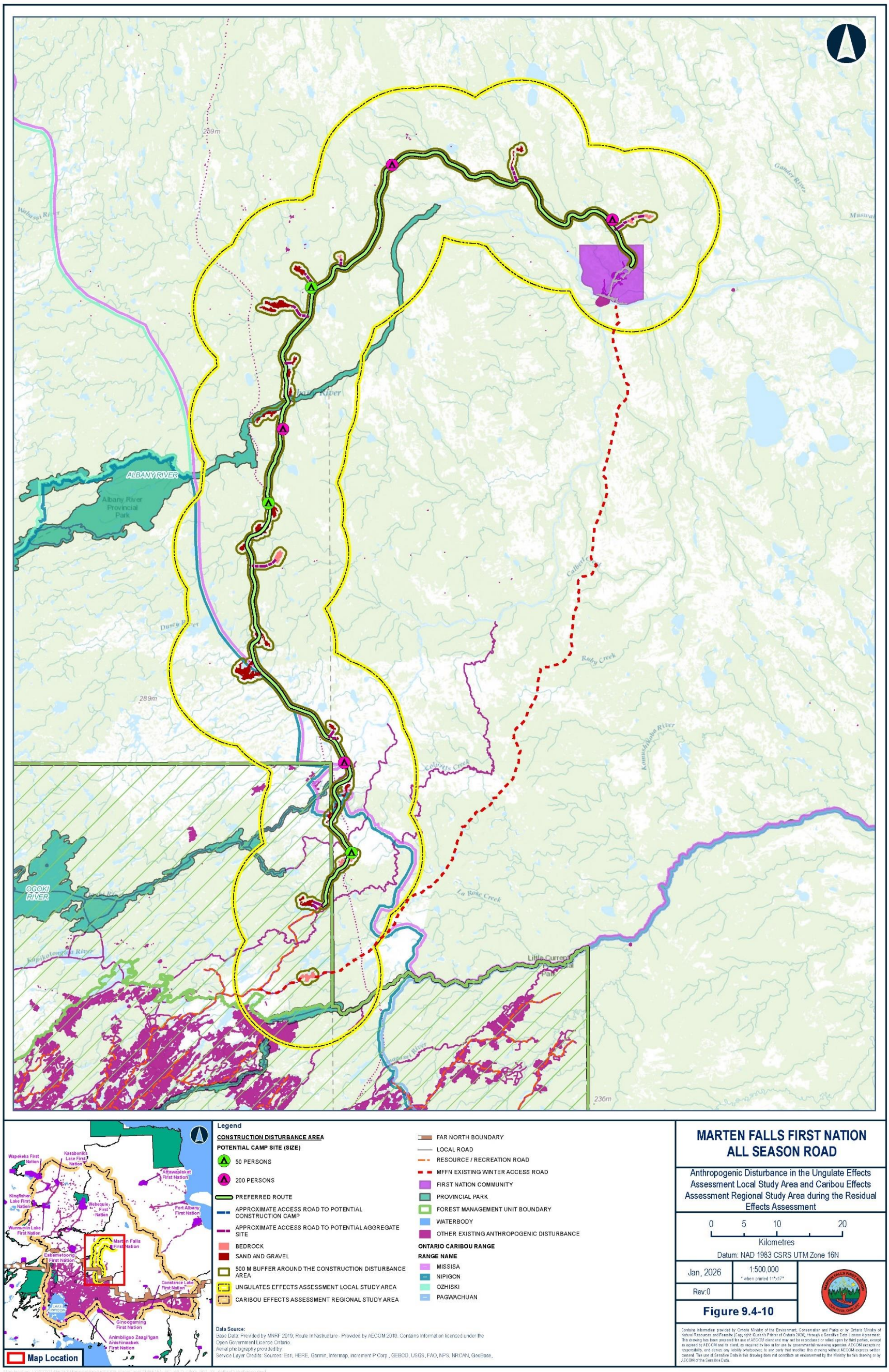
- 17,689 hectares of high and moderate quality calving habitat will be lost in the ungulate effects assessment Local Study Area as a result of the addition of the effects assessment Construction Disturbance Area; this represents a change of approximately –6.2 percent of high and moderate quality calving habitat in the ungulate effects assessment Local Study Area relative to the existing environment;

- 18,281 hectares of high and moderate quality summer habitat will be lost in the ungulate effects assessment Local Study Area as a result of the addition of the effects assessment Construction Disturbance Area; this represents a change of approximately –6.7 percent of high and moderate quality summer habitat in the ungulate effects assessment Local Study Area relative to the existing environment;
- 13,965 hectares of high and moderate quality fall habitat will be lost in the ungulate effects assessment Local Study Area as a result of the addition of the effects assessment Construction Disturbance Area; this represents a change of approximately –6.2 percent of high and moderate quality fall habitat in the ungulate effects assessment Local Study Area relative to the existing environment;
- 13,893 hectares of high and moderate quality winter habitat will be lost in the ungulate effects assessment Local Study Area as a result of the addition of the effects assessment Construction Disturbance Area; this represents a change of approximately –5.7 percent of high and moderate quality winter habitat in the ungulate effects assessment Local Study Area relative to the existing environment; and
- 15,295 hectares of high and moderate quality pre-calving habitat will be lost in the ungulate effects assessment Local Study Area as a result of the addition of the effects assessment Construction Disturbance Area; this represents a change of approximately -6.0 percent of high and moderate quality pre-calving habitat in the ungulate effects assessment Local Study Area relative to the existing environment.

Regional Study Area

The Project (including 500 metre buffer) will add 25,342 hectares of permanent disturbance in the caribou effects assessment Regional Study Area (**Figure 9.4-10**). This is a conservative estimate because the Project footprint includes temporary features (for example, laydown areas) that may be reclaimed or revegetated following construction. The Project is expected to increase the proportion of total disturbance (anthropogenic and natural combined) in the caribou effects assessment Regional Study Area from 24.3 percent to 24.4 percent. This remains below the 35 percent disturbance threshold identified in the federal recovery strategy for boreal Caribou as necessary to achieve and sustain self-sustaining populations (Environment and Climate Change Canada, 2020).

Figure 9.4-10: Anthropogenic Disturbance in the Ungulates Effects Assessment Local Study Area and Caribou Effects Assessment Regional Study Area during the Residual Effects Assessment



The amount of known and potential new Category 1 functional habitat that remains in the caribou effects assessment Regional Study Area with the addition of the Project will be reduced compared to the existing conditions in the effects assessment area (**Figure 9.4-11** to **Figure 9.4-13**):

- Category 1 habitat in the caribou effects assessment Regional Study Area will be reduced by 0.2 percent (17,514 hectares). This includes a decrease of 0.2 percent of nursery areas relative to the existing environment, 0.1 percent of winter use areas relative to existing environment, and 0.2 percent of travel corridors relative to the existing environment;
- Category 2 seasonal use areas in the caribou effects assessment Regional Study Area will be reduced by 0.2 percent; and
- Category 3 remaining areas undisturbed in the caribou effects assessment Regional Study Area will be reduced by 0.2 percent.

Seasonal habitat quality in the caribou effects assessment Regional Study Area will be reduced with the additional of the Project by 0.2 percent to 0.5 percent, relative to the existing environment.

Missisa Range

The disturbance in the caribou effects assessment Regional Study Area is confined to the Missisa and Nipigon ranges. The Construction of the Project (including 500 metre buffer) will add 21,413 hectares of new permanent disturbance in the Missisa range (**Figure 9.4-10**). This is a conservative estimate because the Project footprint includes temporary features (for example, laydown areas) that may be reclaimed or revegetate naturally following Construction.

The Project (with 500 metre buffer) is expected to increase the proportion of total disturbance (anthropogenic and natural combined) in the Missisa range, from 6.2 percent in existing conditions to 6.5 percent. This remains below the 35 percent disturbance threshold identified in the federal recovery strategy for boreal Caribou as necessary to achieve and sustain self-sustaining populations (Environment and Climate Change Canada, 2020).

The amount of known and potential new Category 1 functional habitat that remains in the Missisa range with the addition of the Project will be reduced compared to the existing conditions in the effects assessment area (**Figure 9.4-11** to **Figure 9.4-13**):

- Category 1 nursery areas in the Missisa range will be reduced by 0.4 percent (13,842 hectares);

Figure 9.4-11: Known and Potential New Caribou Category 1 Nursery Areas in the Caribou Effects Assessment Regional Study Area during the Residual Effects Assessment

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Figure 9.4-12: Known and Potential New Caribou Category 1 Winter Use Areas in the Caribou Effects Assessment Regional Study Area during the Residual Effects Assessment

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Figure 9.4-13: Potential New Caribou Category 1 Travel Corridors in the Caribou Effects Assessment Regional Study Area during the Residual Effects Assessment

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- Category 1 winter use areas in the Missisa range will be reduced by 0.2 percent (10,769 hectares);
- Category 1 travel corridors in the Missisa range will be reduced by 0.2 percent (6,812 hectares);
- Category 2 seasonal use areas in the Missisa range will be reduced by 0.6 percent (4,803 hectares); and
- Category 3 general use areas (not disturbed or water) in the Missisa range will be reduced by 1.9 percent (4,577 hectares).

Seasonal habitat quality in the Missisa range will be reduced with the addition of the Project relative to the existing environment**:**

- 16,645 hectares of high and moderate quality calving habitat will be lost in the Missisa range as a result of the addition of the effects assessment Construction Disturbance Area; this represents a change of -0.3 percent of high and moderate quality calving habitat in the Missisa range;
- 17,815 hectares of high and moderate quality summer habitat will be lost in the Missisa range as a result of the addition of the effects assessment Construction Disturbance Area; this represents a change of -0.4 percent of high and moderate quality summer habitat in the Missisa range;
- 13,921 hectares of high and moderate quality fall habitat will be lost in the Missisa range as a result of the addition of the effects assessment Construction Disturbance Area; this represents a change of -0.3 percent of high and moderate quality fall habitat in the Missisa range;
- 13,506 hectares of high and moderate quality winter habitat will be lost in the Missisa range as a result of the addition of the effects assessment Construction Disturbance Area; this represents a change of -0.3 percent of high and moderate quality winter habitat in the Missisa range; and
- 14,667 hectares of high and moderate quality pre-calving habitat will be lost in the Missisa range as a result of the addition of the effects assessment Construction Disturbance Area; this represents a change of -0.4 percent of high and moderate quality pre-calving habitat in the Missisa range.

Nipigon Range

The Construction of the Project (including 500 metre buffer) will add 3,929 hectares of new permanent disturbance in the Nipigon range (**Figure 9.4-10**). This is a conservative

estimate because the Project footprint includes temporary features (for example, laydown areas) that may be reclaimed following Construction.

At existing conditions, the proportion of anthropogenic and natural disturbance in the Nipigon range is 45.75 percent, which exceeds the 35 percent disturbance threshold identified in the federal recovery strategy for boreal caribou as necessary to achieve and sustain self-sustaining populations (Environment and Climate Change Canada, 2020). The addition of the Project (plus 500 metre buffer) is expected to increase the proportion of total disturbance in the Nipigon range by approximately 0.5 percent, to 45.83 percent.

The amount of known and potential new Category 1 functional habitat that remains in the Nipigon range with the addition of the Project will be reduced compared to the existing conditions in the effects assessment area (**Figure 9.4-11** to **Figure 9.4-13**):

- Category 1 nursery areas in the Nipigon range will be reduced by 0.1 percent (1,205 hectares);
- Category 1 winter use areas in the Nipigon range will not be reduced;
- Category 1 travel corridors in the Nipigon range will not be reduced;
- Category 2 seasonal use areas in the Nipigon range will be reduced by -0.4 percent (4,513 hectares); and
- Category 3 general use areas (not water or permanent disturbances) in the Nipigon range will be reduced by -0.01 percent (107 hectares).

Seasonal habitat quality in the Nipigon range will be reduced with the addition of the Project relative to existing conditions:

- 1,044 hectares of high and moderate quality calving habitat will be lost in the Nipigon range as a result of the addition of the effects assessment Construction Disturbance Area; this represents a change of -0.1 percent of high and moderate quality calving habitat in the Nipigon range;
- 466 hectares of high and moderate quality summer habitat will be lost in the Nipigon range as a result of the addition of the effects assessment Construction Disturbance Area; this represents a change of -0.1 percent of high and moderate quality summer habitat in the Nipigon range;
- 44 hectares of high and moderate quality fall habitat will be lost in the Nipigon range as a result of the addition of the effects assessment Construction Disturbance Area; this represents a change of -0.02 percent of high and moderate quality fall habitat in the Nipigon range;

- 387 hectares of high and moderate quality winter habitat will be lost in the Nipigon range as a result of the addition of the effects assessment Construction Disturbance Area; this represents a change of -0.08 percent of high and moderate quality winter habitat in the Nipigon range; and

628 hectares of high and moderate quality pre-calving habitat will be lost in the Nipigon range as a result of the addition of the effects assessment Construction Disturbance Area; this represents a change of -0.1 percent of high and moderate quality pre-calving habitat in the Nipigon range.

Habitat Distribution

Community members are concerned that the road will cut across migratory routes, affecting movement of animals, particularly moose and caribou (Marten Falls First Nation, 2023; Shared Value Solutions, 2024; Weenusk First Nation, 2023). Habitat alteration has the potential to make tracking and hunting caribou and moose species more challenging for Marten Falls First Nation members (Marten Falls First Nation, 2023; Weenusk First Nation, 2023). In addition, Marten Falls First Nation has expressed concerns related to health impacts on caribou species resulting in negative effects on animal size (Marten Falls First Nation, 2023).

Overall, the combination of direct habitat loss, indirect habitat loss, and fragmentation of suitable habitat from Construction of the Community Access Road are expected to result in a measurable change in habitat connectivity for caribou with home ranges that overlap the Project and ungulate effects assessment Local Study Area. However, in the caribou effects assessment Regional Study Area suitable habitats will remain largely connected. Changes that occur in the arrangement and connectivity of habitat will be permanent because the Project operations is indefinite; however, given animal movement and habitat use are dynamic over time, the magnitude of effect will likely vary during the lifespan of the Project.

The Construction of the Project's permanent and temporary linear features also has the potential to negatively affect caribou through increased human activity levels and sensory disturbance, increasing predation risk, hunter harvest pressure, and caribou-vehicle collisions.

Survival and Reproduction

During construction the Project is predicted to result in small changes in the distribution or connectivity of available undisturbed caribou habitat in the ungulate effects assessment Local Study Area and caribou effects assessment Regional Study Area relative to the level of direct and indirect disturbance under existing conditions. Changes

in habitat connectivity are more likely to affect caribou survival and reproduction if they impede access to high value areas such as nursery and winter use areas. The reproductive success of females and survival of calves are negatively affected if calving and post-calving habitats are unavailable, inadequate, or degraded (McCarthy et al., 2011; Environment and Climate Change Canada, 2020). As such, the loss of nursery areas and avoidance or reduced use of these areas due to proximity to disturbance, may influence local caribou survival and reproduction. This effect will be certain because the loss of high value habitat will be permanent. A reduction in local abundance is predicted to be continuous so long as individuals are displaced. Overall, habitat loss and alteration from Construction of the Project may displace a few individual caribou but is unlikely to have a demographic effect at the population level.

9.4.5.3.11.2 Mitigation and Enhancement Measures

Habitat Availability, Distribution and Survival and Reproduction

Mitigations outlined will be implemented during construction to limit effects from habitat loss and alteration on caribou habitat availability, distribution, and survival and reproduction as much as possible in the ungulate effects assessment Local Study Area and caribou effects assessment Regional Study Area (specifically in the Missisa and Nipigon ranges where habitat loss occurs). The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Avoidance of caribou sensitive and seasonally important habitat was considered in the assessment and selection of the Preferred Route. The Project footprint is designed to limit areas of vegetation clearing and soil disturbance to the extent feasible. Existing access roads will be used when available, and temporary activities will be concentrated spatially. Function, quality and connectivity of habitat features will be retained to the extent practical. Proper setbacks from known sensitive ecological features and key ungulate habitat features, including wetlands and mineral licks, will be used to the extent practicable; when sensitive ecological features are encountered and cannot be avoided, the applicable government agency will be engaged.

Construction of the Community Access Road will be conducted in phases to limit the amount of disturbance at any particular time and minimize barriers to movement. Elevation and slope of soil piles and berms will be minimized to allow ungulates to have clear line of sight to adjacent habitat. Along the right-of-way and access roads, gaps will be maintained in road berms and snowbanks to facilitate wildlife crossings at drainages, wildlife trails, strategic crossing points informed by movement data and Indigenous Knowledge, or connected habitat patches so that caribou movements across roads are not blocked. The Project construction schedule will avoid activities during the sensitive

timing windows for caribou (in other words, May 1 to September 15 for nursery areas, December 1 to March 31 for winter use areas) within 10 kilometres of known and potential new Category 1 areas, to the extent practical. When activity restrictions cannot be followed, the Ministry of the Environment, Conservation and Parks will be engaged to determine alternative approaches.

Construction practices will be utilized which encourage the eventual natural recovery and growth of native species (for example, minimize topsoil removal, preserve adequate substrate). When possible, work activities in wet areas will be scheduled during frozen conditions; under non-frozen conditions and where regulatory approvals allow, mats will be installed to limit effects on wetlands. Erosion control practices will encourage regrowth of vegetation. Inactive areas will likely be blocked with gates or physical control measures to prevent access. Marten Falls First Nation continues to engage in discussions with the Province regarding the ownership and future operations of the Community Access Road. Access and ownership including gating security / ID system, will require further dialogue between the communities and the Province.

Progressive restoration and revegetation will be implemented as non-permanent features will be decommissioned and restored or left to revegetate naturally. The time interval between commencement and completion of any work that disturbs earth surfaces will be a maximum of 20 calendar days. Commencement of such work will be considered to have occurred when the original stabilizing ground cover has been removed, including grubbing, or has been covered with fill material. Completion of such work will be considered to have occurred when the cover material (seed and mulch, seed and erosion control blanket, sod, rip-rap) has been applied. Where the timing of the operation results in a conflict with the application requirements of the specified cover, the owner / operator will determine appropriate interim measures that afford temporary protection until such a time as final cover can be applied.

Restored temporary use areas will be blocked to avoid re-entry and disturbance of revegetating areas through use of physical control measures (for example, rollback, removal of creek crossings). Restoration on site will consider maintaining or improving ungulate habitat, including planting native trees to accelerate revegetation. An Environmental Protection Plan and Cleanup and Reclamation Plan will be developed that includes practices for reclamation. Reclamation plans and practices will be confirmed through engagement with Indigenous communities.

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction. Additionally, a Preliminary Biodiversity Offset Plan

was developed (**Appendix AB**) to achieve no net loss of caribou functional habitat. Over the long term, measures undertaken as part of the Biodiversity Offset Plan would be implemented to achieve a net increase in functional caribou habitat. However, because there is uncertainty in the effectiveness and timing of offset measures in the Biodiversity Offset Plan, offsetting has not been considered in the conclusion of predicted residual effects below.

In addition to the above, Marten Falls First Nation has proposed a number of mitigation measures relating to potential habitat loss and habitat alteration. The community has suggested mitigation measures, some of which can't be implemented in practice, but are acknowledged here as being recommended:

- The Project be built a 1-hour walking distance from mammal habitat;
- Consideration of the probation of logging or other resource exploitation activities around or near mammal habitat;
- Integration of wildlife crossings and wildlife signs along the Project corridor, particularly for moose and caribou;
- Adjusting the Project route away from sensitive areas;
- Preventing any dams from being built in conjunction with the construction of the Project; and
- Offering environmental monitoring training and environmental monitoring opportunities for Marten Falls First Nation members (Marten Falls First Nation, 2023).

9.4.5.3.11.3 Predicted Residual Effects

The implementation of mitigation measures described above are expected to limit negative effects from habitat loss and alteration on caribou in the caribou effects assessment Regional Study Area. Direct habitat loss will occur during construction and will be confined to the effects assessment Construction Disturbance Area; indirect habitat loss will also occur within a 500 metre buffer around the effects assessment Construction Disturbance Area.

After mitigation, the Project is expected to result in a net residual effect on caribou habitat availability and distribution and survival and reproduction from habitat loss and alteration during construction and operations. Therefore, this interaction was carried forward in the assessment.

Effects on habitat availability, distribution, and survival and reproduction of Boreal caribou from habitat loss and alteration during construction are predicted to be certain and permanent (irreversible) because most of the effects assessment Construction

Disturbance Area will remain disturbed indefinitely. The effects on caribou will be continuous and vary from the ungulate effects assessment Local Study Area to the caribou effects assessment Regional Study Area (for winter use and nursery areas) to beyond regional (for movement and connectivity). Some individuals that were collared in the ungulate effects assessment Local Study Area demonstrated seasonal travel east to the James Bay range and north to the Far North / eastern migratory range. The number of individuals in the population(s) who use these extended travel corridors, and the regularity of these long-distance movements, is uncertain.

Effects from habitat loss and alteration on the ability of the caribou populations in the caribou effects assessment Regional Study Area to remain self-sustaining and ecologically functional are anticipated to be negative and of low magnitude for the Missisa range and moderate magnitude for the Nipigon range.

9.4.5.3.12 Changes to Boreal Caribou from Sensory Disturbance

9.4.5.3.12.1 Potential Effects

Habitat Loss and Distribution

Sensory disturbance during the Project construction could result in the indirect loss of suitable caribou habitat in the ungulate effects assessment Local Study Area if individuals avoid areas with sensory disturbance. Project activities are expected to produce loud noises, light spill, smells, and human activity that could cause caribou to avoid affected areas, potentially displacing them from suitable habitats for foraging, travel, rest, and refuge from predators. Noise during construction will be temporary, and some individuals may return when noise levels decrease.

During construction, sensory disturbance will mostly be confined to the active construction site(s) and will occur during the day for short durations spanning the start and end of the construction of each road segment. Unlike the construction of road segments, sensory disturbances at aggregate areas, quarry sites, access roads and construction camps are expected to occur over longer durations throughout Construction.

Construction activities, including construction and quarry blasting, are expected to produce ground vibration and an increase in air overpressure. As such, an increase in existing vibration levels is anticipated to occur on occasion, due to quarry and construction blasting activities, but blast-induced vibration is expected to be temporary in nature, occur only during specific activities, and limited to the vicinity of the effects assessment Construction Disturbance Area.

Survival and Reproduction

Sensory disturbance during the Construction of the Project may elicit negative effects on caribou induced through short-term behavioural and physiological responses, including startle response, elevated heart rate and increased production of glucocorticoids (in other words, steroid hormone produced in response to stress; Creel et al., 2002; Ewacha et al., 2017; Mirante et al., 2025). Changes in time spent feeding and running from sensory disturbances can decrease body condition, which can increase caribou vulnerability to predation. Loss of body weight in adult females due to interactions with zones of influence from anthropogenic developments also may result in reduced calf production.

Effects on survival and reproduction are predicted to be limited to the ungulate effects assessment Local Study Area and more likely to occur when the disturbance is in proximity to high use areas (in other words, Category 1 habitat).

9.4.5.3.12.2 Mitigation and Enhancement Measures

Mitigations outlined will be implemented to minimize effects from sensory disturbance on caribou habitat availability, distribution, and survival and reproduction in the ungulate effects assessment Local Study Area during construction. Additional mitigations to reduce effects from noise during construction is provided in Acoustic and Vibration Technical Support Document (**Appendix P**).

Avoidance of caribou sensitive and seasonally important habitat was considered in the assessment and selection of the Preferred Route. Proper setbacks from known sensitive ecological features and key ungulate habitat features, including wetlands and mineral licks, will be used to the extent practicable; when sensitive ecological features are encountered and cannot be avoided, the applicable government agency will be engaged.

Construction of the Community Access Road will be conducted in phases to limit the amount of disturbance at any particular time. Construction will be completed as quickly as possible to shorten the duration of disturbance. The Project construction schedule will avoid activities during the sensitive timing windows for caribou (in other words, May 1 to September 15 for nursery areas, December 1 to March 31 for winter use areas) within 10 kilometres of known and potential new Category 1 areas, to the extent practical. When activity restrictions cannot be followed, the Ministry of the Environment, Conservation and Parks will be engaged to determine alternative approaches.

An Environmental Protection Plan will be developed and implemented that includes measures to limit noise disturbance from construction activities; this includes prohibiting

use of engine retarder brakes, enforcing speed limits, reducing idling of vehicles, designing routes to minimize reversing (backup beeper), reducing traffic by locating camps near construction sites, and restricting construction traffic to designated areas and only construction personnel. Noise abatement, emission, and pollution control equipment on machinery will be in place, properly maintained and in good working order. Industry best practices will be used for blasting activities, including scheduling when in the vicinity of sensitive wildlife habitat areas. Forest buffers will be retained around quarries to reduce noise, where feasible. Aerial operations will be limited when possible; when not feasible, minimum ferry altitude of 400 metres above ground level will be maintained during sensitive timing periods to reduce sensory disturbance on caribou.

Light disturbance from nighttime operational activities will be limited by using directional lighting. Lighting required for Construction of the Project will be controlled, including direction (for example, focused on work areas and away from undisturbed areas) and timing (for example, minimize work at night) to minimize effects on caribou, while meeting operational health and safety requirements.

Vegetation will be established, as outlined on the required Rehabilitation Plan to align with the ‘Aggregate Resources of Ontario: Site Plan (2020) Standards. Reclaimed temporary use areas will be blocked to avoid re-entry and disturbance of revegetating areas through use of physical control measures (for example, rollback, removal of creek crossings). Restoration on site will consider maintaining or improving ungulate habitat, including planting native trees to accelerate revegetation. An Environmental Protection Plan and Cleanup and Reclamation Plan will be developed that includes practices for reclamation. Reclamation plans and practices will be confirmed through engagement with Indigenous communities.

9.4.5.3.12.3 Predicted Residual Effects

The implementation of mitigation measures is expected to limit negative effects from sensory disturbance in the ungulate effects assessment Local Study Area, but sensory disturbance is predicted to reduce the quality of caribou habitat by causing avoidance and increased movements away from the effects assessment Construction Disturbance Area. After mitigation, the Project is expected to result in a net residual effect on caribou habitat availability and distribution and survival and reproduction from sensory disturbance during construction and operations. Therefore, this interaction is carried forward in the assessment.

Effects on habitat availability, distribution and survival and reproduction of Boreal caribou from sensory disturbance during construction are predicted to be certain, irreversible, and

continuous. Effects will be confined to the ungulate effects assessment Local Study Area (for habitat availability and survival and reproduction) and extend to the caribou effects assessment Regional Study Area for habitat distribution (because of the effect on connectivity). Effects from sensory disturbance on the ability of the caribou populations in the caribou effects assessment Regional Study Area to remain self-sustaining and ecologically functional are anticipated to be negative and low in magnitude.

9.4.5.3.13 Changes to Boreal Caribou from Linear Barriers

9.4.5.3.13.1 Potential Effects

Habitat Availability and Distribution

Construction of the Project may result in fragmentation of caribou habitat. Fragmentation of wildlife habitat can result when linear corridor developments are placed in contiguous habitats and results in smaller, spatially distinct habitat patches (Andrews, 1990; Bayne et al., 2005; Beauchesne et al., 2014; Crooks et al., 2017; Thompson et al., 2019).

Habitat fragmentation from the Construction of linear corridors for the Project may also impede or restrict access to seasonally important habitats because of real (in other words, physical) or perceived (in other words, sensory) risk associated with the linear barrier and reduce the likelihood of caribou crossing. Alterations in species movement patterns, or barrier effects, can result in reduced use of suitable habitat and loss of seasonal resources, which can have demographic effects (Dyer et al., 2001; Carthew et al., 2009; Dunne and Quinn, 2009; LeBlond et al., 2013; Muhly et al., 2015; Environment and Climate Change Canada, 2020; DeMars et al., 2021).

Caribou in the ungulate effects assessment Local Study Area and the northern part of the caribou effects assessment Regional Study Area (in other words, the part of the study areas in the Missisa and Ozhiski ranges) are essentially naïve to permanent road disturbances and may demonstrate strong avoidance behaviours during construction and the early stage of Operations, which could result in a barrier to movement across the landscape of these study areas (in other words, beyond regional-scale effect). The effect would be continuous during the life of the Project and is likely to occur (in other words, probable) as animals may adapt to vehicle traffic and associated noise in the longer term.

Survival and Reproduction

Changes in habitat connectivity during construction are more likely to have demographic effects on caribou survival and reproduction if a linear barrier impedes or delays animal movement to important seasonal habitat such as nursery and winter use areas (Wilson et al., 2016; Boulanger et al., 2024). These changes can also reduce a population's

ecological effectiveness by reducing gene flow and limiting their potential for “rescue effects”, which occur when individuals immigrate into a small population and rescue that population from local extinction (Brown and Kodrick Brown, 1977; den Boer, 1981; Stacey and Taper, 1992).

The post-calving to autumn / rut periods are critical periods for foraging when animals must achieve satisfactory body weight and condition to increase the chance of becoming pregnant and producing a calf the following spring (Bradshaw et al., 1998; Cook et al., 2021). Linear barriers to high-quality foraging habitat, in addition to food quality, accessibility on summer and winter ranges, and insect harassment, can influence the body condition of caribou and contribute to population decline (van Moorter et al., 2020). Caribou that deflect around a linear barrier may have increased energetic costs to arrive at their seasonal habitat area, which may reduce survival and successful calf rearing.

9.4.5.3.13.2 Mitigation and Enhancement Measures

The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Avoidance of caribou sensitive and seasonally important habitat was considered in the assessment and selection of the Preferred Route. The Project footprint is designed to limit areas of vegetation clearing and soil disturbance to the extent possible. Existing access roads will be used when available, and temporary activities will be concentrated spatially. At watercourse crossings that occur within Category 1 caribou habitat and are on the north-south segment of the Preferred Route, and at watercourse crossings that occur within Category 1 habitat and on the east-west segment of the Preferred Route modified bridge and bridge embankments will be designed to incorporate terrestrial pathways adjacent to the aquatic habitat and allow for ungulate passage, where feasible given land cover considerations. These design features include increasing the height of bridge to minimum 4 metres vertical clearance, using natural substrates on the bridge embankments and under the bridge, allow for an unobstructed line of sight on either side of the bridge, and clear and maintain the minimum width of right-of-way at bridge crossings. In other locations along the Community Access Road where frequent crossings of species at risk are anticipated (in other words, in caribou Category 1 habitat and moose high suitability habitats), reduced speed limits will be implemented and wildlife-friendly road embankments with gentle slopes (in other words, gradual incline) and smooth crush material will be constructed to encourage safe crossing. Specific sites will be informed by caribou collar data, habitat modelling and Indigenous Knowledge.

Construction of the Community Access Road will be conducted in phases to concentrate activities spatially and temporally to minimize fragmentation and barriers to movement across the landscape. Elevation and slope of soil piles and berms will be minimized to allow ungulates to have clear line of sight to adjacent habitat (Wolfe et al., 2000). Along the Project right-of-way and the access roads, gaps will be maintained in road berms and snowbanks to facilitate wildlife crossing at drainages, wildlife trails, strategic crossing points informed by movement data and Indigenous Knowledge, or connected habitat patches so that caribou movements across roads are not blocked. Snowbanks will be limited as much as possible and to a height of less than 1.6 metres to allow for ungulates to see across the road (Rescan 2011). Snow clearing along the access roads will incorporate road pull-outs at regular intervals to provide refuge for wildlife moving along the Community Access Road corridor. Posted construction traffic speeds will be determined by temporary access road conditions and at the discretion of the Owner / Operator.

Progressive reclamation and revegetation will be implemented as non-permanent features will be decommissioned and reclaimed or revegetated naturally. Ongoing use of inactive or reclaimed areas will be prevented through the use of physical control measures.

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction and operations.

9.4.5.3.13.3 Predicted Residual Effects

The implementation of mitigation measures is expected to limit negative effects from linear barriers in the ungulate effects assessment Local Study Area and caribou effects assessment Regional Study Area. However, the addition of a new permanent road is predicted to result in alteration of caribou movement patterns and reduce the quality of caribou habitat by causing avoidance of the Construction Disturbance Area, particularly for caribou that move between the Missisa and Ozshiki ranges and Missisa and Nipigon ranges.

After mitigation, the Project is expected to result in a net residual effect on caribou habitat availability and distribution and survival and reproduction from linear barriers during construction. Therefore, this interaction was carried forward in the assessment.

Effects on habitat availability, distribution, and survival and reproduction of Boreal caribou from increased linear barriers during construction are predicted to be continuous and probable. Effects will be local for habitat availability and regional to

beyond regional for habitat distribution and survival and reproduction. During construction, effects will be long term and irreversible. Effects from linear barriers on the ability of the caribou populations in the caribou effects assessment Regional Study Area to remain self-sustaining and ecologically functional are anticipated to be negative and high in magnitude.

9.4.5.3.14 Changes to Boreal Caribou from Increased Predator Access

9.4.5.3.14.1 Potential Effects

Survival and Reproduction

During construction, vehicle traffic and human presence associated with the Project are likely to result in avoidance of the area by ungulates and predators. Once constructed, the Community Access Road is expected to have a sufficient amount of vehicle traffic that wolves would likely not or infrequently use the road right-of-way for travel during operations. However, predators are more likely to travel along access roads that have been decommissioned following Construction and have limited human activity because they will be naturally revegetating and may attract moose and deer; animals that select early seral vegetation for browse (McLoughin et al., 2019; Kautz et al., 2021). As a result, the increase in linear features due to the Project Construction could improve predator mobility and increase encounter rates between predators and ungulates in the ungulate effects assessment Local Study Area (James and Stuart-Smith, 2000; Whittington et al., 2011). Predators may be attracted by the moose and deer, and their increased presence and improved mobility may lead to increased encounter rates and predation risk for caribou.

This relationship, referred to as disturbance-mediated apparent competition, has been identified as a limiting factor for boreal caribou populations where linear densities are high and net primary productivity sustains high prey biomass (DeMars and Boutin, 2018; DeMars et al., 2019; Fryxell et al., 2020). The southern portion of the ungulate effects assessment Local Study Area (in other words, the Nipigon range) and caribou effects assessment Regional Study Area (in other words, the Nipigon and Pagwachuan ranges) contain a higher density of linear features and moose density relative to the northern portion of the study areas. The increase in early seral vegetation may have a negative effect on caribou survival and reproduction if moose alter their distribution to take advantage of the new foraging opportunities on the revegetating temporary features and wolves subsequently also select these areas. The effect would be continuous during the period that early to mid-seral vegetation occupies temporary features and is anticipated to be probable (in other words, likely to occur).

In contrast, in regions with low net productivity and low density of moose, the disturbance-mediated apparent competition mechanism may be relaxed or not apply (Neufeld et al., 2021; Superbie et al., 2022). In the northern portions of the ungulate effects assessment Local Study Area (in other words, in the Missisa range) and the caribou effects assessment Regional Study Area (in other words, the Missisa and Ozhiski ranges), the increase in early seral habitat following Construction is less likely to increase moose and wolf density and have a measurable effect on caribou survival and reproduction.

9.4.5.3.14.2 Mitigation and Enhancement Measures

Mitigations outlined will be implemented to minimize effects from increased predator access on caribou survival and reproduction in the ungulate effects assessment Local Study Area during construction.

The Project footprint is designed to limit areas of vegetation clearing and soil disturbance to the extent possible. Existing access roads will be used when available, and temporary activities will be concentrated spatially. Temporary linear features will be designed to decrease predator efficiency, by retaining vegetation under 2 metres, minimizing the width of linear features, and including switch backs and bends in temporary road construction. In addition, best management practices will be implemented during construction to reduce predator mobility when it is safe to do so; for example, only removing snow from access roads when necessary.

During construction, the ongoing use of inactive areas by predators will be minimized through physical control measures such as rollback, removal of creek crossings, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access. Progressive reclamation and revegetation will be implemented as non-permanent features will be decommissioned and reclaimed or revegetated naturally.

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction and operations. Additionally, a Preliminary Biodiversity Offset Plan (**Appendix AB**) has been developed to achieve no net loss of caribou habitat. Over the long term, measures undertaken as part of the Preliminary Biodiversity Offset Plan would be implemented to achieve a net increase in functional caribou habitat. However, because there is uncertainty in the effectiveness and timing of offset measures in the Preliminary Biodiversity Offset Plan, offsetting has not been considered in the conclusion of predicted residual effects.

The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.5.3.14.3 Predicted Residual Effects

Considering the potential increase in predator encounters will be restricted to Project roads and adjacent habitat, an increase in predation risk is predicted to be limited to caribou with home ranges that overlap the ungulate effects assessment Local Study Area. Most of the effect on the caribou population from increased predator access is predicted to occur within the ungulate effects assessment Local Study Area with little to no measurable change at the scale of the caribou effects assessment Regional Study Area.

After mitigation, the Project is expected to result in a net residual effect on caribou survival and reproduction from increased predator access during construction and operations. Therefore, this interaction was carried forward in the assessment.

Effects on reproduction and survival of Boreal caribou from increased predator access are predicted to be probable, continuous, and confined to the ungulate effects assessment Local Study Area. During construction, effects will be long term and irreversible Effects from increased predation on the ability of the caribou populations in the caribou effects assessment Regional Study Area to remain self-sustaining and ecologically functional are anticipated to be negative and negligible in magnitude.

9.4.5.3.15 Changes to Boreal Caribou from Increase in Public Access

9.4.5.3.15.1 Potential Effects

Survival and Reproduction

Linear features facilitate human movement into areas that were previously less accessible. As such, the Construction of a new permanent road and access roads for the Project can adversely affect caribou in the long term because of increased mortality from hunting and illegal harvest.

Non-Indigenous hunting of caribou has not been permitted in Ontario since 1929 (Ontario Woodland Caribou Recovery Team, 2008). An increase in human presence due to improved access will not increase non-Indigenous harvest rates of caribou because government-regulated hunting restrictions for non-Indigenous hunters would be maintained for this species at risk. Nonetheless, increased access into the region from improved roads and increased knowledge of the region due to the influx of workers and owner / operator could result in illegal harvest and other interactions with humans

that could disturb caribou during construction. Traffic along the Project roads and increased human presence in the effects assessment Construction Disturbance Area may result in avoidance by caribou of the accessible parts of the ungulate effects assessment Local Study Area, which could decrease the potential effect of hunters if caribou alter their distribution to more remote areas. Several Indigenous communities that have provided feedback on caribou have noted concerns specific to how an increase in public access to the Local Study Area may impact caribou survival and reproduction, highlighting the potential for effects on connections to the land and abilities to practice and transmit cultural conditions (Dillon, 2024; MNP LPP, 2024; Shared Value Solutions, 2024).

9.4.5.3.15.2 Mitigation and Enhancement Measures

Mitigations outlined will be implemented to minimize effects from increased public access on caribou survival and reproduction in the ungulate effects assessment Local Study Area during construction. The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Limiting public access to the effects assessment Construction Disturbance Area during construction will decrease risk of injury or mortality to caribou due to illegal hunting. Work areas will have gated site entrances and employees will be prohibited from hunting or carrying firearms in the effects assessment Construction Disturbance Area during construction.

An Environmental Protection Plan will be implemented that includes measures to control and / or restrict public use of access roads and the Construction Disturbance Area during construction. Measures may include gates / manned gates, signage, reduced road standard, and reduced speed limits. Marten Falls First Nation continues to engage in discussions with the Province regarding the ownership and future operations of the Community Access Road. Access and ownership including gating security / ID system, will require further dialogue between the communities and the Province. The Environmental Protection Plan will also outline measures to minimize wildlife-human interactions during construction, including an education program that details to staff, owner / operators, and visitors how to take all reasonable precautions to avoid wildlife conflicts, mandatory encounter and incident reporting, and signage identifying dangers of discharging firearms near industrial activity.

During construction, employees will be prohibited from personal use of motorized recreational vehicles. During construction, the ongoing use of inactive areas by the public will be minimized through physical control measures such as rollback, removal of

creek crossings, felling of timber across temporary access roads, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access. Progressive restoration and revegetation will be implemented as non-permanent features will be decommissioned and reclaimed or revegetated naturally. The time interval between commencement and completion of any work that disturbs earth surfaces will be a maximum of 20 calendar days. Commencement of such work will be considered to have occurred when the original stabilizing ground cover has been removed, including grubbing, or has been covered with fill material. Completion of such work will be considered to have occurred when the cover material (seed and mulch, seed and erosion control blanket, sod, rip-rap) has been applied. Where the timing of the operation results in a conflict with the application requirements of the specified cover, the owner / operator will determine appropriate interim measures that afford temporary protection until such a time as final cover can be applied.

9.4.5.3.15.3 Predicted Residual Effects

The Project is expected to result in a measurable change in public access in the ungulate effects assessment Local Study Area relative to the existing environment. The increase in people in the area during the Project lifespan could result in a minor increase in illegal harvesting of animals.

After mitigation, the Project is expected to result in a net residual effect on caribou survival and reproduction from increased public access during construction. Therefore, this interaction was carried forward in the assessment.

Effects from increases in public access are predicted to be unlikely during construction, irreversible, continuous, and confined to the ungulate effects assessment Local Study Area. Effects from increased hunting and poaching on the ability of the caribou populations in the caribou effects assessment Regional Study Area to remain self-sustaining and ecologically functional are anticipated to be negative and negligible in magnitude during construction.

9.4.5.3.16 Changes to Boreal Caribou from Collisions with Vehicles and Equipment

9.4.5.3.16.1 Potential Effects

Survival and Reproduction

There are currently no all-season roads in the ungulate effects assessment Local Study Area, and the community's winter access road (which is east of the ungulate effects assessment Local Study Area and within the Missisa caribou range) has a short season of use. As such, ungulate-vehicle collisions in the ungulate effects assessment Local

Study Area are expected to increase during construction relative to existing conditions. During construction, the source of traffic will be heavy equipment and vehicles transporting workers. Traffic will be confined to the active Construction segment(s) and on the segment(s) where workers will be travelling to and from the active site. Construction-related traffic is also anticipated to increase on roads south of the Project and in nearby communities (for example, Nakina, Geraldton) because of increased employment opportunities and human activity in the area.

Construction traffic in the effects assessment Construction Disturbance Area may result in avoidance by caribou during construction. Caribou have been found to reduce their use of areas within 1.2 to 5 kilometres from roads in Quebec (Leblond et al., 2011, 2013; Fortin et al., 2013). Avoidance of traffic by caribou would decrease the potential for injury or mortality from vehicle collisions.

9.4.5.3.16.2 Mitigation and Enhancement Measures

Mitigations outlined will be implemented to minimize effects from collisions with vehicles and equipment on caribou survival and reproduction in the ungulate effects assessment Local Study Area during construction. The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Collision risk during construction will be minimized with implementation of the Environmental Protection Plan, which includes measures to minimize collisions between wildlife and vehicles during construction. Measures will include an education program that details to staff, owner / operators, and visitors how to take all reasonable precautions to avoid wildlife collisions. In addition, the Environmental Protection Plan will include measures such as:

- Giving wildlife the right-of-way;
- Signage in areas where wildlife are regularly observed;
- Radio communication between staff of wildlife presence in construction area;
- Coordinating worker transportation to site to reduce traffic volumes, where practicable;
- Confining vehicle traffic to approved right-of-way, workspace and access roads;
- Leaving gaps in road berms and snowbanks to allow for movement across the construction area;
- Restrictions on the use of motorized recreational vehicles by employees and owner / operators while working, including prohibition of personal snowmobiles, all-terrain vehicles and other motorized recreational vehicles, except for authorized purposes;

- Mandatory encounter and incident reporting; and
- Reduced and enforced speed limits.

Construction vehicles' speed on the Community Access Road and temporary access roads will be adjusted according to conditions (for example, wildlife in the area, weather conditions). Long-term monitoring at diamond mines in the Northwest Territories and Nunavut has shown that the frequency of accidental mine-related wildlife mortalities from vehicle collisions has been extremely low (Dominion Diamond, 2014).

Pre-construction surveys will be completed to identify possible wildlife habitat features along the right-of-way (for example, mineral licks) and potential crossing locations where collision risks would be highest; signage will be placed in these areas. De-icing salts will not be used on the unpaved Community Access Road during construction to minimize ungulate attraction to the roadside.

Along the Project right-of-way and the access roads, gaps will be maintained in road berms and snowbanks to facilitate wildlife crossing at drainages, wildlife trails, strategic crossing points informed by movement data and Indigenous Knowledge, or connected habitat patches so that ungulate movements across roads are not blocked. Snow clearing along the access roads will incorporate road pull-outs at regular intervals to provide refuge for wildlife moving along the Community Access Road corridor.

In the event of a mortality of a species at risk due to collisions with equipment or vehicles during construction, the owner / operator and / or operator should report the incident to SAROntario@ontario.ca and the Natural Heritage Information Centre at NHICRequests@ontario.ca.

9.4.5.3.16.3 Predicted Residual Effects

Implementation of mitigation is predicted to limit caribou (and other wildlife) mortality from collisions with vehicles and equipment during construction. Considering the potential increase in caribou-vehicle collisions will be restricted to Project roads, a decrease in survival and reproduction is predicted to be limited to caribou with home ranges that overlap the ungulate effects assessment Local Study Area. The increase in mortality of caribou from vehicle collisions is predicted to be additive relative to other mortality factors and have little to no to effect on population survival and reproduction (in other words, lambda) at the scale of the caribou effects assessment Regional Study Area. If monitoring indicates that vehicle-related mortality may be strongly influencing caribou populations, then additional mitigation measures would be evaluated and implemented.

After mitigation, the Project is expected to result in a net residual effect on caribou survival and reproduction from collisions with vehicles and equipment during construction. Therefore, this interaction was carried forward in the assessment.

Effects are predicted to be possible during construction, irreversible, continuous, and confined to the ungulate effects assessment Local Study Area. Effects from collisions with vehicles and equipment on the ability of the caribou populations in the caribou effects assessment Regional Study Areas to remain self-sustaining and ecologically functional are anticipated to be negative and negligible in magnitude during construction and low to moderate magnitude.

9.4.5.3.17 Changes to Moose from Habitat Loss and Habitat Alteration

9.4.5.3.17.1 Potential Effects

Habitat Availability

During construction, the Project is expected to affect the quantity and quality of moose habitat in the ungulate effects assessment Local Study Area and the moose effects assessment Regional Study Area, which has the potential to adversely affect moose habitat use, forage availability and predator evasion. Direct habitat loss will be contained within the effects assessment Construction Disturbance Area. A conservative assessment has been made by assuming that the entire effects assessment Construction Disturbance Area will be cleared of vegetation during construction.

The effects assessment Construction Disturbance Area overlaps 4,700 hectares of land that is assumed to be directly removed by the Project during construction (**Figure 9.4-14**). Existing suitable habitat for moose varies across the effects assessment Construction Disturbance Area, and is predicted to contain high (758 hectares), moderate (3,704 hectares), low (141 hectares), and poor (97 hectares) suitability winter moose habitat (**Figure 9.4-14**). After land clearing activities, the area is considered poor suitability moose habitat.

High suitability habitat is concentrated primarily in the southcentral portion of the effects assessment Construction Disturbance Area in the northern portion of Segment BE (between the sand and gravel aggregate area “SG-08” and Alternative North Camp 1) (**Figure 4-3; Figure 9.4-14b**). This large concentration of high suitability habitat is a regenerating forest that burned in 1995 (about 30-years old) and likely provides moose with abundant forage under existing conditions (for example, early successional vegetation, shrub cover and young tree growth for browsing). Moose occupancy models were developed from aerial survey moose observations in 2022 and 2023 and predicted a high probability of moose occupancy in this regenerating burned area (**Figure 9.4-15**).

Figure 9.4-14: Winter Habitat Suitability for Moose in the Construction Disturbance Area + 500 metre Buffer in the Residual Effects Assessment

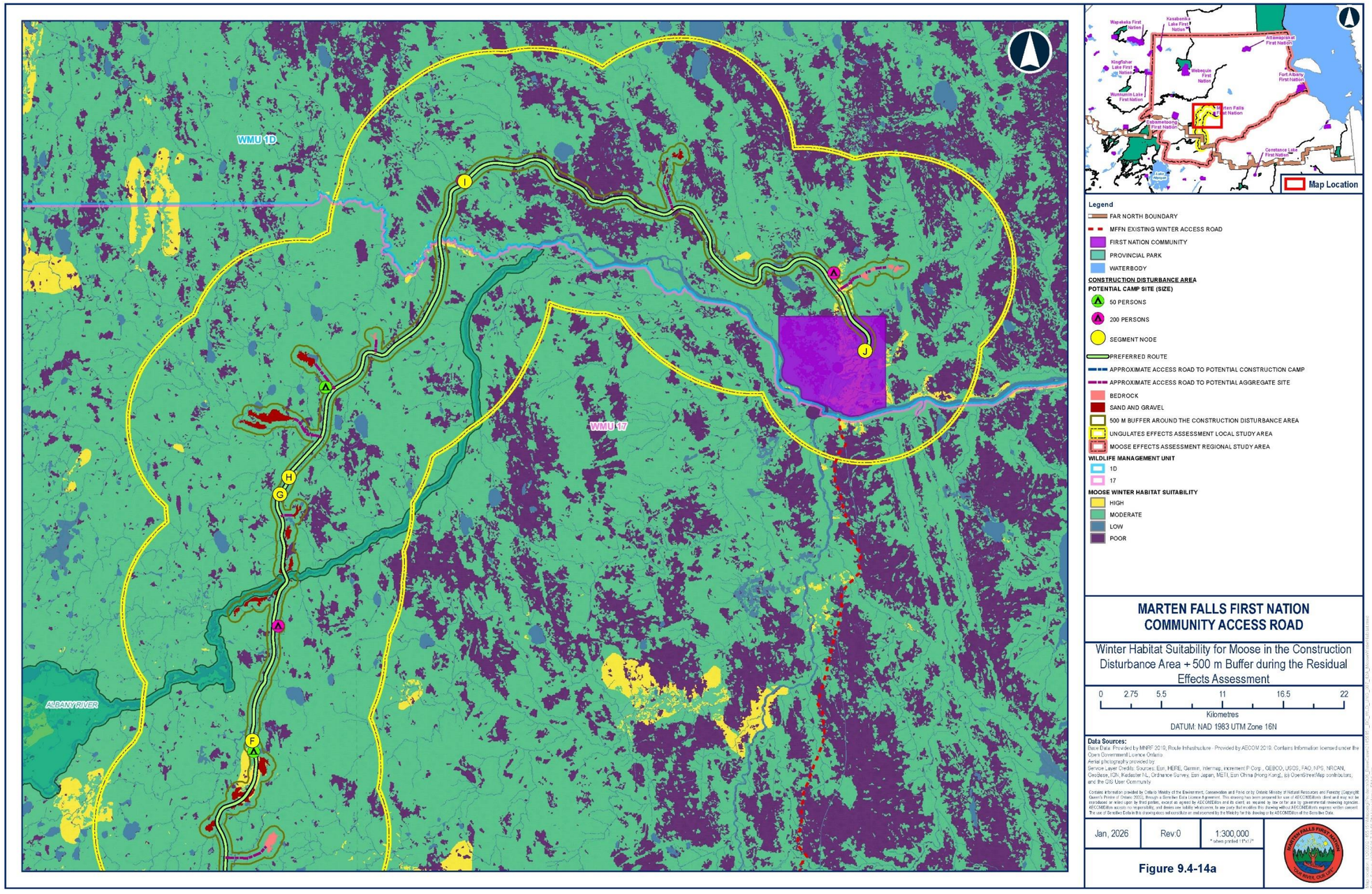


Figure 9.4-14b: Winter Habitat Suitability for Moose in the Construction Disturbance Area + 500 metre Buffer in the Residual Effects Assessment

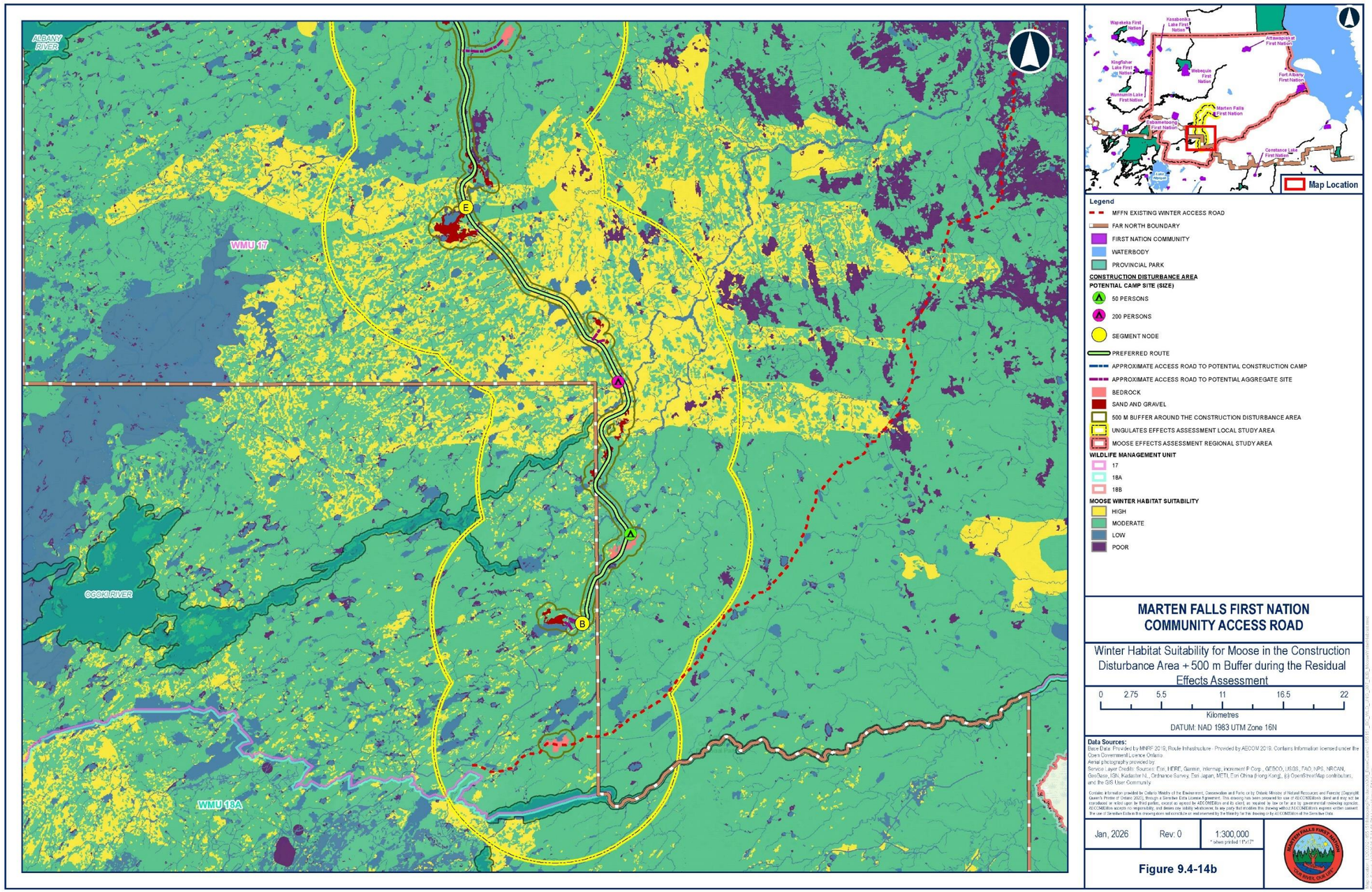
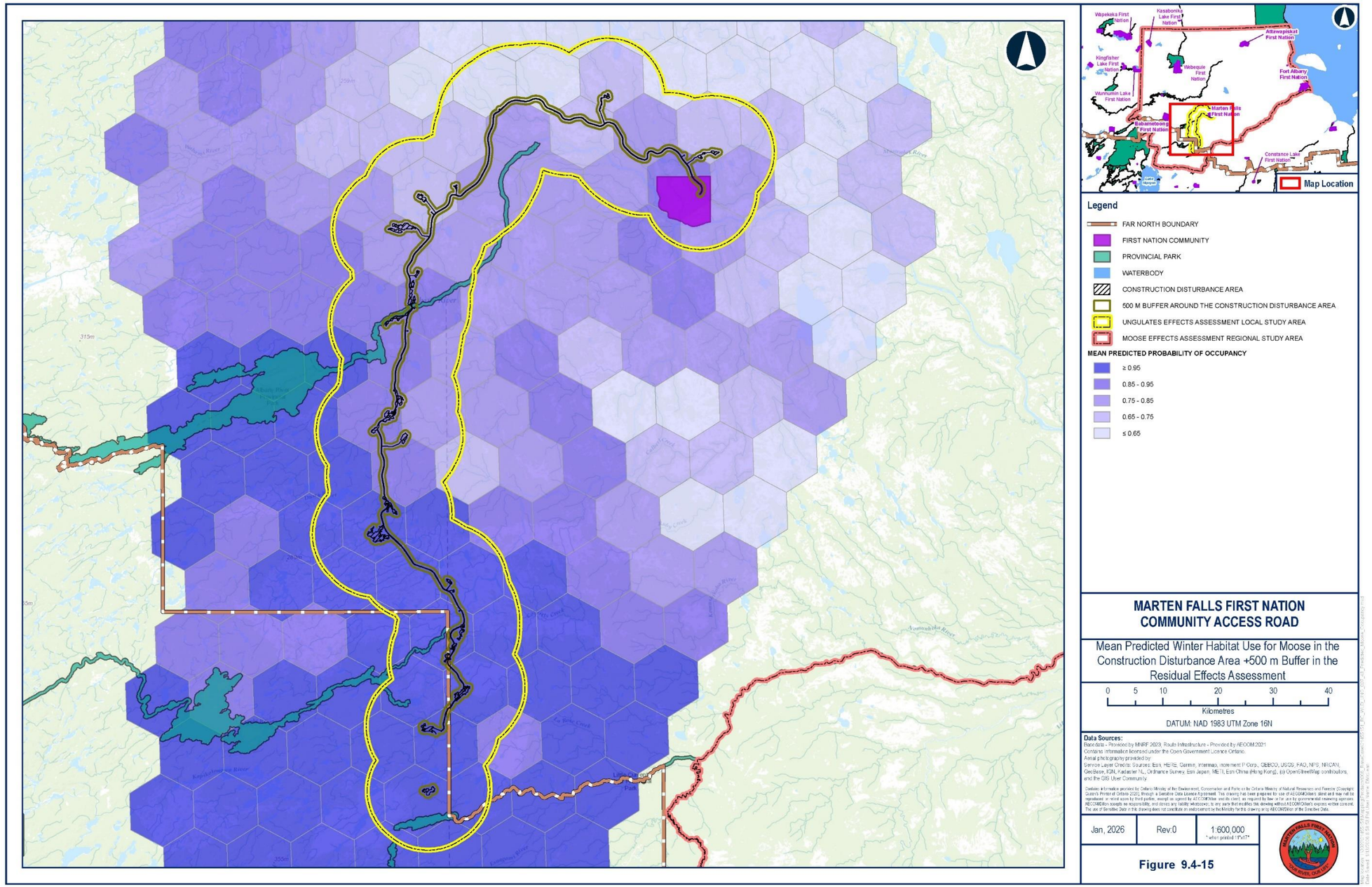


Figure 9.4-15: Mean Predicted Winter Habitat Use for Moose in the Construction Disturbance Area + 500 metre Buffer in the Residual Effects Assessment



This further suggests that the southcentral portions of the effects assessment Construction Disturbance Area and ungulate effects assessment Local Study Area provide highly suitable habitat for moose (**Figure 9.4-14b**)**.** Smaller extents of high suitability habitat occur within and adjacent to the easternmost portion of Segment IJ, the northern portion of Segment EF, and the Marten Falls First Nation (**Figure 9.4-14b**).

Moderate suitability moose habitat covers 79 percent of the effects assessment Construction Disturbance Area (**Figure 9.4-14**). It is dominated by landcover classes ≥ 40 years, including coniferous treed, coniferous swamp, mixed treed and treed fen. Low suitability habitat accounts for 3 percent of the effects assessment Construction Disturbance Area and includes herbaceous (≥ 40 years), sparse treed (≥ 40 years) and water landcover classes (**Figure 9.4-14**). Poor suitability habitat makes up the remaining 2 percent of the effects assessment Construction Disturbance Area (**Figure 9.4-14**). and consists of unfavourable winter habitat for moose, including open bog, open fen, and anthropogenic disturbance (Neilson and Boutin, 2017; Gillingham and Parker, 2008; McLoughlin et al., 2011).

Clearing of vegetation in the effects assessment Construction Disturbance Area will directly affect the Albany River Provincial Park by removing 5.7 hectares in the Park. The other two provincial parks in the Ungulate effects assessment Local Study Area (Little Current River and Ogoki River) will not be directly affected by vegetation removal in the Construction Disturbance Area (Section 7.3.1.1 of the Vegetation Technical Support Document [**Appendix J**]).

A total of 4,462 hectares of potential quality moose habitat in the ungulate effects assessment Local Study Area is expected to be directly removed during construction from land clearing activities. This represents a 1.2 percent and <0.1 percent decrease in potential quality moose habitat available in the ungulate effects assessment Local Study Area and moose effects assessment Regional Study Area, respectively, relative to existing conditions. Given the small proportion of potential quality moose habitat that will be directly removed during construction, available moose habitat is expected to remain abundant in the ungulate effects assessment Local Study Area and moose effects assessment Regional Study Area during construction.

Sensory disturbance (in other words, noise, smells, human presence) during construction has the potential to result in indirect loss of effective habitat of otherwise intact, suitable habitat for moose in the ungulate effects assessment Local Study Area if moose avoid areas with sensory disturbance. As the zone of avoidance or influence for moose due to sensory disturbance can vary and is not known for this area, habitat within a 500 metre buffer around the effects assessment Construction Disturbance Area was assumed to be affected by sensory disturbance. Using a precautionary approach to

avoid underestimating effects, within this 500 metre zone of influence, high and moderate suitability habitats were reduced to low suitability and low and poor suitability habitats were not changed (**Figure 9.4-14**). The 500 metre buffer contains 23,812 hectares of high and moderate suitability moose habitat that may be affected by sensory disturbance. If affected, this represents an additional 6.3 percent decrease in existing high and moderate suitability habitat in the ungulate effects assessment Local Study Area and 0.2 percent decrease in the moose effects assessment Regional Study Area.

Overall, direct and indirect (effective) habitat loss or alteration from the Project is expected to result in a decrease in available high and moderate suitability habitat, and an increase in low and poor suitability habitat during construction. Specifically, the Project is predicted to result in a 8.6 percent decrease in high suitability habitat and a 7.3 percent decrease in moderate suitability habitat in the ungulate effects assessment Local Study Area, and a small reduction (< 1.0 percent) in high and moderate suitability habitat at the Moose Regional Study. Low and poor suitability habitats are predicted to increase by 79.6 percent and 8.3 percent in the ungulate effects assessment Local Study Area, respectively, and by 1.0 percent and 0.2 percent in the moose effects assessment Regional Study Area, respectively. This assessment assumed that moose habitat loss (directly or indirectly) from land clearing, introducing Project infrastructure and sensory disturbance effects will remain unavailable in Construction (in other words, long-term effect).

The Project will directly remove about 1,607 hectares of wetlands during construction (bogs, fens, swamps, and fresh water marshes). This constitutes a loss of about 0.6 percent of existing wetlands in the ungulate effects assessment Local Study Area; therefore, wetlands are expected to remain abundant and available for moose in the ungulate effects assessment Local Study Area during construction.

Habitat Distribution

The Project is expected to affect moose habitat distribution and connectivity in the ungulate effects assessment Local Study Area and moose effects assessment Regional Study Area (in other words, local to regional scale effect) due to fragmentation of suitable moose habitat and incremental increases in anthropogenic disturbance. Most high and moderate suitability habitat in the ungulate effects assessment Local Study Area will remain intact and well connected in during construction, relative to existing conditions. However, the introduction of the Community Access Road will fragment (intersect) a large concentration of high suitability moose habitat in the southcentral portion of the ungulate effects assessment Local Study Area (**Figure 9.4-14**). Fragmentation from the Community Access Road could negatively affect moose, particularly individuals whose home ranges overlap this large area of high

suitability habitat, because it has the potential to reduce their ability to travel to suitable habitats located on opposite sides of the road. There is potential that the Community Access Road will disrupt or restrict moose movements when travelling across the ungulate effects assessment Local Study Area, especially in an east-west direction. During construction, the Project will also introduce 26.4 kilometres of access roads that extend from the Community Access Road to aggregate areas and construction camps; however, these access roads are less likely to have measurable effects on moose habitat connectivity.

The combination of direct habitat loss, indirect (effective) habitat loss or alteration (within the assumed 500 metre zone of influence), and fragmentation of suitable habitat from the Community Access Road, are expected to cause a measurable change in habitat connectivity for moose with home ranges that overlap the Project and ungulate effects assessment Local Study Area. In contrast, at the scale of the Moose effects assessment Regional Study Area, suitable moose habitats will remain largely intact and connected, and thus, the Project is predicted to have limited effects on habitat connectivity at the population level.

Survival and Reproduction

As described in Habitat Availability, Construction of the Project is predicted to directly remove 4,603 hectares of high, moderate and low suitability winter moose habitat (converting into poor suitability habitat), with the greatest loss of high suitability habitat expected in the southcentral portion of ungulate effects assessment Local Study Area (**Figure 9.4-14**). Moose in the region are expected to occupy home ranges varying from about 5.8 to 278 square kilometres (Vander Wal and Rodgers, 2012). The effects assessment Construction Disturbance Area is not expected to overlap the entire extent of individual moose home ranges, but instead is likely to remove available habitats within several moose home ranges in the ungulate effects assessment Local Study Area.

The majority of the effects assessment Construction Disturbance Area (84.5 percent) is located within Wildlife Management Unit 17, and the remaining northern segments are within Wildlife Management Unit 1D. As a result, moose with home ranges that overlap Wildlife Management Unit 17 are expected to be most affected by habitat loss and alteration due to the Project.

Vegetation clearing for the Project has the potential to effect moose by removing highly suitable habitats for moose that may function as important calving areas, foraging areas and / or refuge from predators. Habitat loss and alteration from the Project could displace individuals from highly suitable habitats into less favourable habitats. This

could lead to decreased forage availability through competition with other individuals and increased mortality risks from heightened predation and hunting pressures, ultimately affecting moose survival and reproduction.

Considering moose can occupy large home ranges (Vander Wal and Rodgers, 2012), and the Project will result in a relatively small direct and potential indirect loss or alteration of high and moderate suitability habitat (7.5 percent and 0.3 percent of the ungulate effects assessment Local Study Area and moose effects assessment Regional Study Area, respectively), habitat loss and alteration due to the Project is not expected to have a measurable effect on the survival and reproduction of moose at the population level of the moose effects assessment Regional Study Area.

9.4.5.3.17.2 Mitigation and Enhancement Measures

Mitigation measures outlined in **Section 9.4.5.3.11** will be implemented to avoid, minimize, and restore the effects from habitat loss and alteration on moose habitat availability, distribution, and survival and reproduction in the ungulate effects assessment Local Study Area and moose effects assessment Regional Study Area (specifically in Wildlife Management Unit 17 where a higher proportion of habitat loss and alteration will occur). Further, Marten Falls First Nation has proposed a number of mitigation measures to limit the effects on wildlife and their habitats from habitat loss and alteration, which are outlined in Marten Falls First Nation (2023).

The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.5.3.17.3 Predicted Residual Effects

A small amount of potential quality moose habitat that will be directly and indirectly lost or altered during construction, relative to the amount available in existing conditions. Specifically, the Project is predicted to directly remove 4,462 hectares of high and moderate suitability moose habitat that overlaps the effects assessment Construction Disturbance Area. This represents a 1.2 percent and <0.1 percent decrease in high and moderate habitat in the ungulate effects assessment Local Study Area and moose effects assessment Regional Study Area, respectively. Direct habitat loss is confined to the effects assessment Construction Disturbance Area. An additional 23,812 hectares of high and moderate suitability habitat is expected to be indirectly (effectively) lost or affected within the 500 metre buffer (zone of influence) around the effects assessment Construction Disturbance Area, which represents a potential 6.3 percent and 0.2 percent decrease in high and moderate suitability habitat in the ungulate effects

assessment Local Study Area and moose effects assessment Regional Study Area, respectively.

Overall, high and moderate suitability habitats are expected to decrease in availability by 7.5 percent in the ungulate effects assessment Local Study Area and 0.3 percent in the moose effects assessment Regional Study Area due to direct and indirect habitat loss or alteration associated with the Project. Therefore, a large proportion of suitable moose habitat is expected to remain undisturbed and connected in the ungulate effects assessment Local Study Area and the moose effects assessment Regional Study Area during construction.

The implementation of mitigation measures is expected to reduce negative effects from the Project on moose habitat availability, habitat distribution, and survival and reproduction; however, effects on moose from habitat loss and alteration cannot be avoided or mitigated entirely. Therefore, a net residual effect on moose is expected during construction from habitat loss and alteration. Residual effects from habitat loss and alteration were carried forward into characterization of residual effects.

Effects will be confined to the ungulate effects assessment Local Study Area (habitat availability, survival, and reproduction) and the moose effects assessment Regional Study Area (habitat connectivity and movement). Effects from direct habitat loss and alteration on the ability of the regional moose population to remain self-sustaining and ecologically effective are anticipated to be negative and low in magnitude.

9.4.5.3.18 Changes to Moose from Sensory Disturbance

9.4.5.3.18.1 Potential Effects

Habitat Availability and Distribution

Sensory disturbance (noise, smells, light spill, and human presence) produced by the Project could result in an indirect loss of effective moose habitat and habitat avoidance by moose in the ungulate effects assessment Local Study Area.

A 500 metre buffer around the effects assessment Construction Disturbance Area was precautionarily identified as the zone of influence where moose may exhibit avoidance behaviours and a loss of habitat effectiveness due to sensory disturbance. High and moderate suitability habitat within the 500 metre buffer includes a total of 23,812 hectares, which are conservatively assumed to decline in habitat effectiveness to low suitability habitat from exposure to Project-related sensory disturbance. This represents a 6.3 percent and 0.2 percent decrease in high and moderate suitability habitat in the

ungulate effects assessment Local Study Area and moose effects assessment Regional Study Area, respectively.

The Project is expected to produce loud noises, light spill, smells, and increased human presence and activity. During construction, major sources of sensory disturbance include the use of heavy equipment and vehicles, blasting activities, and increased human presence in active construction areas and at temporary construction camps. Heavy equipment and vehicles will be used during construction, such as road construction, bridge and culvert installation, and drilling / blasting / aggregate production. The type and quantity of heavy equipment will vary with construction activity but would introduce a substantial and continuous amount of noise, smells, and human presence, which are expected to induce avoidance behaviours in moose in proximity to the effects assessment Construction Disturbance Area.

Blasting will occur in quarry sites and aggregate areas, and along portions of the Community Access Road that contain bedrock or boulders. Blasting will be infrequent during construction but is anticipated to increase noise and ground vibration levels relative to existing conditions (Acoustic and Vibration Technical Support Document [WSP, 2026a]), which could cause startle and fleeing behaviours in moose in proximity to the blast zone. Construction camps are expected to have increased human presence, noise, smells (for example, cooking), and light spill into adjacent areas. Sensory disturbance during construction will be restricted to day light hours and primarily confined to the Community Access Road segment under construction and vicinity.

Construction activities, including construction and quarry blasting, are expected to produce ground vibration and an increase in air overpressure. As such, an increase in existing vibration levels, is anticipated to occur on occasion, due to quarry and construction blasting activities, but blast-induced vibration is expected to be temporary in nature, occur only during specific activities, and limited to the vicinity of the effects assessment Construction Disturbance Area. Ground vibration modelling results indicate that quarry and construction blasting are predicted to induce vibrations of about 33.9 and 12.12 millimetres per second at 100 metres from the blast source, respectively (Acoustic and Vibration Technical Support Document [WSP, 2026a]**)**. Ground vibrations are expected to decrease with increasing distance from the blast source, with ground vibrations of 2.6 and 0.9 millimetres per second predicted at a 500 metres distance from a quarry blast and a construction blast, respectively (Acoustic and Vibration Technical Support Document [WSP, 2026a]).

Noise levels at about 90 A-weighted decibels are likely to have adverse effects on mammals, often resulting in avoidance from the source of the sound, as well as strong startle or freeze responses (Manci et al., 1988). Lower noise levels can still affect

wildlife by causing internal reactions that can be energetically costly, such as increased heart rate or heightened vigilance (Herrero et al., 2005). Although the predicted maximum noise levels from the Project do not reach or exceed 90 A-weighted decibels, the substantial increases in noise levels and occasional increase in vibration (from blasting) relative to existing conditions, are likely to affect moose by reducing the quality of moose habitat near construction activities and by inducing behavioural changes (in other words, habitat avoidance, startle responses).

Sensory disturbance effects associated with construction activities are expected to be felt continuously by moose with home ranges that overlap the ungulate effects assessment Local Study Area within 4 kilometres of the effects assessment Construction Disturbance Area (where changes to noise levels are constrained). These effects are likely to be stronger during construction.

Survival and Reproduction

Sensory disturbance, like noise, can lead to behavioural changes in moose (fleeing or startle response) or elicit physiological stress (for example, increased heart rate) that can be energetically costly (Manci et al., 1988; Herrero et al., 2005).

As a result, increases in moose movement away from human activity and / or physiological stress due to Construction-related sensory disturbance are unlikely to have a measurable effect on the overall energy budget of moose in the ungulate effects assessment Local Study Area and the moose effects assessment Regional Study Area (Neumann et al., 2011). As such, sensory disturbances expected to result from construction activities are not expected to measurably influence the moose population's survival and reproduction.

Similar to the effect on moose habitat availability and distribution, sensory disturbance effects on survival and reproduction would most likely be stronger during construction.

9.4.5.3.18.2 Mitigation and Enhancement Measures

Mitigations outlined in **Section 9.4.5.3.11** will be implemented to minimize effects from sensory disturbance on moose habitat availability and distribution and survival and reproduction in the ungulate effects assessment Local Study Area during construction.

The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.5.3.18.3 Predicted Residual Effects

The implementation of mitigation measures is expected to limit negative effects on moose habitat availability, habitat distribution, and survival and reproduction from sensory disturbance; however, effects on moose from sensory disturbance cannot be entirely avoided or mitigated. As such, sensory disturbances from construction activities and operation of the Community Access Road are predicted to reduce the suitability of moose habitat by causing avoidance and movements away from the effects assessment Construction Disturbance Area. Therefore, changes to moose habitat availability, habitat distribution, and survival and reproduction from sensory disturbance during construction are anticipated to have a net residual effect on moose. Residual effects from sensory disturbance were carried forward into the characterization of residual effects.

After implementation of mitigation measures, effects on moose from sensory disturbance during construction are expected to be long-term and irreversible (permanent), but there is potential for effects to span a shorter duration (in other words, short-term effect). Effects from sensory disturbance are probable and will be confined to the ungulate effects assessment Local Study Area (in other words, local scale effect). Effects will be continuous during construction. Effects from Project-related sensory disturbance on the ability of the regional moose population to remain self-sustaining and ecologically effective are anticipated to be negative and low in magnitude during construction.

9.4.5.3.19 Changes to Moose from Linear Barriers

9.4.5.3.19.1 Potential Effects

Habitat Availability and Distribution

Overall, the introduction of linear barriers has the potential to affect moose movement, reduce habitat connectivity and alter moose distributions within the moose effects assessment Regional Study Area during construction. Effects from linear barriers are likely to occur (in other words, probable) based on varied responses of moose to the type and activity levels of linear features.

Survival and Reproduction

As described above, Project linear features like the Community Access Road could function as a barrier to moose movement and result in changes to moose habitat availability and distribution during construction. This could affect moose survival and reproduction by influencing population distribution (Gagnon et al., 2007; Bowman et al., 2010; Wattles et al., 2018), and access to important habitats or resources (for example, quality forage, calving grounds, mineral licks). If moose movements are substantially

hindered, this could lead to reduced genetic transfer between moose with home ranges on either side of the Community Access Road (Wang and Schreiber, 2001; Bendeguz et al., 2020) in the moose effects assessment Regional Study Area (in other words, regional scale effect). However, it is unlikely that the Community Access Road will restrict moose movements enough to measurably reduce the survival and reproduction of moose at the regional population level within the moose effects assessment Regional Study Area.

9.4.5.3.19.2 Mitigation and Enhancement Measures

Mitigations outlined in **Section 9.4.5.3.11** will be implemented to minimize effects from linear barriers on moose habitat availability and distribution and survival and reproduction in the ungulate effects assessment Local Study Area during construction.

At watercourse crossings that occur within Category 1 caribou habitat and are on the north-south segment of the Preferred Route, and at watercourse crossings that occur within Category 1 habitat and on the east-west segment of the Preferred Route modified bridge and bridge embankments will be designed to incorporate terrestrial pathways adjacent to the aquatic habitat and allow for ungulate passage, where feasible given land cover considerations. These design features include increasing the height of bridge to minimum 4 metres vertical clearance, using natural substrates on the bridge embankments and under the bridge, allow for an unobstructed line of sight on either side of the bridge, and clear and maintain the minimum width of right-of-way at bridge crossings. In other locations along the Community Access Road where frequent crossings of species at risk are anticipated [in other words, in caribou Category 1 habitat (**Figure 9.4-7** to **Figure 9.4-9**) and moose high suitability habitats (**Figure 9.4-14**)], reduced speed limits will be implemented and wildlife-friendly road embankments with gentle slopes (in other words, gradual incline) and smooth crush material will be constructed to encourage safe crossing. Specific sites will be informed by caribou collar data, habitat modelling and Indigenous Knowledge. The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.5.3.19.3 Predicted Residual Effects

The implementation of mitigation measures is expected to limit negative effects on moose habitat availability, habitat distribution, and survival and reproduction from introducing linear barriers in the ungulate effects assessment Local Study Area during construction. However, the addition of the permanent, Community Access Road is expected to affect moose movements and behaviour (in other words, inducing avoidant behaviour) within and surrounding the ungulate effects assessment Local Study Area (in other words, local to regional scale effect). Reduced moose mobility and habitat

connectivity is expected to be most affected within the southcentral portion of the ungulate effects assessment Local Study Area where a large extent of high suitability habitat will be fragmented (**Figure 9.4-14b**).

As such, changes to moose habitat availability, habitat distribution, and survival and reproduction from linear barriers during construction are anticipated to have a net residual effect and is carried forward to the residual effects characterization.

During construction, effects from linear barriers are probable and continuous. Effects on moose habitat availability and survival and reproduction are expected to be felt by moose with home ranges that overlap the ungulate effects assessment Local Study Area (local effect) but also may affect the movement and connectivity of animals in the surrounding habitats of the moose effects assessment Regional Study Area (regional effect). Effects from linear barriers on the ability of the regional moose population to remain self-sustaining and ecologically effective are anticipated to be negative and low in magnitude during construction.

9.4.5.3.20 Changes to Moose from Increase in Predator Access

9.4.5.3.20.1 Potential Effects

Survival and Reproduction

The Project is predicted to slightly increase linear feature density by 0.05 kilometres per square kilometre in the ungulate effects assessment Local Study Area and <0.01 kilometres per square kilometre in the moose effects assessment Regional Study Area. This includes introducing access roads and the Community Access Road, which could improve predator mobility and provide access to areas that may have been more difficult to access. Predators may rely on these linear features for travel particularly in the winter (except hibernating black bears) when the presence of deep snow in non-cleared areas makes travel more energetically costly (Gurarie et al., 2011; Dickie et al., 2020).

Wolves and black bears prefer to travel on secondary roads with limited human activity and often avoid primary roads with greater traffic volumes (Dickie et al., 2017; Kunkel and Pletscher, 2000; Whittington et al., 2005). Given this, it is expected that during construction, predators in the ungulate effects assessment Local Study Area would largely avoid the Community Access Road and secondary access roads due to the sensory disturbances, vehicle traffic, and human presence associated with construction activities along these roads. As such, predation risk (from increased predator access) is not expected to measurably increase for moose in the ungulate effects assessment Local Study Area during construction.

9.4.5.3.20.2 Mitigation and Enhancement Measures

Mitigations outlined in **Section 9.4.5.3.11** will be implemented to minimize effects from increased predator access on moose survival and reproduction in the ungulate effects assessment Local Study Area during construction.

The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.5.3.20.3 Predicted Residual Effects

Implementing mitigation measures is expected to reduce the negative effects on moose survival and reproduction from an increase in predator access (from introduced Project linear features). However, it is uncertain how frequently predators will use access roads and the level of increase in encounter rates that will result (effect is likely but uncertain).

Considering that potential increases in predator encounters will be restricted to Project roads and adjacent habitats, effects from an increase in predator access due to the Project will be largely constrained to the ungulate effects assessment Local Study Area. Therefore, an increase in predation risk is expected to primarily affect moose with home ranges that overlap the ungulate effects assessment Local Study Area, with little to no measurable change to the moose population at the scale of the moose effects assessment Regional Study Area. Changes to moose survival and reproduction from increased predator access due to the Project are anticipated to have a net residual effect and is carried forward to the residual effects characterization.

Effects on moose survival and reproduction from increased predator access are predicted to be felt continuously, long-term in duration, and irreversible (for the Community Access Road and permanent access roads) to reversible (for access roads that will be revegetated). During construction, effects will be confined to the ungulate effects assessment Local Study Area (local effect). Considering the increase in linear feature density due to the Project will be minimal (<0.01 kilometres per square kilometre in the moose effects assessment Regional Study Area), and linear corridors will remain absent or limited throughout much of the regional area, effects from increased predator access on the ability of the regional moose population to remain self-sustaining and ecologically functional are anticipated to be negative and low in magnitude during construction.

9.4.5.3.21 Changes to Moose from Increase in Public Access

9.4.5.3.21.1 Potential Effects

Survival and Reproduction

The introduction of the new permanent Community Access Road and access roads associated with the Project are expected to improve the ability of the public to access areas throughout the ungulate effects assessment Local Study Area with limited access (via roads or trails) under existing conditions. Currently, the ungulate effects assessment Local Study Area does not have a year-round access road, and only contains a short extent of the winter access road in the southern portion of the study area (**Figure 9.4-14b**). The Project proposes to construct a 184 kilometres-long Community Access Road, which will provide year-round access throughout the ungulate effects assessment Local Study Area, stretching from Painter Lake Road to the community of Marten Falls First Nation. As such, hunting, trapping and recreational opportunities for Indigenous and non-Indigenous land users will increase within and surrounding the ungulate effects assessment Local Study Area (Rempel et al., 1997; Bowman et al., 2010; Brown et al., 2018). As a result, moose within the moose effects assessment Regional Study Area may be adversely affected by improved public access if this leads to increased hunting pressures (legal and illegal) on moose. Several

Moose are an important food source for many Indigenous communities throughout northern Ontario (LeBlanc et al., 2011; Popp et al., 2019; Priadka et al., 2022). There is no mandatory or voluntary reporting of Indigenous moose harvest, and so regional harvest levels by Indigenous hunters are uncertain. However, moose are known to be harvested and relied on as a food source by the Marten Falls First Nation and other Indigenous communities within the moose effects assessment Regional Study Area. Improved access and hunting opportunities within and surrounding the ungulate effects assessment Local Study Area is likely to result in an increase in Indigenous moose harvest, particularly in Wildlife Management Unit 17, where improved access will be greatest and the largest extent of existing high suitability habitat for moose occurs in the region (**Figure 9.4-14**). However, the magnitude of increase in Indigenous hunting that may occur due to the Project is largely unknown, particularly because current harvest levels in the region by Indigenous hunters are unknown under existing conditions.

Management of non-Indigenous hunter harvest of moose is governed by the Ontario Ministry of Natural Resources (Government of Ontario, 2025f). Applications for moose hunting tags generally remain below the annual number of tags allocated per year in Wildlife Management Units 17 and 1D by the Ontario Ministry of Natural Resources (Government of Ontario, 2025f). Increased human presence from improved access due to the Project could lead to an increase in the number applications for moose hunting

tags and successful moose harvest by non-Indigenous hunters relative to existing conditions. However, the magnitude of increase in non-Indigenous hunter harvest that will result due to the Project is largely unknown. If hunter harvest pressure by Indigenous and non-Indigenous hunters increases in response to improved access to the area, moose mortality from hunter harvest is expected to increase, which could lead to reduced moose survival and reproduction in the moose effects assessment Regional Study Area. Overharvest of moose has been identified as a variable that can influence fluctuations in moose populations (Brown, 2011; Boyce et al., 2012; Popp et al., 2019).

Increased access into the region from created roads and increased knowledge of the region due to the influx of workers and owner / operators may also increase illegal hunting of moose and other encounters between wildlife and humans that could disturb moose. However, there is uncertainty in the amount of illegal harvest occurring in the moose effect assessment Regional Study Area under existing conditions, and the extent that illegal harvest may increase due to the Project. Sensory disturbances associated with increased public use (for example, noise, smells) and hunter densities could result in habitat avoidance by moose in the ungulate effects assessment Local Study Area during construction.

Overall, the Project is expected to improve public access into the ungulate effects assessment Local Study Area during construction, which may lead to increased moose mortality from elevated hunting pressure, and ultimately could affect the survival and reproduction of the regional moose population.

9.4.5.3.21.2 Mitigation and Enhancement Measures

Mitigations outlined in **Section 9.4.5.3.11** will be implemented to minimize effects from increased public access on moose survival and reproduction in the ungulate effects assessment Local Study Area during construction.

The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.5.3.21.3 Predicted Residual Effects

The Project is expected to result in a measurable increase in public access and hunting opportunities for Indigenous and non-Indigenous hunters in the ungulate effects assessment Local Study Area throughout the lifetime of the Project, but particularly during operations when public vehicle use along the Community Access Road is permitted. As a result, moose mortality risk from hunter harvest is likely to increase, particularly for moose in Wildlife Management Unit 17 with home ranges near the

Community Access Road (in other words, local to regional effect). However, the magnitude of increase in Indigenous and non-Indigenous moose hunter harvest that will occur due to the Project is largely unknown. This is because current harvest levels by Indigenous hunters in the region are unknown as there is no mandatory or voluntary reporting of Indigenous moose harvest, and adaptive management of non-Indigenous moose harvest by the government is not a mitigation measure for effects from the Project and there is uncertainty if an increase in non-Indigenous hunting pressure will be managed at sustainable levels.

As such, changes to moose survival and reproduction from increased public access due to the during construction are anticipated to have a net residual effect and is carried forward to the residual effects characterization.

During construction, effects on moose survival and reproduction from increased human access would be felt continuously, are considered unlikely to occur, and would be confined to the ungulate effects assessment Local Study Area (local effect). Effects on moose are expected to be negative, long-term, and irreversible during construction. Effects from an increase in public access on the ability of the regional moose population to remain self-sustaining and ecologically effective are anticipated to be negligible in magnitude during construction.

9.4.5.3.22 Changes to Moose from Collision with Vehicles and Equipment

9.4.5.3.22.1 Potential Effects

Survival and Reproduction

During construction, there is potential for moose mortalities to occur from vehicle and equipment collisions with moose. However, only Project vehicles and equipment will be permitted within the effects assessment Construction Disturbance Area and will be required to follow speed restrictions and safe driving practices (as described further under Mitigations and Enhancement Measures). Therefore, moose mortalities due to Project vehicle or equipment collisions may occur during construction but are less likely to occur compared to Operations when public transportation on the Community Access Road will be permitted.

9.4.5.3.22.2 Mitigation and Enhancement Measures

Mitigations outlined in **Section 9.4.5.3.11** will be implemented to minimize effects from collisions with vehicles and equipment on moose survival and reproduction in the ungulate effects assessment Local Study Area during construction.

The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.5.3.22.3 Predicted Residual Effects

Implementation of mitigation is predicted to limit moose (and other wildlife) mortality from collisions with vehicles and equipment during construction. Considering that the potential increase in moose-vehicle collisions will be restricted to Project roads, particularly the Community Access Road, a decrease in survival and reproduction is predicted to be limited to moose with home ranges that overlap the effects assessment Construction Disturbance Area. Therefore, most of the effect on the moose population from collisions with vehicles is predicted to occur within the ungulate effects assessment Local Study Area with little to no measurable change at the scale of the moose effects assessment Regional Study Area.

As such, changes to moose survival and reproduction from moose-vehicle collisions during construction are anticipated to have a net residual effect and is carried forward to the residual effects characterization.

Effects will be long-term and irreversible (permanent), will be felt continuously, and are expected to be confined to the ungulate effects assessment Local Study Area (local effect). Effects from an increase in collision with vehicles on the ability of the regional moose population to remain self-sustaining and ecologically effective are anticipated to be negligible during construction (due to effective implementation of mitigation measures). If monitoring indicates that vehicle-related mortality may be strongly influencing moose populations, then additional mitigation measures will be evaluated and implemented.

9.4.5.4 Residual Effects – Operations Phase

9.4.5.4.1 Changes to Boreal Caribou and Moose from Introduction and Spread of Invasive Plant Species

9.4.5.4.1.1 Potential Effects

Habitat Availability and Distribution

During the Operations, regular vehicle traffic on the road could transport invasive plant seeds or plant parts into the ungulate effects assessment Local Study Area. If invasive plant species are introduced and spread within the effects assessment Construction Disturbance Area, this could degrade the quality of habitats used by caribou and moose (for example, suitable foraging habitat).

9.4.5.4.1.2 Mitigation and Enhancement Measures

Habitat Availability and Distribution

As per the Ministry of Transportation's Weed Control Maintenance Best Practice (MBP-320), invasive plant species in the effects assessment Construction Disturbance Area will be controlled using a combination of biological, cultural, manual, and mechanical control methods during operations (Ontario Ministry of Transportation, 2003). Herbicides (and pesticides) will not be used during maintenance.

A list of mitigation measures to control weeds is provided in the Vegetation Technical Support Document (**Appendix J**) and the Peatlands Technical Support Document (**Appendix I**).

9.4.5.4.1.3 Predicted Residual Effects

During Operations, invasive species may occasionally be introduced within the effects assessment Construction Disturbance Area. Best management practices and the mitigation measures for controlling the spread of invasive species that will be implemented during construction are well understood and the methods have been demonstrated to be effective. The introduction of invasive plants may be higher during operations due to public use of the effects assessment Construction Disturbance Area. As such, the Project is predicted to have a net residual effect on ungulate habitat availability and distribution from the potential introduction of invasive plants during operations, and this interaction was carried forward to the residual effects characterization.

After implementation of mitigation, effects from the introduction of invasive plants during operations are predicted to be reversible over the long term and confined to the effects assessment Construction Disturbance Area. Effects from the introduction of invasive plants on the ability of caribou and moose populations in the respective effects assessment Regional Study Areas to remain self-sustaining and ecologically functional are anticipated to be negative and negligible in magnitude.

9.4.5.4.2 Changes to Boreal Caribou and Moose from Emissions of Criteria Air Contaminants

9.4.5.4.2.1 Potential Effects

Habitat Availability and Distribution

During Operations, emissions would be generated mainly from the use of fossil fuels associated with vehicles on the Community Access Road (Project and public use) and road maintenance (general, seasonal, and special maintenance). During Operations, air

criteria contaminants were predicted to be below Canadian Ambient Air Quality Standards and / or Ontario Ambient Air Quality Criteria thresholds (Atmospheric Environment Technical Support Document - Volume 1: Air Quality; **Appendix S**).

9.4.5.4.2.2 Mitigation and Enhancement Measures

A Project-specific environmental monitoring program will be developed and will contain mitigation measures to control dust and air emissions during Maintenance. A comprehensive list of mitigation measures that will be implemented to limit air particulate emissions during operations is provided in the Atmospheric Environment Technical Support Document - Volume 1: Air Quality (**Appendix S**).

9.4.5.4.2.3 Predicted Residual Effects

As discussed in the Vegetation Technical Support Document (**Appendix J**) and the Peatlands (**Appendix I**), emissions of criteria air contaminants are anticipated to have negligible, possible effects on vegetation ecosystems, and, ultimately, ungulate habitat. As such, this interaction was determined to have no residual effects on ungulate habitat availability and distribution and is not carried forward in the assessment.

9.4.5.4.3 Changes to Boreal Caribou and Moose from Fugitive Dust Emissions

9.4.5.4.3.1 Potential Effects

Habitat Availability and Distribution

Fugitive dust emissions are expected to be produced by traffic on the Community Access Road during operations. Accumulation of airborne dust produced from the Project may result in local and direct changes to ungulate habitat as described in the Construction section above.

During Operations, threshold exceedances for the Project are predicted for particulate matter less than 2.5 micrometres, particulate matter less than 10 micrometres and total suspended particulate. The particulate matter less than 2.5 micrometres levels are predicted to reach the 24-hour and annual criteria thresholds at 115 metres and 134 metres from the road, respectively (Atmospheric Environment Technical Support Document - Volume 1: Air Quality; **Appendix S**). Levels of particulate matter less than 10 micrometres are predicted to reach the 24-hour threshold at 1,986 metres from the road. Emissions of total suspended particulate are predicted to reach the 24-hour and annual thresholds at 3,004 metres and 899 metres from the road, respectively.

9.4.5.4.3.2 Mitigation and Enhancement Measures

Habitat Availability and Distribution

A Project-specific environmental monitoring program will be developed and will contain mitigation measures to control dust and air emissions during operations. A list of mitigation measures that will be implemented to limit dust deposition during operations is provided in the Atmospheric Environment Technical Support Document - Volume 1: Air Quality (**Appendix S**).

9.4.5.4.3.3 Predicted Residual Effects

Effects on caribou and moose habitat availability and distribution from fugitive dust emissions are predicted to be larger during operations because mitigations to limit dust emissions are predicted to be more effective during construction than during operations.

Dust deposition, particularly during operations, is predicted to result in negligible but certain changes to vegetation quality in the effects assessment Local Study Area (Vegetation Technical Support Document [WSP, 2026b]; Peatlands Technical Support Document [WSP, 2026c]). As such, there is a predicted net residual effect on caribou and moose habitat availability and distribution from Operations. The residual effects from fugitive dust emissions were carried forward into the residual effects assessment characterization.

Effects from dust emissions during operations are predicted to be certain, irreversible, continuous, and confined to the ungulate effects assessment Local Study Area. Effects from dust emissions on the ability of the ungulate populations in the caribou and moose effects assessment Regional Study Areas to remain self-sustaining and ecologically functional are anticipated to be negative and negligible in magnitude.

9.4.5.4.4 Changes to Boreal Caribou and Moose from Erosion and Sedimentation

9.4.5.4.4.1 Potential Effects

Habitat Availability and Distribution

Erosion and release of sediments in watercourses and adjacent terrestrial habitat may also occur during Operations. Large precipitation events may lead to run-off from the road and sedimentation in low lying areas such as wetland and riparian habitats. Similar to construction, the effects would be localized, intermittent and vary.

9.4.5.4.4.2 Mitigation and Enhancement Measures

An environmental monitoring program will be developed and implemented during Maintenance and will contain mitigation measures to control erosion and sedimentation. Erosion and sediment control measures will be developed and implemented in accordance with Ontario Provincial Standard Specifications for erosion and sediment control measures (Ministry of Transportation, 2021a, 2021c) during Maintenance. Additionally, mitigation identified in the Ministry of Transportation's Maintenance Quality Standards and Maintenance Best Practices for highway maintenance (Ministry of Transportation, 2003) will be implemented to minimize erosion and sedimentation during operations. The mitigation measures established and refined using adaptive management during construction should be maintained during operations.

A list of mitigation measures that will be implemented during operations is provided in Vegetation Technical Support Document (**Appendix J**) and Surface Water Technical Support Document (**Appendix F**).

9.4.5.4.4.3 Predicted Residual Effects

Environmental protection and monitoring plans developed for Operations are expected to limit erosion and sedimentation. After implementing mitigation, the Project is not predicted to result in residual effects on the condition of peatland, upland, wetland and riparian ecosystems (in other words, ungulate habitat), relative to existing conditions (Vegetation Technical Support Document [**Appendix J**]). As such, this interaction was not carried forward in the assessment.

9.4.5.4.5 Changes to Boreal Caribou and Moose from Changes in Surface Water Quantity

9.4.5.4.5.1 Potential Effects

Habitat Availability and Distribution

Removal of forested and peatland habitat during construction, and subsequent conversion of treed and peatland habitats to open or shrubby habitats could result in changes to surface water quantity during operations of the Project (Surface Water Technical Support Document [**Appendix F**]). Potential effects from changes to surface water quantity on caribou and moose habitat availability and distribution are discussed in the Construction section, above.

9.4.5.4.5.2 Mitigation and Enhancement Measures

Habitat Availability and Distribution

The mitigation measures established and refined using adaptive management during Project Construction should be maintained during Operations. Follow Ontario Provincial Standard Specification 411 and regularly inspect and maintain culverts and bridges. Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, Fisheries and Oceans Canada, and Ontario Ministry of Natural Resources, will be followed during operations.

A comprehensive list of mitigation measures to limit changes to surface water quantity during operations is provided in the Surface Water Technical Support Document (**Appendix F**).

9.4.5.4.5.3 Predicted Residual Effects

As discussed in the Surface Water Technical Support Document (**Appendix F**), Operations could result in small, localized changes to surface water quantity. After implementing mitigation, changes to surface water quantity are anticipated to be of negligible magnitude. As such, no net residual effects on caribou and moose habitat availability and distribution are predicted and this interaction was not carried forward in the assessment.

9.4.5.4.6 Changes to Boreal Caribou and Moose from Changes in Surface Water Quality

9.4.5.4.6.1 Potential Effects

Habitat Availability and Distribution

During Operations, mechanical vegetation maintenance activities along the right-of-way could result in changes to surface water quality. For example, organic debris may be transported to nearby waterbodies, which could increase concentrations of suspended solids in the receiving water (Surface Water Technical Support Document; **Appendix F**).

9.4.5.4.6.2 Mitigation and Enhancement Measures

Habitat Availability and Distribution

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, Fisheries and Oceans Canada, and Ontario Ministry of Natural Resources, will be followed during operations. During the

winter periods, sand will be used on the Community Access Road for de-icing instead of road salt. Herbicides (and pesticides) will not be used during Operations.

9.4.5.4.6.3 Predicted Residual Effects

As described in Surface Water Technical Support Document (**Appendix F**), the Operations of the Project is predicted to result in changes to surface water quality that are negligible in magnitude. As such, no net residual effects on ungulate habitat availability and distribution are predicted and this interaction is not carried forward into the assessment.

9.4.5.4.7 Changes to Boreal Caribou and Moose from Changes to Groundwater

9.4.5.4.7.1 Potential Effects

Habitat Availability and Distribution

Effects from changes to groundwater levels on caribou and moose habitat availability and distribution from the potential settlement of the road base structure and underlying peat material, and from potential sediment accumulation in the road base material restricting the flow of groundwater, may continue through Operations.

9.4.5.4.7.2 Mitigation and Enhancement Measures

The mitigation measures established and refined using adaptive management during construction should be maintained during operations. Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks, Fisheries and Oceans Canada, and Ontario Ministry of Natural Resources, will be followed during operations.

As discussed in the Groundwater Technical Support Document (**Appendix H**), the mitigation measures established and refined using adaptive management during construction should be maintained during Operations. It is expected that a robust monitoring program will be undertaken, and adaptive management measures implemented, as required. This monitoring program is described in more detail in the Peatlands Technical Support Document (**Appendix I**).

9.4.5.4.7.3 Predicted Residual Effects

With the implementation of mitigation measures, changes to groundwater regimes will be minimized and impacts on retained vegetation communities and ungulate habitat availability and distribution should be minimal. However, there are still anticipated to be

measurable changes to vegetation due to change to groundwater quantity, which are predicted to result in a residual effect on caribou and moose habitat availability and distribution. As such, this interaction is carried forward to the residual effects characterization.

Effects from changes to groundwater quantity are predicted to be probable, irreversible (long term), continuous, and confined to the effects assessment Local Study Area. Effects from changes to groundwater quantity on the ability of the caribou and moose populations in the effects assessment Regional Study Area to remain self-sustaining and ecologically effective are anticipated to be negative but negligible in magnitude.

9.4.5.4.8 Changes to Boreal Caribou and Moose from Increase in Wildlife Attractants

9.4.5.4.8.1 Potential Effects

Survival and Reproduction

Wildlife may be attracted to food smells and waste, petroleum-based chemicals, and roadkill during Operations. However, the potential of attracting wildlife from food wastes, petroleum products, and gray water and sewage is expected to decrease during Operations once the temporary construction camps are decommissioned.

9.4.5.4.8.2 Mitigation and Enhancement Measures

Survival and Reproduction

The mitigation measures established and refined using adaptive management during construction should be maintained during Operations at staging areas. In addition, during Operations, inspections of the road and rest areas will occur two days of each week and, based on these inspections, debris and litter will be collected when detected (Ministry of Transportation, 2003). Additionally, Ontario Department of Highways will remove roadkill when reported by drivers on the highway or when observed during the two-time-per-week highway inspections (Ministry of Transportation, 2003). As per the Ministry of Transportation's Debris Control Maintenance Quality Standard (MQS-331), debris less than 1 metres in diameter, including roadkill, will be removed within 48 hours; debris greater than 1 metres in diameter will be removed as detected (Ministry of Transportation, 2003). Generally, roadkill will be removed from the effects assessment Construction Disturbance Area and relocated to adjacent brush areas, as per the Waste and Excess Materials Management Environmental Protection (EP-9) requirements in the Ministry of Transportation's Maintenance Manual (Ministry of Transportation, 2003). As per the Waste and Excess Materials Management Environmental Protection requirements in the Maintenance Manual, depending on the location and weather at the

time of roadkill removal, burial of small mammals occur in the roadside ditches, if this activity is permitted under a Certificate of Approval for Waste Management System (Ministry of Transportation, 2003).

Rest areas will be available every 50 kilometres along the road during operations. The rest areas will be staggered every 25 kilometres, alternating on each side of the highway. These rest areas will contain waste receptacles. As per the Ministry of Transportation's Rest Area / Picnic Site Maintenance Best Practice (MBP-325), during the rest areas operating season (in other words, months during the year when temperatures remain above 0°C and closing no sooner than October 15), litter in waste receptacles will be removed from rest areas when waste receptacles are 75 percent full (Ministry of Transportation, 2003).

During the winter periods of Operations, sand will be used on the Community Access Road for de-icing instead of road salt, if required.

9.4.5.4.8.3 Predicted Residual Effects

The implementation of mitigation measures described above, including effective waste management practices and avoidance of de-icing salt use, are expected to limit the attraction of ungulates and their predators to the effects assessment Construction Disturbance Area during operations. However, attraction to the Project could still occur. As such, the Project is expected to result in a net residual effect on caribou and moose survival and reproduction. This interaction was carried forward into the residual effects characterization.

Effects from changes to groundwater quantity are predicted to be probable, irreversible (long term), continuous, and confined to the effects assessment Local Study Area. Effects from changes to groundwater quantity on the ability of the caribou and moose populations in the effects assessment Regional Study Area to remain self-sustaining and ecologically effective are anticipated to be negative but negligible in magnitude.

9.4.5.4.9 Changes to Boreal Caribou and Moose from Blasting and Associated Fly Rock

9.4.5.4.9.1 Potential Effects

Survival and Reproduction

Explosives may be used at quarry sites to excavate materials to be used for maintenance of the Community Access Road. Blasting activities may produce fly rock that has the potential to strike ungulates in the vicinity and cause injury or death. The risk of mortality from being struck by fly rock would be greatest for ungulates who

occupy territories that overlap blasting sites. Blasting will be infrequent during Operations, and the risk of mortality to wildlife from fly rock is anticipated to be much lower during operations.

The potential effects on ungulates from the sensory disturbances associated with blasting during Operations are addressed separately under Sensory Disturbance.

9.4.5.4.9.2 Mitigation and Enhancement Measures

Survival and Reproduction

The mitigation measures established and refined using adaptive management during construction should be maintained during operations. An environmental monitoring program will be implemented during Maintenance and will include policies and actions for avoiding and minimizing the risks of blasting and blasting materials to wildlife. During Operations, quarry blasting will be suspended within 10 kilometres of known or potential High Use Areas for caribou during sensitive seasons (nursery areas: May 1 to July 14 very low tolerance, July 15 to September 15 low tolerance; winter use areas: December 1 to March 31; Ministry of Natural Resources 2013b, 2013c).

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during operations.

9.4.5.4.9.3 Predicted Residual Effects

Due to the infrequent timing of blasting, and with the implementation of mitigation, blasting and fly rock from the Project during operations is not expected to result in injury or mortality of caribou or moose. There is no net effect predicted for this Project–environment interaction on ungulate survival and reproduction. Therefore, this interaction was not carried forward in the assessment.

9.4.5.4.10 Changes to Boreal Caribou and Moose from Chemical or Hazardous Material Spills

9.4.5.4.10.1 Potential Effects

Survival and Reproduction

There is the potential for accidental spills of fuels and other materials from vehicles and vehicle collisions during road usage during Operations from malfunctions of equipment or spills during equipment or vehicle refuelling during Maintenance activities. Effects

from spills on water, soil, and vegetation quality during operations are the same as discussed in Construction.

9.4.5.4.10.2 Mitigation and Enhancement Measures

Survival and Reproduction

The mitigation measures established and refined using adaptive management during construction should be maintained during Maintenance. During Operations mitigation measures will include a posting and enforcement of a speed limit on the highway, which should reduce potential for chemical or hazardous material spills by reducing vehicle collision risk. Meet the *Transportation of Dangerous Goods Act*, Ontario Dangerous Goods Handling and Transportation Act, and the Ontario *Environmental Protection Act* for the transport, storage, and handling of fuels required for Maintenance. Also, commercial vehicles who are transporting dangerous goods on the Community Access Road should be adhering to the federal *Transportation of Dangerous Goods Act* and Ontario's Dangerous Goods Handling and Transportation Act.

9.4.5.4.10.3 Predicted Residual Effects

As discussed in the Surface Water Technical Support Document (**Appendix F**), Groundwater Technical Support Document (**Appendix H**), Physiography, Terrain, and Soils Technical Support Document (**Appendix N**), and Vegetation Technical Support Document (**Appendix J**), there are predicted to be no residual effects from chemical or hazardous material spills on surface water quality, groundwater, soil, or vegetation quality during Operations. As such, there was predicted to be no net effect on ungulate survival and reproduction, relative to existing conditions. Therefore, the potential effects of chemical or hazardous material spills were not carried forward in the assessment.

9.4.5.4.11 Changes to Boreal Caribou from Habitat Loss and Habitat Alteration

9.4.5.4.11.1 Potential Effects

Habitat Availability, Distribution, Survival and Reproduction

Although habitat will be initially removed during construction, the effects on caribou habitat availability from habitat loss will continue through Operations of the Project (in other words, closure and reclamation of the road is not anticipated).

Although habitat will be initially removed during construction, the effects on caribou habitat distribution from habitat loss and alteration will continue through Operations of the Project (in other words, closure and reclamation of the road is not anticipated).

Although habitat will be initially removed during construction, the effects on caribou survival and reproduction from habitat loss and alteration will continue through Operations of the Project (in other words, closure and reclamation of the road is not anticipated).

9.4.5.4.11.2 Mitigation and Enhancement Measures

Habitat Availability, Distribution and Survival and Reproduction

During Operations, ongoing use of inactive areas will be prevented through combined use of physical control measures (rollback, remove of creek crossings, recontouring to surrounding topography, revegetation / reforesting and / or barriers at junctions with active access). Marten Falls First Nation continues to engage in discussions with the Province regarding the ownership and future operations and maintenance of the Community Access Road. Access and ownership including gating security / ID system, will require further dialogue between the communities and the Province.

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during operations. Additionally, a Preliminary Biodiversity Offset Plan is being developed to achieve no net loss of caribou habitat. Over the long term, measures undertaken as part of the Preliminary Biodiversity Offset Plan would be implemented to achieve a net increase in functional caribou habitat. However, because there is uncertainty in the effectiveness and timing of offset measures in the Biodiversity Offset Plan, offsetting has not been considered in the conclusion of predicted residual effects below.

The effectiveness of mitigation measures will be evaluated during Operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.5.4.11.3 Predicted Residual Effects

The implementation of mitigation measures described above are expected to limit negative effects from habitat loss and alteration on caribou in the caribou effects assessment Regional Study Area. Direct habitat loss will occur during construction and will be confined to the effects assessment Construction Disturbance Area; indirect habitat loss will also occur within a 500 metre buffer around the effects assessment Construction Disturbance Area. The direct and indirect habitat loss that occurs during construction will be permanent and continuous for the duration of the Operations Phase of the Project.

Caribou occupying the caribou effects assessment Regional Study Area and in the Missisa range will still have an amount of undisturbed habitat that remains above the disturbance thresholds established for a self-sustaining and ecologically functional population. However, 15,047 hectares of nursery areas and 10,769 hectares of winter use areas will be removed by the Project, primarily in the Missisa range. The amount of disturbance in the Nipigon range in the existing conditions exceeds the 35 percent threshold, and the addition of the Project is predicted to increase the level of total disturbance (natural and anthropogenic combined) by approximately 0.5 percent, from 45.75 percent to 45.83 percent.

After mitigation, the Project is expected to result in a net residual effect on caribou habitat availability and distribution and survival and reproduction from habitat loss and alteration during operations. Therefore, this interaction was carried forward in the assessment.

The effects on caribou will be continuous and vary from the ungulate effects assessment Local Study Area to the caribou effects assessment Regional Study Area (for winter use and nursery areas) to beyond regional (for movement and connectivity). Some individuals that were collared in the ungulate effects assessment Local Study Area demonstrated seasonal travel east to the James Bay range and north to the Far North / eastern migratory range. The number of individuals in the population(s) who use these extended travel corridors, and the regularity of these long-distance movements, is uncertain.

Effects from habitat loss and alteration on the ability of the caribou populations in the caribou effects assessment Regional Study Area to remain self-sustaining and ecologically functional are anticipated to be negative and of low magnitude for the Missisa range and moderate magnitude for the Nipigon range.

9.4.5.4.12 Changes to Boreal Caribou from Sensory Disturbance

9.4.5.4.12.1 Potential Effects

Habitat Availability and Distribution

During operations, sensory disturbance will mostly be produced by road use and maintenance activities. During Operations, an Average Annual Daily Traffic of 700 vehicles on the north-south section and 100 vehicles on the east-west section is anticipated by 2046. An estimated 64 percent of the traffic on the north-south segment and 3 percent of the traffic on the east-west segment of the Community Access Road is anticipated to be heavy trucks (in other words, vehicles with three or more axles designed for transportation of cargo), which will create more sensory disturbance than

light-duty and medium trucks used for personal and business use. No mining trucks are anticipated to use the east-west segment of the Community Access Road; however, the east-west segment may have commercial truck traffic accessing the aggregate facilities near the community for maintenance of the road. Although there may be periods with long intervals between vehicles along one location on the Community Access Road (infrequent disturbance), during other periods vehicles may be using the road through the day and night and the interval between vehicles would be relatively shorter resulting in frequent to continuous sensory disturbance.

As a result, sensory disturbances during Operations are certain, have the potential to negatively affect caribou distribution, movement and habitat connectivity in the ungulate effects assessment Local Study Area, and are assumed to occur continuously.

Survival and Reproduction

Although sensory disturbance will initially occur during construction, the effects on caribou survival and reproduction will continue through operations (in other words, closure and reclamation of the road is not anticipated). Sensory disturbances are predicted to decrease during operations compared to during construction.

9.4.5.4.12.2 Mitigation and Enhancement Measures

Mitigations outlined will be implemented to minimize effects from sensory disturbance on caribou habitat availability, distribution, and survival and reproduction in the ungulate effects assessment Local Study Area during operations. The effectiveness of mitigation measures will be evaluated during Operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

During Operations, work will be completed as quickly as possible to reduce the duration of disturbance associated with maintenance activities. The Environmental Protection Plan will be implemented to minimize sensory disturbance by owner / operators, including prohibiting use of engine retarder brakes, enforcing speed limits, and restricting maintenance traffic to designated areas. Ongoing use of inactive areas will be prevented through combined use of physical control measures (rollback, remove of creek crossings, recontouring to surrounding topography, revegetation / reforesting and / or barriers at junctions with active access). Aerial operations will be limited when possible; when not feasible, minimum ferry altitude of 400 metres above ground level will be maintained during sensitive timing periods to reduce sensory disturbance on caribou.

Mitigations to reduce sensory disturbance by the general public during Operations are difficult to enforce; however, speed limits may reduce noise associated with vehicle

traffic. Owner / operators employed to conduct maintenance activities will follow the same mitigations as outlined for construction.

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during Operations.

Additionally, a Preliminary Biodiversity Offset Plan (**Appendix AB**) has been developed to achieve no net loss of caribou habitat. Over the long term, measures undertaken as part of the Preliminary Biodiversity Offset Plan would be implemented to achieve a net increase in functional caribou habitat. However, because there is uncertainty in the effectiveness and timing of offset measures in the Preliminary Biodiversity Offset Plan, offsetting has not been considered in the conclusion of predicted residual effects below.

9.4.5.4.12.3 Predicted Residual Effects

The implementation of mitigation measures is expected to limit negative effects from sensory disturbance in the ungulate effects assessment Local Study Area, but sensory disturbance is predicted to reduce the quality of caribou habitat by causing avoidance and increased movements away from the effects assessment Construction Disturbance Area. After mitigation, the Project is expected to result in a net residual effect on caribou habitat availability and distribution and survival and reproduction from sensory disturbance during Operations. Therefore, this interaction is carried forward in the assessment.

Effects on habitat availability, distribution and survival and reproduction of Boreal caribou from sensory disturbance during Operations are predicted to be certain, irreversible, and continuous. Effects will be confined to the ungulate effects assessment Local Study Area (for habitat availability and survival and reproduction) and extend to the caribou effects assessment Regional Study Area for habitat distribution (because of the effect on connectivity). Effects from sensory disturbance on the ability of the caribou populations in the caribou effects assessment Regional Study Area to remain self-sustaining and ecologically functional are anticipated to be negative and low in magnitude.

9.4.5.4.13 Changes to Boreal Caribou from Linear Barriers

9.4.5.4.13.1 Potential Effects

Habitat Availability and Distribution

Although linear barriers are initially created during construction, the effects on caribou habitat availability and distribution from linear barriers will continue through Operations of the Project (in other words, closure and reclamation of the road is not anticipated).

The initial response of caribou to roads is avoidance, but over time caribou may become habituated to the presence of road and traffic depending on the intensity of activity, noise and traffic volume (Schindler et al., 2007; Vistnes and Nellemann, 2008; Polfus et al., 2011; Leblond et al., 2013; Haskell and Ballard, 2008; Johnson and Russell, 2014; Smith and Johnson, 2023). During Operations, an Average Annual Daily Traffic volume of 700 vehicles is expected on the north-south section of the Community Access Road and an Average Annual Daily Traffic volume of 100 vehicles is expected on the east-west section of the Community Access Road by 2046 (**Appendix W**).

Survival and Reproduction

Although linear barriers are initially created during construction, the effects on caribou survival and reproduction from linear barriers will continue through Operations of the Project (such as, closure and reclamation of the road is not anticipated).

9.4.5.4.13.2 Mitigation and Enhancement Measures

Mitigations will be implemented to minimize effects from linear barriers on caribou habitat availability, distribution, and survival and reproduction in the ungulate effects assessment Local Study Area during Operations. The effectiveness of mitigation measures will be evaluated during operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

During Operations of the Project, gaps will be maintained in road berms and snowbanks to facilitate wildlife crossing at drainages, wildlife trails, strategic crossing points informed by movement data and Indigenous Knowledge, or connected habitat patches so that caribou movements across roads are not blocked. Snowbanks will be limited as much as possible and to a height of less than 1.6 metres. Snow clearing along the access roads will incorporate road pull-outs at regular intervals to provide refuge for wildlife moving along the Community Access Road corridor. Posted traffic speeds will be enforced.

Modified traffic patterns and road closures are common mitigations to reduce the effects of linear barriers associated with operation of winter use industry roads and mine roads,

but are not feasible mitigations to implement during operations of a Community Access Road.

9.4.5.4.13.3 Predicted Residual Effects

The implementation of mitigation measures is expected to limit negative effects from linear barriers in the ungulate effects assessment Local Study Area and caribou effects assessment Regional Study Area. However, the addition of a new permanent road is predicted to result in alteration of caribou movement patterns and reduce the quality of caribou habitat by causing avoidance of the Construction Disturbance Area, particularly for caribou that move between the Missisa and Ozshiki ranges and Missisa and Nipigon ranges.

After mitigation, the Project is expected to result in a net residual effect on caribou habitat availability and distribution and survival and reproduction from linear barriers during Operations. Therefore, this interaction was carried forward in the assessment.

Effects on habitat availability, distribution, and survival and reproduction of Boreal caribou from increased linear barriers during construction and operations are predicted to be continuous and probable. Effects will be local for habitat availability and regional to beyond regional for habitat distribution and survival and reproduction. During Operations, when temporary access roads are revegetated, the effects will be long term and reversible for those revegetated access roads and long term and irreversible for the Community Access Road and permanent access roads. Effects from linear barriers on the ability of the caribou populations in the caribou effects assessment Regional Study Area to remain self-sustaining and ecologically functional are anticipated to be negative and high in magnitude.

9.4.5.4.14 Changes to Boreal Caribou from Increased Predator Access

9.4.5.4.14.1 Potential Effects

Survival and Reproduction

Although increased predation risk will initially occur during construction, the effects on caribou survival and reproduction will continue through Operations of the Project (in other words, closure and reclamation of the road is not anticipated).

9.4.5.4.14.2 Mitigation and Enhancement Measures

Mitigations outlined will be implemented to minimize effects from increased predator access on caribou survival and reproduction in the ungulate effects assessment Local Study Area during Operations. The effectiveness of mitigation measures will be

evaluated during Operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

To minimize ongoing attraction of predators to the Project area, de-icing salts will not be used on the unpaved Community Access Road, road kill will be cleaned up following best management practices outlined by Ontario's Ministry of Transportation and wildlife access to waste will be restricted. The ongoing use of inactive areas by predators will be minimized through physical control measures such as rollback, removal of creek crossings, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access.

9.4.5.4.14.3 Predicted Residual Effects

Implementing the mitigation measures described above is expected to limit the negative effects from increased predation risk to caribou due to the increase in linear features. The largest risk to caribou would likely occur during Operations when predators are more likely to use the decommissioned access roads for travel (in other words, forage) may attract moose. However, it is uncertain how frequently predators would use the access roads and Community Access Road, and the level of increase in encounter rates that would occur (effect is likely). The effect is expected to be stronger in the southern portion of the study areas during the early stages of regeneration and weaken as the vegetation transitions into mature forest and becomes less quality forage for moose.

Considering the potential increase in predator encounters will be restricted to Project roads and adjacent habitat, an increase in predation risk is predicted to be limited to caribou with home ranges that overlap the ungulate effects assessment Local Study Area. Most of the effect on the caribou population from increased predator access is predicted to occur within the ungulate effects assessment Local Study Area with little to no measurable change at the scale of the caribou effects assessment Regional Study Area.

After mitigation, the Project is expected to result in a net residual effect on caribou survival and reproduction from increased predator access during construction and operations. Therefore, this interaction was carried forward in the assessment.

Effects on reproduction and survival of Boreal caribou from increased predator access are predicted to be probable, continuous, and confined to the ungulate effects assessment Local Study Area. During Operations, when temporary access roads are revegetated, the effects will be long term and reversible for those revegetated access roads and long term and irreversible for the Community Access Road and permanent access roads. Effects from increased predation on the ability of the caribou populations

in the caribou effects assessment Regional Study Area to remain self-sustaining and ecologically functional are anticipated to be negative and negligible in magnitude.

9.4.5.4.15 Changes to Boreal Caribou from Increase in Public Access

9.4.5.4.15.1 Potential Effects

Survival and Reproduction

Although increase in public access will initially occur during construction, the effects on caribou survival and reproduction will continue through Operations of the Project (in other words, closure and reclamation of the road is not anticipated). The effects will be stronger during operations when there are more people using the road.

9.4.5.4.15.2 Mitigation and Enhancement Measures

Mitigations outlined will be implemented to minimize effects from increased public access on caribou survival and reproduction in the ungulate effects assessment Local Study Area during Operations. The effectiveness of mitigation measures will be evaluated during Operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

During Operations, the Community Access Road will be accessible to the public but access roads for aggregate areas and other infrastructure required for Employees will be prohibited from hunting or carrying firearms while conducting Maintenance activities. Marten Falls First Nation continues to engage in discussions with the Province regarding the ownership and future operations of the Community Access Road. Access and ownership including gating security / ID system, will require further dialogue between the communities and the Province.

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction and operations.

9.4.5.4.15.3 Predicted Residual Effects

The Project is expected to result in a measurable change in public access in the ungulate effects assessment Local Study Area relative to the existing environment. The increase in people in the area during the Project lifespan could result in a minor increase in illegal harvesting of animals. The largest risk to caribou would occur during operations when mitigations are more difficult to enforce.

After mitigation, the Project is expected to result in a net residual effect on caribou survival and reproduction from increased public access during construction and operations. Therefore, this interaction was carried forward in the assessment.

Effects from increases in public access are predicted to be possible during operations, irreversible, continuous, and confined to the ungulate effects assessment Local Study Area. Effects from increased hunting and poaching on the ability of the caribou populations in the caribou effects assessment Regional Study Area to remain self-sustaining and ecologically functional are anticipated to be low in magnitude during Operations.

9.4.5.4.16 Changes to Boreal Caribou from Collisions with Vehicles and Equipment

9.4.5.4.16.1 Potential Effects

Survival and Reproduction

Although increased risk of collisions with vehicles and equipment will initially occur during construction, the effects on caribou survival and reproduction will continue through Operations of the Project (in other words, closure and reclamation of the road is not anticipated).

It is expected that there will be an increase in light and all-terrain vehicles and snowmachines in addition to vehicles that transport heavy materials, equipment and fuel. During Operations, an Average Annual Daily Traffic of 700 vehicles on the north-south section and 100 vehicles on the east-west section by 2046 was conservatively estimated (**Appendix W**). An estimated 64 percent of the traffic on the north-south segment and 3 percent of the traffic on the east-west segment of the Community Access Road is anticipated to be heavy trucks (in other words, vehicles with three or more axles designed for transportation of cargo). No mining trucks are anticipated to use the east-west segment of the Community Access Road during Operations; however, the east-west segment may have commercial truck traffic accessing the aggregate facilities near the community of Marten Falls First Nation for maintenance of the Community Access Road.

Limited information is available on the anticipated day / night traffic distribution on the Community Access Road during operations, although it is reasonable to assume that traffic volume will be higher during daytime (**Appendix W**). Although there may be periods of long intervals between vehicles along one location on the Community Access Road (possible occurrence of collision), during other periods vehicles may be using the road through the day and night and the interval between vehicles would be relatively

shorter and increase the likelihood of caribou-vehicle collisions (in other words, probable).

Traffic in the effects assessment Construction Disturbance Area may result in avoidance by caribou during Operations. Avoidance of traffic by caribou would decrease the potential for injury or mortality from vehicle collisions. However, the ability of caribou to avoid or move away from the Community Access Road may be constrained during certain life-history periods or stages. Although caribou are extremely mobile, they may be adversely influenced immediately prior to and for a short period after calving when their movements are constrained. An increase in vehicles and traffic during the calving and post-calving season can increase the risk of injury or mortality to adults and their young.

9.4.5.4.16.2 Mitigation and Enhancement Measures

During Operations, the ongoing use of inactive areas by the public will be minimized through physical control measures such as rollback, removal of creek crossings, felling of timber across temporary access roads, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access. Progressive reclamation and revegetation will be implemented as non-permanent features will be decommissioned and reclaimed or revegetated naturally. This will reduce the amount of humans / vehicles on inactive roads and trails and ultimately minimize the number of collisions.

During Operations, mitigation measures applicable to non-commercial traffic will include signage in areas where wildlife are regularly observed and reduced speed limits in Category 1 caribou habitat areas. Additional mitigation for commercial traffic will include reduced speed limits on the entire road, communication of wildlife presence between drivers, and mandatory reporting of wildlife incidents. Gaps in snowbanks will be ploughed at least every 1 kilometres apart and maintained by road maintenance crews throughout the winter season. Marten Falls First Nation continues to engage in discussions with the Province regarding the ownership and future operations of the Community Access Road. Access and ownership including gating security / ID system, will require further dialogue between the communities and the Province.

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction and operations.

Additionally, a Preliminary Biodiversity Offset Plan (**Appendix AB**) has been developed to achieve no net loss of caribou habitat. Over the long term, measures undertaken as

part of the Preliminary Biodiversity Offset Plan would be implemented to achieve a net increase in functional caribou habitat. However, because there is uncertainty in the effectiveness and timing of offset measures in the Preliminary Biodiversity Offset Plan, offsetting has not been considered in the conclusion of predicted residual effects below.

The effectiveness of mitigation measures will be evaluated during construction and operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.5.4.16.3 Predicted Residual Effects

Implementation of mitigation is predicted to limit caribou (and other wildlife) mortality from collisions with vehicles and equipment during Operations. The largest risk to caribou from collisions with vehicles would occur during Operations when traffic volume is highest and there are less enforceable mitigations to implement. Considering the potential increase in caribou-vehicle collisions will be restricted to Project roads, a decrease in survival and reproduction is predicted to be limited to caribou with home ranges that overlap the ungulate effects assessment Local Study Area. The increase in mortality of caribou from vehicle collisions is predicted to be additive relative to other mortality factors and have little to no to effect on population survival and reproduction (in other words, lambda) at the scale of the caribou effects assessment Regional Study Area. If monitoring indicates that vehicle-related mortality may be strongly influencing caribou populations, then additional mitigation measures would be evaluated and implemented.

After mitigation, the Project is expected to result in a net residual effect on caribou survival and reproduction from collisions with vehicles and equipment during Operations. Therefore, this interaction was carried forward in the assessment.

Effects are predicted to be probable during operations, irreversible, continuous, and confined to the ungulate effects assessment Local Study Area. Effects from collisions with vehicles and equipment on the ability of the caribou populations in the caribou effects assessment Regional Study Areas to remain self-sustaining and ecologically functional are anticipated to be low to moderate magnitude during Operations.

9.4.5.4.17 Changes to Moose from Habitat Loss and Habitat Alteration

9.4.5.4.17.1 Potential Effects

Habitat Availability

Although habitat will be initially removed during construction, the effects on moose habitat availability from habitat loss will continue indefinitely throughout Operations of

the Project (in other words, closure and reclamation of the Community Access Road, its associated right-of-way and aggregate areas are not anticipated). An exception to this is that temporary features (for example, laydown areas, construction camps, some access roads) will be decommissioned and reclaimed or left to revegetate naturally are anticipated to provide functional moose habitat after six to ten years once low shrubs have established (Nelson et al. 2008). Reclamation is assumed to reverse the effects of land clearing; however, reclaimed habitats are expected to differ structurally from existing conditions. Reclaimed areas that are exposed to sensory disturbance associated with Operations may continue to be avoided by moose despite successful establishment of forage habitat.

Habitat Distribution

Although habitat will be initially removed and fragmented during construction, the effects on moose habitat distribution from habitat loss is expected to continue indefinitely throughout Operations of the Project (in other words, closure and reclamation of the Community Access Road and its associated right-of-way are not anticipated). As discussed above under Habitat Availability, reclamation of temporary features is expected to provide functional moose habitat after six to ten years (Nelson et al., 2008). However, temporary features are less likely to have a measurable change on moose habitat connectivity compared to the Project's permanent features. As a result, the effects from changes to moose habitat distribution and connectivity are expected to continue into Operations, despite the reclamation of temporary features.

The introduction of Project linear features also has the potential to negatively affect moose through increases in predation risk, hunter harvest pressure, and moose-vehicle collisions.

Survival and Reproduction

Although habitat will be initially removed during construction, the effects on moose survival and reproduction from habitat loss and alteration will continue through Operations of the Project (in other words, closure and reclamation of the Community Access Road and its associated right-of-way is not anticipated).

9.4.5.4.17.2 Mitigation and Enhancement Measures

Habitat Availability

Mitigation measures outlined in **Section 9.4.5.3.11** will be implemented to avoid, minimize, and restore the effects from habitat loss and alteration on moose habitat availability, distribution, and survival and reproduction in the ungulate effects assessment Local Study Area and moose effects assessment Regional Study Area

(specifically in Wildlife Management Unit 17 where a higher proportion of habitat loss and alteration will occur). Further, Marten Falls First Nation has proposed a number of mitigation measures to limit the effects on wildlife and their habitats from habitat loss and alteration, which are outlined in Marten Falls First Nation (2023).

The effectiveness of mitigation measures will be evaluated during Operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.5.4.17.3 Predicted Residual Effects

A small amount of potential quality moose habitat that will be directly and indirectly lost or altered during construction, relative to the amount available in existing conditions. Specifically, the Project is predicted to directly remove 4,462 hectares of high and moderate suitability moose habitat that overlaps the effects assessment Construction Disturbance Area. This represents a 1.2 percent and <0.1 percent decrease in high and moderate habitat in the ungulate effects assessment Local Study Area and moose effects assessment Regional Study Area, respectively. Direct habitat loss is confined to the effects assessment Construction Disturbance Area. An additional 23,812 hectares of high and moderate suitability habitat is expected to be indirectly (effectively) lost or affected within the 500 metre buffer (zone of influence) around the effects assessment Construction Disturbance Area, which represents a potential 6.3 percent and 0.2 percent decrease in high and moderate suitability habitat in the ungulate effects assessment Local Study Area and moose effects assessment Regional Study Area, respectively.

Overall, high and moderate suitability habitats are expected to decrease in availability by 7.5 percent in the ungulate effects assessment Local Study Area and 0.3 percent in the moose effects assessment Regional Study Area due to direct and indirect habitat loss or alteration associated with the Project. Therefore, a large proportion of suitable moose habitat is expected to remain undisturbed and connected in the ungulate effects assessment Local Study Area and the moose effects assessment Regional Study Area during Operations.

The implementation of mitigation measures is expected to reduce negative effects from the Project on moose habitat availability, habitat distribution, and survival and reproduction; however, effects on moose from habitat loss and alteration cannot be avoided or mitigated entirely. Therefore, a net residual effect on moose is expected during Operations from habitat loss and alteration. Residual effects from habitat loss and alteration were carried forward into characterization of residual effects.

Effects will be confined to the ungulate effects assessment Local Study Area (habitat availability, survival, and reproduction) and the moose effects assessment Regional Study Area (habitat connectivity and movement). Effects from direct habitat loss and alteration on the ability of the regional moose population to remain self-sustaining and ecologically effective are anticipated to be negative and low in magnitude.

9.4.5.4.18 Changes to Moose from Sensory Disturbance

9.4.5.4.18.1 Potential Effects

Habitat Availability and Distribution

During Operations, sensory disturbances and human activity produced by the Project will be associated with vehicle traffic on the Community Access Road, maintenance of the road, and continued use of some quarries. Sensory disturbance produced by the Project, such as noise and vibrations, are expected to decrease during operations compared to Construction.

Noise modelling indicates that vehicle traffic on the Community Access Road during operations will result in noise levels ranging from 41 to 53 A-weighted decibels at the edge of the effects assessment Construction Disturbance Area. Noise levels at 500 metres from the effects assessment Construction Disturbance Area (zone of influence) are predicted to range between 38 to 41 A-weighted decibels, which are below the daytime level of 45 A-weighted decibels that is typical of rural and remote areas, as described in the Health Canada Noise Guidance (Health Canada, 2023). In addition, ground vibrations induced by vehicle traffic during operations are predicted to be negligible beyond 25 metres of the right-of-way of the Community Access Road (Acoustic and Vibration Technical Support Document [**Appendix P**]).

The continued operation of quarries during Operations is predicted to emit noise levels between 55 to 77 A-weighted decibels at the edge of the effects assessment Construction Disturbance Area (Acoustic and Vibration Technical Support Document [**Appendix P**]). Existing vibration levels are expected to increase, on occasion, due to quarry blasting activities but blast-induced vibration will be temporary in nature, occur only during specific activities, and would be limited to the vicinity of Project quarries. As described for Construction, ground vibration from occasional quarry blasting during operations is expected to produce a short-term increase in ground vibration and air overpressure within the vicinity of a blast source (Acoustic and Vibration Technical Support Document [**Appendix P**]).

The predicted noise levels near the road and public presence during operations are still expected to affect moose habitat availability, behaviour and movement in the ungulate

effects assessment Local Study Area. As such, it is conservatively assumed that habitat within the 500 metre zone of influence around the effects assessment Construction Disturbance Area could remain indirectly (effectively) lost or degraded due to sensory disturbance during Operations, as described for Construction.

Sensory disturbance effects from vehicle traffic are expected to be felt continuously during Operations, although traffic volumes will vary temporally and spatially. Traffic volumes are expected to be greatest on the north-south section of the Community Access Road compared to the east-west section that connects to the Marten Falls First Nation community.

Changes to moose behaviour, movement, and habitat availability and distribution from sensory disturbance during operations are considered probable (in other words, effect is likely to occur) with the potential for some individuals to adapt to vehicle traffic.

Survival and Reproduction

Although sensory disturbance from the Project will initially occur during construction, the effects on moose survival and reproduction will continue through Operations of the Project (in other words, closure and reclamation of the Community Access Road is not anticipated). As described under Habitat Availability and Distribution, sensory disturbances are predicted to decrease during Operations with vehicle traffic as the primary source of sensory disturbance.

9.4.5.4.18.2 Mitigation and Enhancement Measures

Mitigations outlined in **Section 9.4.5.3.11** will be implemented to minimize effects from sensory disturbance on moose habitat availability and distribution and survival and reproduction in the ungulate effects assessment Local Study Area Operations.

The effectiveness of mitigation measures will be evaluated Operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.5.4.18.3 Predicted Residual Effects

The implementation of mitigation measures is expected to limit negative effects on moose habitat availability, habitat distribution, and survival and reproduction from sensory disturbance; however, effects on moose from sensory disturbance cannot be entirely avoided or mitigated. As such, sensory disturbances from construction activities and operation of the Community Access Road are predicted to reduce the suitability of moose habitat by causing avoidance and movements away from the effects assessment Construction Disturbance Area. Therefore, changes to moose habitat availability, habitat distribution, and survival and reproduction from sensory disturbance during Operations

are anticipated to have a net residual effect on moose. Residual effects from sensory disturbance were carried forward into the characterization of residual effects.

Effects from sensory disturbance are probable and will be confined to the ungulate effects assessment Local Study Area (in other words, local scale effect). Effects will be continuous during Operations. Effects from Project-related sensory disturbance on the ability of the regional moose population to remain self-sustaining and ecologically effective are anticipated to be negative and low in magnitude during Operations.

9.4.5.4.19 Changes to Moose from Linear Barriers

9.4.5.4.19.1 Potential Effects

Habitat Availability and Distribution

During Operations, some of the access roads developed during construction will be decommissioned. Barriers will be placed at the start of these access roads and public access will be prohibited, which is anticipated to limit vehicle traffic and human activity. Moose have been found to exhibit both avoidance and selection of secondary roads in areas with low human activity (Laurian et al., 2008a,b; Eldegard et al., 2012; Bowman et al., 2010; Dickie et al., 2020). There is potential for moose to use decommissioned access roads as travel corridors (Dickie et al., 2020) or to use roadside habitat (ditches) along these access roads to feed on new vegetation growth in spring (Rea et al., 2010; Bowman et al., 2010; Jakobsson et al., 2018). However, it is possible that some individuals in the ungulate effects assessment Local Study Area will avoid decommissioned and revegetated access roads because moose generally perceive roads as risky, especially if predators use them for travel (Dickie et al., 2020).

The effects of these linear features on moose movement and habitat connectivity are expected to persist through Operations.

Survival and Reproduction

Project linear features have the potential to cause increased moose mortality risk during Operations from an increase in moose-vehicle collisions, hunting pressure (from increased public access) and predator encounters (from increased predator access).

9.4.5.4.19.2 Mitigation and Enhancement Measures

Mitigations outlined in **Section 9.4.5.3.11** will be implemented to minimize effects from linear barriers on moose habitat availability and distribution and survival and reproduction in the ungulate effects assessment Local Study Area during construction and / or Operations.

At watercourse crossings that occur within Category 1 caribou habitat and are on the north-south segment of the Preferred Route and at watercourse crossings that occur within Category 1 habitat and on the east-west segment of the preferred modified bridge and bridge embankments will be designed to incorporate terrestrial pathways adjacent to the aquatic habitat and allow for ungulate passage, where feasible given land cover considerations. These design features include increasing the height of bridge to minimum 4 metres vertical clearance, using natural substrates on the bridge embankments and under the bridge, allow for an unobstructed line of sight on either side of the bridge, and clear and maintain the minimum width of right-of-way at bridge crossings. In other locations along the Community Access Road where frequent crossings of species at risk are anticipated [in other words, in caribou Category 1 habitat (**Figure 9.4-7** to **Figure 9.4-9**) and moose high suitability habitats (**Figure 9.4-14**)], reduced speed limits will be implemented and wildlife-friendly road embankments with gentle slopes (in other words, gradual incline) and smooth crush material will be constructed to encourage safe crossing. Specific sites will be informed by caribou collar data, habitat modelling and Indigenous Knowledge.

9.4.5.4.19.3 Predicted Residual Effects

The implementation of mitigation measures is expected to limit negative effects on moose habitat availability, habitat distribution, and survival and reproduction from introducing linear barriers in the ungulate effects assessment Local Study Area during Operations. However, the addition of the permanent, Community Access Road is expected to affect moose movements and behaviour (in other words, inducing avoidant behaviour) within and surrounding the ungulate effects assessment Local Study Area (in other words, local to regional scale effect). Reduced moose mobility and habitat connectivity is expected to be most affected within the southcentral portion of the ungulate effects assessment Local Study Area where a large extent of high suitability habitat will be fragmented (**Figure 9.4-14b**).

As such, changes to moose habitat availability, habitat distribution, and survival and reproduction from linear barriers during Operations are anticipated to have a net residual effect and is carried forward to the residual effects characterization.

Effects on moose habitat availability and survival and reproduction are expected to be felt by moose with home ranges that overlap the ungulate effects assessment Local Study Area (local effect) but also may affect the movement and connectivity of animals in the surrounding habitats of the moose effects assessment Regional Study Area (regional effect). Effects from linear barriers on the ability of the regional moose population to remain self-sustaining and ecologically effective are anticipated to be negative and low in magnitude during Operations.

9.4.5.4.20 Changes to Moose from Increase in Predator Access

9.4.5.4.20.1 Potential Effects

Survival and Reproduction

There is potential that the increase in decommissioned access roads during Operations will improve predator mobility and increase encounter rates between predators and moose in the ungulate effects assessment Local Study Area (James and Stuart-Smith, 2000; Whittington et al., 2011). Consequently, predation risk for moose may increase, leading to a decline in moose survival and reproduction at the local scale.

Additionally, moose are often attracted to revegetating access roads to browse on early seral vegetation once it becomes available about 6 to 10 years following revegetation. If moose occupy revegetating access roads for foraging, and predators use these access roads for travel, this could result in an increase in predator-moose encounters and predation events. This potential effect is expected to be likely to occur and would be felt continuously by moose during the length of time where early to mid-seral vegetation is present on revegetating access roads. Predators are expected to continue avoiding the Community Access Road during Operations due to vehicle traffic and human activity that will occur along the road.

Overall, the increase in linear features (mainly access roads) due to the Project could lead to an increase in moose predation risk from increased predator access in the ungulate effects assessment Local Study Area. Potential increases in moose predation is more likely to occur during Operations when decommissioned access roads with little human activity are available for predators to travel, compared to during construction. A measurable change in survival and reproduction in the regional population within the moose effects assessment Regional Study Area may also be detected depending on the magnitude, duration and frequency of the local change in predation.

9.4.5.4.20.2 Mitigation and Enhancement Measures

Mitigations outlined in **Section 9.4.5.3.11** will be implemented to minimize effects from increased predator access on moose survival and reproduction in the ungulate effects assessment Local Study Area during Operations.

The effectiveness of mitigation measures will be evaluated during Operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

9.4.5.4.20.3 Predicted Residual Effects

Implementing mitigation measures is expected to reduce the negative effects on moose survival and reproduction from an increase in predator access (from introduced Project linear features). The potential for increases in moose mortalities due to increased predator access will be greatest during Operations when predators are more likely to use decommissioned access roads for travel (in other words, forage) may attract moose. However, it is uncertain how frequently predators will use access roads and the level of increase in encounter rates that will result (effect is likely but uncertain).

Considering that potential increases in predator encounters will be restricted to Project roads and adjacent habitats, effects from an increase in predator access due to the Project will be largely constrained to the ungulate effects assessment Local Study Area. Therefore, an increase in predation risk is expected to primarily affect moose with home ranges that overlap the ungulate effects assessment Local Study Area, with little to no measurable change to the moose population at the scale of the moose effects assessment Regional Study Area. Changes to moose survival and reproduction from increased predator access due to the Project are anticipated to have a net residual effect and is carried forward to the residual effects characterization.

Effects on moose survival and reproduction from increased predator access are predicted to be felt continuously, long-term in duration, and irreversible (for the Community Access Road and permanent access roads) to reversible (for access roads that will be revegetated). During Operations, effects will be confined to the ungulate effects assessment Local Study Area (local effect). Considering the increase in linear feature density due to the Project will be minimal (<0.01 kilometres per square kilometre in the moose effects assessment Regional Study Area), and linear corridors will remain absent or limited throughout much of the regional area, effects from increased predator access on the ability of the regional moose population to remain self-sustaining and ecologically functional are anticipated to be negative and low in magnitude during Operations.

9.4.5.4.21 Changes to Moose from Increase in Public Access

9.4.5.4.21.1 Potential Effects

Survival and Reproduction

Although increase in public access will initially occur during construction, the effects on moose survival and reproduction will continue through Operations of the Project. The effects will be stronger during operations when public travel along the Community

Access Road is permitted, compared to Construction when public access will be prohibited.

9.4.5.4.21.2 Mitigation and Enhancement Measures

Mitigations outlined in **Section 9.4.5.3.11** will be implemented to minimize effects from increased public access on moose survival and reproduction in the ungulate effects assessment Local Study Area during Operations.

9.4.5.4.21.3 Predicted Residual Effects

The Project is expected to result in a measurable increase in public access and hunting opportunities for Indigenous and non-Indigenous hunters in the ungulate effects assessment Local Study Area throughout the lifetime of the Project, but particularly during operations when public vehicle use along the Community Access Road is permitted. As a result, moose mortality risk from hunter harvest is likely to increase, particularly for moose in Wildlife Management Unit 17 with home ranges near the Community Access Road (in other words, local to regional effect). However, the magnitude of increase in Indigenous and non-Indigenous moose hunter harvest that will occur due to the Project is largely unknown. This is because current harvest levels by Indigenous hunters in the region are unknown as there is no mandatory or voluntary reporting of Indigenous moose harvest, and adaptive management of non-Indigenous moose harvest by the government is not a mitigation measure for effects from the Project and there is uncertainty if an increase in non-Indigenous hunting pressure will be managed at sustainable levels.

As such, changes to moose survival and reproduction from increased public access due to the during Operations are anticipated to have a net residual effect and is carried forward to the residual effects characterization.

During Operations, effects on moose survival and reproduction from increased human access is expected to be felt continuously, is probable, and would be confined to the ungulate effects assessment Local Study Area with potential to extend into the moose effects assessment Regional Study Area (local to regional effect). Effects on moose are expected to be negative, long-term, and irreversible during Operations. However, there is high uncertainty in the magnitude of predicted effects of increased human access and associated increase in potential hunter harvest on moose survival and reproduction during Operations. As a result a precautionary approach was applied and it was assumed that Project-related changes to moose population survival and reproduction from increased access could reach unsustainable levels and lead to decreased resilience and maintenance of the self-sustaining and ecologically effective regional moose population.

9.4.5.4.22 Changes to Moose from Collision with Vehicles and Equipment

9.4.5.4.22.1 Potential Effects

Survival and Reproduction

The likelihood of moose-vehicle collisions is expected to be greatest in Operations due to the higher traffic volumes anticipated during this Phase. Mortality events that occur during Operations are more likely to be attributed to collisions with public and industry vehicles that are not associated with the Project, rather than Project-vehicles.

Moose-vehicle collision risk is expected to be greatest in Wildlife Management Unit 17 along the southern segments of the Community Access Road where the largest concentration of high suitability winter habitat in the ungulate effects assessment Local Study Area occurs, and where the greatest traffic volumes are anticipated (**Figure 9.4-14**). Moose can be attracted to new vegetation growth along roadsides (for example, ditches) in the spring (Brown et al., 2012; Gagnon et al., 2024). Given this, an increased risk of moose-vehicle collisions may occur along segments of the Community Access Road where quality forage is available next to the road. However, moose often avoid roads with high traffic volume (Laurian et al., 2008b; Bowman et al., 2010; Fahrig and Rytwinski, 2009), and thus, some individuals are expected to avoid the Community Access Road, which would likely reduce the number of vehicle-moose collisions.

9.4.5.4.22.2 Mitigation and Enhancement Measures

Mitigations outlined in **Section 9.4.5.3.11** will be implemented to minimize effects from collisions with vehicles and equipment on moose survival and reproduction in the ungulate effects assessment Local Study Area during Operations.

9.4.5.4.22.3 Predicted Residual Effects

Implementation of mitigation is predicted to limit moose (and other wildlife) mortality from collisions with vehicles and equipment during Operations. The largest risk to moose from collisions with vehicles is anticipated to occur during Operations when public traffic volume is highest and there are less enforceable mitigations to implement. Considering that the potential increase in moose-vehicle collisions will be restricted to Project roads, particularly the Community Access Road, a decrease in survival and reproduction is predicted to be limited to moose with home ranges that overlap the effects assessment Construction Disturbance Area. Therefore, most of the effect on the moose population from collisions with vehicles is predicted to occur within the ungulate effects assessment Local Study Area with little to no measurable change at the scale of the moose effects assessment Regional Study Area.

As such, changes to moose survival and reproduction from moose-vehicle collisions during Operations are anticipated to have a net residual effect and is carried forward to the residual effects characterization.

Effects will be long-term and irreversible (permanent), will be felt continuously, and are expected to be confined to the ungulate effects assessment Local Study Area (local effect). Effects from an increase in collision with vehicles on the ability of the regional moose population to remain self-sustaining and ecologically effective are anticipated to be negative and low to moderate in magnitude during Operations. If monitoring indicates that vehicle-related mortality may be strongly influencing moose populations, then additional mitigation measures will be evaluated and implemented.

9.4.5.5 Summary of Residual Effects

Table 9.4-14 provides a summary of the potential effects on ungulates, mitigation measures, and residual effects. Detailed information is included in **Appendix M**.

Table 9.4-14: Summary of Residual Effects for Ungulates and Characterization

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
• **Caribou and Moose**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Introduction and spread of invasive plant species—Can affect plant community composition, which can affect ungulate habitat availability and distribution.	• A comprehensive list of mitigation measures to control weeds during construction is provided in the Vegetation Technical Support Document (Appendix J) and Peatlands Technical Support Document (Appendix I). • Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction.	• Residual changes in caribou and moose habitat availability and distribution due to introduction and spread of invasive plant species	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration / Reversibility: Short term / Reversable • Frequency: Infrequent • Likelihood: Possible • Significance: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect
• **Caribou and Moose**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Introduction and spread of invasive plant species—Can affect plant community composition, which can affect ungulate habitat availability and distribution.	• A comprehensive list of mitigation measures to control weeds during Operations is provided in the Vegetation Technical Support Document (Appendix J) and Peatlands Technical Support Document (Appendix I). • Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during Operations	• Residual changes in caribou and moose habitat availability and distribution due to introduction and spread of invasive plant species	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration / Reversibility: Long term / Reversable • Frequency: Infrequent • Likelihood: Possible • Significance: Not Significant • Uncertainty: Low • Direct / Indirect: Indirect
• **Caribou and Moose**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and	• Construction	• Emissions of Criteria Air Contaminants—Deposition of suspended solids in criteria air contaminant emissions (for example, potential acid inputs) may change soil quality and vegetation and affect ungulate habitat availability and distribution.	• A comprehensive list of mitigation measures that will be implemented to limit dust deposition during construction is provided in the Atmospheric Environment Technical Support Document (**Appendix S**).	• No residual effect anticipated	• No residual effect anticipated

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
	surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas					
• **Caribou and Moose**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Emissions of Criteria Air Contaminants—Deposition of suspended solids in criteria air contaminant emissions (for example, potential acid inputs) may change soil quality and vegetation and affect ungulate habitat availability and distribution.	• A comprehensive list of mitigation measures that will be implemented to limit dust deposition during Operations is provided in the Atmospheric Environment Technical Support Document (**Appendix S**).	• No residual effect anticipated	• No residual effect anticipated
• **Caribou and Moose**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Temporary concrete batch plants • Pits and quarries • Drilling / blasting / aggregate production • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Fugitive Dust Emissions — Fugitive dust emissions and deposition may cause changes in soils and vegetation, which can adversely affect ungulate habitat availability and distribution.	• A comprehensive list of mitigation measures that will be implemented to limit dust deposition during construction is provided in the Atmospheric Environment Technical Support Document (**Appendix S**).	• Residual changes to caribou and moose habitat availability and distribution from dust emissions and deposition	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local Study Area • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Certain • Significance: Not Significant • Uncertainty: Low • Direct / Indirect: Direct
• **Caribou and Moose**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Fugitive Dust Emissions — Fugitive dust emissions and deposition may cause changes in soils and vegetation, which can adversely affect ungulate habitat availability and distribution.	• A comprehensive list of mitigation measures that will be implemented to limit dust deposition during Operations is provided in the Atmospheric Environment Technical Support Document (**Appendix S**).	• Residual changes to caribou and moose habitat availability and distribution from dust emissions and deposition	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local Study Area • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Certain • Significance: Not Significant • Uncertainty: Low • Direct / Indirect: Direct

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
• **Caribou and Moose**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Temporary concrete batch plants • Pits and quarries • Drilling / blasting / aggregate production • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Erosion and sedimentation—Vegetation clearing, earth moving, pit and quarry development and other Project activities can result in the release of sediment, which may change the composition and function of vegetation communities and affect ungulate habitat availability and distribution.	• A comprehensive list of mitigation measures to limit changes from erosion and sedimentation during construction is provided in the Vegetation Technical Support Document (Appendix J) and the Surface Water Technical Support Document (**Appendix F**). • Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction.	• No residual effect anticipated	• No residual effect anticipated
• **Caribou and Moose**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Erosion and sedimentation—Vegetation clearing, earth moving, pit and quarry development and other Project activities can result in the release of sediment, which may change the composition and function of vegetation communities and affect ungulate habitat availability and distribution.	• A comprehensive list of mitigation measures to limit changes from erosion and sedimentation during Operations is provided in the Vegetation Technical Support Document (**Appendix J**) and the Surface Water Technical Support Document (**Appendix F**). • Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during Operations.	• No residual effect anticipated	• No residual effect anticipated
• **Caribou and Moose**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration	• Construction	• Surface water quantity—Alteration of surface water drainage patterns, flows, and levels that can cause changes to soils and vegetation, which can affect ungulate habitat availability and distribution.	• A comprehensive list of mitigation measures to limit changes to surface water quantity during construction is provided in the Surface Water Technical Support Document (**Appendix F**). • Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction.	• No residual effect anticipated	• No residual effect anticipated

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
	• Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas					
• **Caribou and Moose**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Surface water quantity—Alteration of surface water drainage patterns, flows, and levels that can cause changes to soils and vegetation, which can affect ungulate habitat availability and distribution.	• Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during Operations. • A comprehensive list of mitigation measures to limit changes to surface water quantity during Operations is provided in the Surface Water Technical Support Document (**Appendix F**).	• No residual effect anticipated	• No residual effect anticipated
• **Caribou and Moose**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Surface water quality—Changes in surface water quality from contact with the road surface and quarries could adversely affect ungulate habitat availability and distribution	• A comprehensive list of mitigation measures to limit changes to surface water quality during construction and operations is provided in the Surface Water Technical Support Document (**Appendix F**). • Follow best management practices and environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Fisheries and Oceans Canada, Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources.	• No residual effect anticipated	• No residual effect anticipated
• **Caribou and Moose**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Surface water quality—Changes in surface water quality from contact with the road surface and quarries could adversely affect ungulate habitat availability and distribution	• A comprehensive list of mitigation measures to limit changes to surface water quality during Operations is provided in the Surface Water Technical Support Document (**Appendix F**). • Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during Operations.	• No residual effect anticipated	• No residual effect anticipated

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
• **Caribou and Moose**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Changes to Groundwater — Alteration of groundwater drainage and infiltration patterns, flows, and levels that can cause changes to soils and vegetation, which can affect ungulate habitat availability and distribution.	• A comprehensive list of mitigation measures to limit changes to groundwater quantity during construction is provided in the Groundwater Technical Support Document (**Appendix H**). • Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction.	• Residual changes to caribou and moose habitat availability and distribution from changes to groundwater quantity.	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local Study Area • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Probable • Significance: Not Significant • Uncertainty: Moderate • Direct / Indirect: Direct
• **Caribou and Moose**	• Operate the Preferred Route • Maintain the Preferred Route Maintenance	• Operations	• Changes to Groundwater — Alteration of groundwater drainage and infiltration patterns, flows, and levels that can cause changes to soils and vegetation, which can affect ungulate habitat availability and distribution.	• A comprehensive list of mitigation measures to limit changes to groundwater quantity during Operations is provided in the Groundwater Technical Support Document (**Appendix H**). • The groundwater monitoring program is described in more detail in the Peatlands Technical Support Document (**Appendix I**). • Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction.	• Residual changes to caribou and moose habitat availability and distribution from changes to groundwater quantity.	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local Study Area • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Probable • Significance: Not Significant • Uncertainty: Moderate • Direct / Indirect: Direct
• **Caribou and Moose**	• Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing	• Construction	• Wildlife Attractants—Attraction of wildlife to the Project site (for example, food waste, sewage, petroleum-based products, dust suppressants, explosive powder, site runoff ponds) may increase human-wildlife interactions and change predator-prey relationships, which can affect animal survival and reproduction.	• An Environmental Protection Plan will be developed and implemented that includes policies and actions anticipated to mitigate the attraction of wildlife to the Construction Disturbance Area, particularly near the temporary construction staging areas and temporary construction camps. • A Waste Management Plan will be developed and implemented that describe the appropriate management of solid, liquid and hazardous waste, including: – Construction-related garbage, debris, and surplus materials. – Hazardous materials such as used oil, filter and grease cartridges, lubrication containers. – Domestic garbage and camp waste (such as, food and grey water). Portable, secure, solid	• Residual changes to caribou and moose survival and reproduction from attractants	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Possible • Significance: Not Significant • Uncertainty: Low • Direct / Indirect: Direct

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
				waste receptacles will be provided on work sites, temporary laydown areas and temporary construction camps and periodically emptied. • Construction staff will be educated about hazards of littering and feeding wildlife. A no littering policy will be implemented and enforced. • Feeding and harassment of wildlife on site will be prohibited. • De-icing salts will not be used on the unpaved Community Access Road during construction or operation. • Roadkill will be cleaned up during construction and operations following best management practices outlined by Ontario's Ministry of Transportation. • Collect domestic (for example, food) and industrial (for example, used oil and lubricants) waste and store temporarily in wildlife proof containers. Transport all waste offsite for recycling or disposal at a licensed disposal facility. • Potentially toxic materials that attract wildlife will be stored in secure areas inaccessible to wildlife (for example, buildings, storage areas surrounded by wildlife-proof fencing), and toxic materials will be monitored continuously when removed from storage until they are used or returned to storage to prevent wildlife accessing and ingesting the materials. • Empty chemical toilets on site regularly by a licensed sewage-handling owner / operator. • The method of domestic sewage disposal at temporary construction camps will be determined during detail design. Options may include holding tank systems with offsite disposal or onsite leaching beds designed in accordance with applicable codes and approvals. All required permits and authorizations will be acquired for construction and operation of these. Where subsurface sewage disposal systems are proposed, they will be designed in accordance with the Ontario Building Code for systems under 10,000 litres per day. For systems exceeding this threshold, approval under Section 53 of the Ontario *Water Resources Act* will be obtained. If required and when feasible, domestic wastewater will be removed by approved disposal trucks and disposed of at wastewater treatment plants with the authorization and capacity to accept this wastewater.		

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
• **Caribou and Moose**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Wildlife Attractants—Attraction of wildlife to the Project site (for example, food waste, sewage, petroleum-based products, dust suppressants, explosive powder, site runoff ponds) may increase human-wildlife interactions and change predator-prey relationships, which can affect animal survival and reproduction.	• Roadkill, debris, and waste management as per Ministry of Transportation's Debris Control Maintenance Quality Standard (MQS-331) and Ministry of Transportation's Rest Area / Picnic Site Maintenance Best Practice (MBP-325).	• Residual changes to caribou and moose survival and reproduction from attractants	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Possible • Significance: Not Significant • Uncertainty: Low • Direct / Indirect: Direct
• **Caribou and Moose**	• Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Pits and quarries • Drilling / blasting / aggregate production	• Construction	• Blasting and associated fly rock—may result in injury or mortality to wildlife.	• A comprehensive list of mitigation measures to minimize effects from blasting during construction is provided in the Acoustic and Vibration Environment Technical Support Document (Appendix P). • An Environmental Protection Plan will be implemented that includes policies and actions for avoiding and minimizing the risks of blasting and blasting materials to wildlife, including ungulates. • Blasting work will be completed as quickly as possible to shorten the duration of disturbance. • Blasting will be suspended within 10 kilometres of known or potential caribou Category 1 areas during sensitive periods to minimize sensory disturbances (nursery areas: May 1 to July 14 very low tolerance, July 15 to September 15 low tolerance; winter use areas: December 1 to March 31; Ministry of the Environment, Conservation and Parks, 2025, 2013b). If timing windows cannot be adhered to, follow environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources. • Open excavations and blasting areas will be fenced off if left unsupervised to avoid injury and mortality of ungulates. • A buffer zone will be placed around the perimeter of blasting activities and surrounding forested habitat. Blasting will be prohibited if large mammals (such as, moose and / or caribou) are observed within 500 metres from the blasting location. Pre-blasting surveys will be developed in the Environmental Protection Plan and followed.	• No residual effect anticipated	• No residual effect anticipated

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
• **Caribou and Moose**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Blasting and associated fly rock—may result in injury or mortality to wildlife.	• A comprehensive list of mitigation measures that will be implemented during Operations is provided in Acoustic and Vibration Environment Technical Support Document (Appendix P). • Blasting will be suspended within 10 kilometres of known or potential caribou Category 1 areas during sensitive periods to minimize sensory disturbances (nursery areas: May 1 to July 14 very low tolerance, July 15 to September 15 low tolerance; winter use areas: December 1 to March 31; Ministry of the Environment, Conservation and Parks, 2025, 2013b). If timing windows cannot be adhered to, follow environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources.	• No residual effect anticipated	• No residual effect anticipated
• **Caribou and Moose**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary construction camps • Temporary access roads and trails • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Chemical or hazardous material stored on the Project site, or spills—(for example, petroleum products, ammonium nitrate) on site or along access or haul roads can affect wildlife survival and reproduction.	• Adhere to federal and provincial regulations and guidelines regarding hazardous substance collection and storage, use and handling, and disposal and treatment, such as the *Transportation of Dangerous Goods Act* (Government of Canada, 1992), *Dangerous Goods Handling and Transportation Act* (Government of Ontario, 1990j), and the *Environmental Protection Act* (Government of Ontario, 1990e). • Mitigation measures described in the Surface Water Technical Support Document (**Appendix F**), Groundwater Technical Support Document (**Appendix H**), Physiography, Terrain, and Soils Technical Support Document (**Appendix N**), and Vegetation Technical Support Document (**Appendix J**) will be implemented to minimize effects from chemical and hazardous material spills in the ungulate effects assessment Local Study Area during construction.	• No residual effect anticipated	• No residual effect anticipated
• **Caribou and Moose**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Chemical or hazardous material stored on the Project site, or spills—(for example, petroleum products, ammonium nitrate) on site or along access or haul roads can affect wildlife survival and reproduction.	• Mitigation measures described in the Surface Water Technical Support Document (**Appendix F**), Groundwater Technical Support Document (**Appendix H**), Physiography, Terrain, and Soils Technical Support Document (**Appendix N**), and Vegetation Technical Support Document (**Appendix J**) will be implemented to minimize effects from chemical and hazardous material spills in the ungulate effects assessment Local Study Area during Operations.	• No residual effect anticipated	• No residual effect anticipated

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
• **Boreal Caribou**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Pits and quarries • Temporary concrete batch plants • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Habitat loss—The loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence ungulate abundance and distribution.	• Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction. • Locate the Project route in such a way that minimizes overlap with sensitive habitats to the extent feasible, including provincially identified Category 1 areas for caribou (nursery areas, winter use areas, travel corridors; Government of Ontario, 2013a) and potential new Category 1 areas identified in this Environmental Assessment / Impact Statement, areas which contain biophysical habitat attributes for caribou (Environment and Climate Change Canada, 2020), and significant wildlife habitat for moose. • The Project footprint is designed to minimize vegetation clearing and access road requirements to the extent feasible (for example, concentrate temporary activities spatially, retain habitat outside of scoped Construction Disturbance Area, restrict construction vehicle traffic to established access roads where feasible). • Limit to the extent feasible the construction of temporary (for example, access road) and permanent structures in wetlands or within 30 metres setback from a wetland. If construction cannot avoid wetlands and 30 metres setback, Ministry of Natural Resources will be notified as soon as possible prior to work starting. Work may will not be conducted unless approval is obtained from the appropriate regulatory agencies. • Construction of the Community Access Road will be conducted in phases (segment by segment) to limit the amount of disturbance at any particular time. • The Project construction schedule will avoid activities during the sensitive timing windows for caribou (in other words, May 1 to September 15 for nursery areas, December 1 to March 31 for winter use areas) within 10 kilometres of known and potential new Category 1 areas, to the extent practical. When activity restrictions cannot be followed, the Ministry of the Environment, Conservation and Parks will be engaged to determine alternative approaches. • Retain function, quality and connectivity of compatible habitat features (for example,	• Residual changes in habitat availability, use, connectivity, and abundance and distribution of caribou and moose due to habitat loss	• Context: Ecological • Direction: Negative • Magnitude: Caribou Regional Area: Low; Missisa range: low; Nipigon Range: Moderate; Ozhiski range: negligible; Pagwachuan: negligible • Geographic Extent: Local for habitat availability and survival and reproduction; Regional for habitat distribution (caribou movement and connectivity). • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Certain • Significance: Caribou Regional Study Area: Not significant; Missisa range: Not significant; Nipigon range: Significant; Ozhiski range: Not significant; Pagwachuan range: Not significant • Uncertainty: Low for habitat availability and survival and reproduction; High for habitat distribution (caribou movement and connectivity) • Direct / Indirect: Direct

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
				vegetation, trees, wildlife trees, coarse woody debris) as much as possible, particularly in selective, environmentally sensitive areas, to the extent practical and where safe to do so (for example, using proper setbacks of key habitat features, avoid severe water fluctuations, avoid terrestrial islands, avoid mineral licks, avoid unburned areas within wildfire perimeters, avoid migratory pathways). • Limit clearing of riparian vegetation (within 30 metres of waterbodies) to the extent practical and to the requirement of the access road and alignment clearing width only. • Known sensitive ecological features will be clearly marked (for example, wetlands and significant wildlife habitat) with associated setbacks. Engage with applicable government agency (Ministry of the Environment, Conservation and Parks, Ministry of Natural Resources and Environment and Climate Change Canada) if sensitive ecological features are encountered or cannot be avoided. • Use construction practices which encourage the eventual natural recovery / growth of native species (for example, winter exploration programs on frozen ground with no ripping or grubbing soil). • Maintain or improve ungulate habitat by using techniques that accelerate revegetation (for example, minimize topsoil removal, preserve adequate substrate, leave surface vegetation root mat intact). • Where possible, schedule work activities in wet areas during frozen conditions. • Under non-frozen conditions and where regulatory approvals allow, install mats (for example, rig mats, swamp mats or access mats) to limit effects on waterbodies and wetlands, if warranted and surface conditions require. • A Vegetation Management Plan including measures to protect rare plants and rare vegetation communities will be developed and implemented by the owner / operator. In the event a rare plant species or a rare vegetation community are encountered unexpectedly, or cannot be avoided, the rare plant protection measures outlined in the Vegetation Management Plan will be implemented. • Erosion control practices (for example, contouring) will limit wind and water erosion on cover soil and overburden stockpiles (for		

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
				example, vegetation, erosion mats) as well as will encourage regrowth of vegetation. • Prevent starting wildfires from Project activities (for example, have readily available fire extinguishers, firefighting equipment, water packs / pails, provide firefighting training to staff, keep equipment clean and in good condition, no smoking outside designated areas, prepare an Emergency Response Plan). • Use progressive restoration and adopt practices to facilitate conifer recovery (for example, elevate mulching drums) on site once temporary construction areas are no longer needed. The time interval between commencement and completion of any work that disturbs earth surfaces will be a maximum of 20 calendar days. Commencement of such work will be considered to have occurred when the original stabilizing ground cover has been removed, including grubbing, or has been covered with fill material. Completion of such work will be considered to have occurred when the cover material (seed and mulch, seed and erosion control blanket, sod, rip-rap) has been applied. Where the timing of the operation results in a conflict with the application requirements of the specified cover, the owner / operator will determine appropriate interim measures that afford temporary protection until such a time as final cover can be applied. • Avoid re-entry and disturbance of reclaimed temporary access areas through combined use of physical control measures (rollback, remove of creek crossings, recontouring to surrounding topography, revegetation / reforesting and / or barriers at junctions with active access). • Reclaim temporary access roads, construction camps, waterbody crossings and laydown areas at the end of construction. • An Environmental Protection Plan and a Cleanup and Reclamation Plan will be developed and implemented. Where necessary, seedling planting will occur to improve restoration success on areas of temporary disturbance (for example, temporary access roads, laydown areas, camps, and workspaces) where habitat enhancement is identified. Reclamation plans will be confirmed through engagement with Indigenous communities, the Ministry of Natural Resources and local foresters. Effectiveness of revegetation efforts		

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				will be monitored and managed post-construction, including confirmation that vegetation communities that naturally regenerate (or were planted) are similar to adjacent vegetation communities. If required, adaptive management will be employed to modify or enhance any reclamation efforts. • Restore on site should consider maintaining or improving wildlife habitat. Consider planting native trees, preferably conifers, to accelerate revegetation of the access roads and other temporary disturbances (or progressive reclamation through project life cycle). • A comprehensive list of mitigation measures to control weeds during construction and operations of the Project is provided in the Vegetation Technical Support Document (**Appendix J**) and Peatlands Technical Support Document (**Appendix I**).		
• **Boreal Caribou**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Habitat loss—The loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence ungulate abundance and distribution.	• Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources will be followed during Operations. • Maintenance activities with high levels of disturbance will avoid the sensitive timing windows for caribou (May 1 to September 15 for nursery areas, December 1 to March 31 for winter use areas) in known and potential new Category 1 areas, to the extent practical. When activity restrictions cannot be followed, the Ministry of the Environment, Conservation and Parks will be engaged to determine alternative approaches. • Complete maintenance work as quickly as possible to shorten the duration of disturbance. • Ongoing use of inactive areas will be prevented through combined use of physical control measures (rollback, remove of creek crossings, recontouring to surrounding topography, revegetation / reforesting and / or barriers at junctions with active access). • Avoid re-entry and disturbance of reclaimed temporary access areas through combined use of physical control measures (rollback, remove of creek crossings, recontouring to surrounding topography, revegetation / reforesting and / or barriers at junctions with active access).	• Residual changes in habitat availability, use, connectivity, and abundance and distribution of caribou and moose due to habitat loss	• Context: Ecological • Direction: Negative • Magnitude: Caribou Regional Study Area: low; Missia Range: low; Nipigon Range: moderate • Geographic Extent: Local for habitat availability and survival and reproduction; Regional for habitat distribution (caribou movement and connectivity). • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Certain • Significance: Caribou Regional Study Area: Not significant; Missisa range: Not significant; Nipigon range: Significant; Ozhiski range: Not significant; Pagwachuan range: Not significant • Uncertainty: Low for habitat availability and survival and reproduction; High for habitat distribution (caribou movement and connectivity) • Direct / Indirect: Direct

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
• **Boreal Caribou**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Pits and quarries • Temporary concrete batch plants • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Habitat alteration—Alteration of final terrain and soil conditions, and / or plant species composition, could change the types of ecosystems that can be reclaimed on the landscape and adversely affect ungulate habitat availability and distribution, and survival and reproduction.	• Follow the Construction mitigation measures for habitat loss. • Concentrate activities spatially and temporally to minimize fragmentation and barriers to movement. • Minimize elevation and slope of soil piles and berms to allow ungulates to have clear line of sight to adjacent habitat. • Along the Project right-of-way and the access roads, maintain gaps in road berms and snowbanks to facilitate wildlife crossing at drainages, wildlife trails, strategic crossing points informed by movement data and Indigenous Knowledge, or connected habitat patches so that ungulate movements across roads are not blocked.	• Residual changes in habitat availability and distribution and survival and reproduction due to habitat alteration	• Context: Ecological • Direction: Negative • Magnitude: Caribou Regional Study Area: low; Missia Range: low; Nipigon Range: moderate • Geographic Extent: Local for habitat availability and survival and reproduction; Regional for habitat distribution (caribou movement and connectivity). • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Certain • Significance: Caribou Regional Study Area: Not significant; Missisa range: Not significant; Nipigon range: Significant; Ozhiski range: Not significant; Pagwachuan range: Not significant • Uncertainty: Low for habitat availability and survival and reproduction; High for habitat distribution (caribou movement and connectivity) • Direct / Indirect: Indirect
• **Boreal Caribou**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Habitat alteration—Alteration of final terrain and soil conditions, and / or plant species composition, could change the types of ecosystems that can be reclaimed on the landscape and adversely affect ungulate habitat availability and distribution, and survival and reproduction.	• Follow the Operations mitigation measures for habitat loss.	• Residual changes in habitat availability and distribution and survival and reproduction due to habitat alteration	• Context: Ecological • Direction: Negative • Magnitude: Caribou Regional Study Area: low; Missisa Range: low; Nipigon Range: moderate • Geographic Extent: Local for habitat availability and survival and reproduction; Regional for habitat distribution (caribou movement and connectivity). • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Certain • Significance: Caribou Regional Study Area: Not significant; Missisa range: Not significant; Nipigon range: Significant; Ozhiski range: Not significant; Pagwachuan range: Not significant • Uncertainty: Low for habitat availability and survival and reproduction; High for habitat distribution (caribou movement and connectivity) • Direct / Indirect: Indirect

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
• **Boreal Caribou**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Pits and quarries • Temporary concrete batch plants • Drilling / blasting aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Sensory disturbance—(for example, lights, smells, noise, human activity) can alter ungulate habitat availability, use and connectivity (movement and behaviour), which can lead to changes in abundance and distribution and adversely affect survival and reproduction.	• A comprehensive list of mitigation measures to minimize effects from noise during construction is provided in the Acoustic and Vibration Environment Technical Support Document (Appendix P). • Environmental approval conditions, permits, or authorizations issued for Construction, including those issued from Fisheries and Oceans Canada, Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed. • Locate the Project route in such a way that minimizes overlap with sensitive habitats to the extent feasible, including provincially identified Category 1 areas for caribou (nursery areas, winter use areas, travel corridors; Government of Ontario, 2013a) and potential new Category 1 areas identified in this Environmental Assessment / Impact Statement, areas which contain biophysical habitat attributes for caribou (Environment and Climate Change Canada, 2020), and significant wildlife habitat for moose. • Construction of the Community Access Road will be conducted in phases to limit the amount of disturbance at any particular time. • Construction will be completed as quickly as possible to shorten the duration of disturbance. • The Project construction schedule will avoid activities during the sensitive timing windows for caribou (in other words, May 1 to September 15 for nursery areas, December 1 to March 31 for winter use areas) within 10 kilometres of known and potential new Category 1 areas, to the extent practical. When activity restrictions cannot be followed, the Ministry of the Environment, Conservation and Parks will be engaged to determine alternative approaches. • An Environmental Protection Plan will be developed and implemented that includes measures to limit noise disturbance from construction activities; this includes prohibiting use of engine retarder brakes, enforcing speed limits, reducing idling of vehicles, designing routes to minimize reversing (backup beeper), reducing traffic by locating camps near construction sites, and restricting construction traffic to designated areas and only construction personnel.	• Residual changes in habitat availability, use and connectivity (movement and behaviour), which can lead to changes in abundance and distribution and adversely affect survival and reproduction due to sensory disturbance	• Context: Ecological • Direction: Negative • Magnitude: Low • Geographic Extent: Local for habitat availability and survival and reproduction; Regional for habitat distribution (caribou movement and connectivity). • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Certain • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Indirect

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
				• Noise abatement, emission and pollution control equipment on machinery will be in place, properly maintained and in good working order. • Limit aerial operations when possible. When not feasible, a minimum ferry altitude of 400 metres above ground level will be maintained during sensitive timing periods to reduce sensory disturbance on caribou. • Limit light disturbance from nighttime operational activities by using directional lighting. Lighting required for Construction, including direction and timing to avoid effects on ungulates, will be controlled while meeting operational health and safety requirements. • Industry best practices will be used for blasting activities, including scheduling when in the vicinity of sensitive wildlife habitat areas. Forest buffers (30 metres width) will be retained around quarries to reduce noise, where feasible. • Prevent ongoing use of inactive areas through combined use of physical control measures (rollback, remove of creek crossings, recontouring to surrounding topography, revegetation / reforesting and / or barriers at junctions with active access).		
• **Boreal Caribou**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Sensory disturbance—(for example, lights, smells, noise, human activity) can alter ungulate habitat availability, use and connectivity (movement and behaviour), which can lead to changes in abundance and distribution and adversely affect survival and reproduction.	• A comprehensive list of mitigation measures to minimize effects from noise during Operations is provided in the Acoustic and Vibration Environment Technical Support Document (Appendix P). • Environmental approval conditions, permits, or authorizations issued for Operations, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed. • Maintenance work will be completed as quickly as possible to shorten the duration of disturbance. • The Environmental Protection Plan will be implemented to minimize sensory disturbance by owner / operators during Operations, including prohibiting use of engine retarder brakes, enforcing speed limits, and restricting maintenance traffic to designated areas. • Aerial operations will be limited when possible; when not feasible, minimum ferry altitude of	• Residual changes in habitat availability, use and connectivity (movement and behaviour), which can lead to changes in abundance and distribution and adversely affect survival and reproduction due to sensory disturbance	• Context: Ecological • Direction: Negative • Magnitude: Low • Geographic Extent: Local for habitat availability and survival and reproduction; Regional for habitat distribution (caribou movement and connectivity). • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Certain • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Indirect

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
				400 metres above ground level will be maintained during sensitive timing periods to reduce sensory disturbance on caribou. • Lighting required for Operations, including direction and timing to avoid effects on ungulates, will be controlled while meeting operational health and safety requirements. • Prevent ongoing use of inactive areas through combined use of physical control measures (rollback, remove of creek crossings, recontouring to surrounding topography, revegetation / reforesting and / or barriers at junctions with active access). • Speed limits will be enforced to reduce noise associated with vehicle traffic.		
• **Boreal Caribou**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Linear barriers—Roads and snowbanks on site roads and the access road could decrease habitat connectivity and adversely affect ungulate distribution and survival.	• Environmental approval conditions, permits, or authorizations issued for Construction, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources will be followed. • Locate the Project route in such a way that minimizes overlap with sensitive habitats to the extent feasible, including provincially identified Category 1 areas for caribou (nursery areas, winter use areas, travel corridors; Government of Ontario, 2013a) and potential new Category 1 areas identified in this Environmental Assessment / Impact Statement, areas which contain biophysical habitat attributes for caribou (Environment and Climate Change Canada, 2020), and significant wildlife habitat for moose. • The Project footprint is designed to minimize vegetation clearing and access road requirements to the extent feasible (for example, concentrate temporary activities spatially, retain habitat outside of scoped Construction Disturbance Area, restrict construction vehicle traffic to established access roads where feasible). • Construction will be conducted in phases to concentrate activities spatially and temporally to minimize fragmentation and barriers to movement across the landscape. • Limit to the extent practicable the construction of temporary (for example, access road, travel lane) and permanent structures in wetlands or within 30 metres setback from a wetland. If construction cannot avoid wetlands and 30 metres setback, Ministry of Natural	• Residual changes in habitat connectivity and associated caribou and moose distribution and survival due to linear barriers	• Context: Ecological • Direction: Negative • Magnitude: High • Geographic Extent: Local for habitat availability; Regional to beyond regional for habitat distribution and survival and reproduction (habitat and population connectivity and animal movement). • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Probable • Significance: Caribou Regional Study Area: Significant; Missisa range: Significant; Nipigon range: Significant; Ozhiski range: Significant; Pagwachuan range: Not significant • Uncertainty: High • Direct / Indirect: Direct

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
				Resources will be notified as soon as possible prior to work starting. Work may will not be conducted unless approval is obtained from the appropriate regulatory agencies. • Concentrate activities spatially and temporally to minimize fragmentation and barriers to movement across the landscape. • Minimize elevation and slope of soil piles and berms to allow ungulates to have clear line of sight to adjacent habitat. • Along the Project right-of-way and the access roads, maintain gaps in road berms and snowbanks to facilitate wildlife crossing at drainages, wildlife trails, strategic crossing points informed by movement data and Indigenous Knowledge, or connected habitat patches so that ungulate movements across roads are not blocked. • Snowbanks will be limited as much as possible and to a height of less than 1.6 metres. • Snow clearing along the access roads will incorporate road pull-outs at regular intervals to provide refuge for wildlife moving along the Community Access Road corridor. • At watercourse crossings that occur within Category 1 caribou habitat and are on the north-south segment of the Preferred Route (in other words, multi-span bridges WA-11 and WA-15, and clear span bridge WA-18), and at watercourse crossings that occur within Category 1 habitat and on the east-west segment of the Preferred Route (in other words, multi-span bridges W-34 and W-35, and clear span bridges NW-11, NW-12, NW-13, NW-14, NW-15, NW15A, NW-16, NW 17, NW-18) modified bridge and bridge embankments will be designed to incorporate terrestrial pathways adjacent to the aquatic habitat and allow for ungulate passage, where feasible given land cover considerations. These design features include increasing the height of bridge to minimum 4 metres vertical clearance, using natural substrates on the bridge embankments and under the bridge, allow for an unobstructed line of sight on either side of the bridge, and clear and maintain the minimum width of right-of-way at bridge crossings. In other locations along the Community Access Road where frequent crossings of species at risk are anticipated [in other words, in caribou Category 1 habitat (**Figure 9.4-7** to **Figure**		

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
				9.4-9) and moose high suitability habitats (**Figure 9.4-14**)], reduced speed limits will be implemented and wildlife-friendly road embankments with gentle slopes (in other words, gradual incline) and smooth crush material will be constructed to encourage safe crossing. Specific sites will be informed by caribou collar data, habitat modelling and Indigenous Knowledge • Traffic speeds during construction will be posted. Speeds will be determined by temporary access road conditions and the discretion of the constructing owner / operator. • Vehicular traffic will be confined to approved right-of-way, workspace and access roads or trails. • The time that road Construction materials are left on the ground will be minimized to limit physical barriers to movement. • No longer needed and prevent ongoing use of inactive areas through combined use of physical control measures (rollback, remove of creek crossings, recontouring to surrounding topography, revegetation / reforesting and / or barriers at junctions with active access). The time interval between commencement and completion of any work that disturbs earth surfaces will be a maximum of 20 calendar days. Commencement of such work will be considered to have occurred when the original stabilizing ground cover has been removed, including grubbing, or has been covered with fill material. Completion of such work will be considered to have occurred when the cover material (seed and mulch, seed and erosion control blanket, sod, rip-rap) has been applied. Where the timing of the operation results in a conflict with the application requirements of the specified cover, the owner / operator will determine appropriate interim measures that afford temporary protection until such a time as final cover can be applied.		

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
• **Boreal Caribou**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Linear barriers—Roads and snowbanks on site roads and the access road could decrease habitat connectivity and adversely affect ungulate distribution and survival.	• Along the Project right-of-way and the access roads, maintain gaps in road berms and snowbanks to facilitate wildlife crossing at drainages, wildlife trails, strategic crossing points informed by movement data and Indigenous Knowledge, or connected habitat patches so that ungulate movements across roads are not blocked. • Snowbanks will be limited as much as possible and to a height of less than 1.6 metres. • Snow clearing along the road will incorporate road pull-outs at regular intervals to provide refuge for wildlife moving along the Community Access Road corridor. • Traffic speeds during Operations will be posted and enforced. • The time that Maintenance materials are left on the ground will be minimized to limit physical barriers to movement.	• Residual changes in habitat connectivity and associated caribou and moose distribution and survival due to linear barriers	• Context: Ecological • Direction: Negative • Magnitude: High • Geographic Extent: Local for habitat availability; Regional to beyond regional for habitat distribution and survival and reproduction (habitat and population connectivity and animal movement) • Duration / Reversibility: Long term / Irreversible (for the Community Access Road and permanent access roads); Long term / Reversible (for access roads that will be revegetated) • Frequency: Continuous • Likelihood: Probable • Significance: Caribou Regional Study Area: Significant; Missisa range: Significant; Nipigon range: Significant; Ozhiski range: Significant; Pagwachuan range: Not significant • Uncertainty: High • Direct / Indirect: Direct
• **Boreal Caribou**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching)	• Construction	• Increased predator access—Increased access for predators (for example, wolf and black bear) and prey may increase predation risk and decrease survival and reproduction for moose and caribou.	• Environmental approval conditions, permits, or authorizations issued for Construction, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources will be followed. • Locate the Project route in such a way that minimizes overlap with sensitive habitats to the extent feasible, including provincially identified Category 1 areas for caribou (nursery areas, winter use areas, travel corridors; Government of Ontario, 2013a) and potential new Category 1 areas identified in this Environmental Assessment / Impact Statement, areas which contain biophysical habitat attributes for caribou (Environment and Climate Change Canada, 2020), and significant wildlife habitat for moose. • The Project footprint is designed to minimize vegetation clearing and access road requirements to the extent feasible (for example, concentrate temporary activities spatially, retain habitat outside of scoped Construction Disturbance Area, restrict	• Residual changes to predation risk and survival and reproduction from increased predator access	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Possible • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Indirect

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
				construction vehicle traffic to established access roads where feasible). • Restrict wildlife access to waste (for example, collect domestic and industrial waste and store in temporary containers until transported offsite, empty chemical toilets regularly, prohibit littering, prohibit feeding and harassment of wildlife). • Design and construct temporary linear features to decrease predator efficiency (for example, retain vegetation under 2 metres, minimize width of linear features, switch backs and bends in temporary road construction), and reduce predator mobility (for example, not removing snow unless necessary). • During construction, the ongoing use of inactive areas by predators will be minimized through physical control measures such as rollback, removal of creek crossings, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access. • Progressive reclamation and revegetation would be implemented as non-permanent features would be decommissioned and reclaimed or revegetated naturally. • To minimize ongoing attraction of predators to the Project area, roadkill will be cleaned up following best management practices outlined by Ontario's Ministry of Transportation and wildlife access to waste will be restricted.		
• **Boreal Caribou**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Increased predator access—Increased access for predators (for example, wolf and black bear) and prey may increase predation risk and decrease survival and reproduction for moose and caribou.	• Restrict wildlife access to waste (for example, collect domestic and industrial waste and store in temporary containers until transported offsite, empty chemical toilets regularly, prohibit littering, prohibit feeding and harassment of wildlife). • During Operations, the ongoing use of inactive areas by predators will be minimized through physical control measures such as rollback, removal of creek crossings, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access. • To minimize ongoing attraction of predators to the Project area, roadkill will be cleaned up following best management practices outlined by Ontario's Ministry of Transportation and wildlife access to waste will be restricted.	• Residual changes to predation risk and survival and reproduction from increased predator access	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration / Reversibility: Long term / Irreversible (for the Community Access Road and permanent access roads); Long term / Reversible (for access roads that will be revegetated) • Frequency: Continuous • Likelihood: Probable • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Indirect

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
• **Boreal Caribou**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls)	• Construction	• Increase in public access—Could affect ungulate survival and reproduction through legal and illegal hunting.	• Environmental approval conditions, permits, or authorizations issued for Construction, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources will be followed. • The Project footprint is designed to minimize vegetation clearing and access road requirements to the extent feasible (for example, concentrate temporary activities spatially, retain habitat outside of scoped Construction Disturbance Area, restrict construction vehicle traffic to established access roads where feasible). • Implement an Environmental Protection Plan that includes measures to control, and / or restrict public use of access roads during construction. Measures will include gates / manned gates, signage, reduced road standard, reduced speed limits, felling of timber across temporary access roads after reclaimed, removal of temporary watercourse crossings. Posting and enforcement of restricted access and speed signage will follow the Construction Specification for Temporary Traffic Control Devices (Ministry of Transportation, 2025). • The Environmental Protection Plan will also outline measures to minimize wildlife-human interactions during construction, including an education program that details to staff, owner / operator s, and visitors how to take all reasonable precautions to avoid wildlife conflicts, mandatory encounter and incident reporting, and signage identifying dangers of discharging firearms near industrial activity. • During construction, employees will be prohibited from personal use of motorized recreational vehicles and will be prohibited from hunting or carrying firearms. • During construction, the ongoing use of inactive areas by the public will be minimized through physical control measures such as rollback, removal of creek crossings, felling of timber across temporary access roads, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access. • Progressive restoration and revegetation would be implemented as non-permanent features would be decommissioned and restored or revegetated naturally.	• Residual changes to survival and reproduction from increased public access and legal and illegal hunting	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Unlikely • Significance: Not significant • Uncertainty: High • Direct / Indirect: Direct

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
• **Boreal Caribou**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Increase in public access—Could affect ungulate survival and reproduction through legal and illegal hunting.	• During Operations, the Community Access Road will be accessible to the public but access roads for aggregate areas and other infrastructure required for maintenance activities will be gated to limit public access. • During Operations, employees will be prohibited from hunting or carrying firearms while conducting maintenance activities. • During Operations, the ongoing use of inactive areas by the public will be minimized through physical control measures such as rollback, removal of creek crossings, felling of timber across temporary access roads, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access.	• Residual changes to survival and reproduction from increased public access and legal and illegal hunting	• Context: Ecological • Direction: Negative • Magnitude: Low • Geographic Extent: Local • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Possible • Significance: Not significant • Uncertainty: High • Direct / Indirect: Direct
• **Boreal Caribou**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Pits and quarries • Temporary concrete batch plants • Drilling / blasting aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Collision with vehicles and equipment—Vehicle or heavy equipment use may cause injury or mortality to individual caribou and moose.	• Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed. • The Project footprint is designed to minimize access road requirements to the extent feasible (for example, concentrate temporary activities spatially, restrict construction vehicle traffic to established access roads where feasible). • Collision risk during construction will be minimized with implementation of the Environmental Protection Plan, which includes measures to minimize collisions between wildlife and vehicles during construction. Measures will include an education program that details to staff, owner / operators, and visitors how to take all reasonable precautions to avoid wildlife collisions. In addition, the Environmental Protection Plan will include measures such as: – Giving wildlife the right-of-way. – Signage in areas where wildlife are regularly observed. – Radio communication between staff of wildlife presence in construction area. – Coordinating worker transportation to site to reduce traffic volumes, where practicable. – Confining vehicle traffic to approved right-of-way, workspace and access roads. – Leaving gaps in road berms and snowbanks to allow for movement across the construction area.	• Residual changes to injury or mortality from collisions with vehicles and equipment	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Possible • Significance: Not significant • Uncertainty: High • Direct / Indirect: Direct

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
				– Restrictions on the use of motorized recreational vehicles by employees and owner / operators while working, including prohibition of personal snowmobiles, all-terrain vehicles and other motorized recreational vehicles, except for authorized purposes. – Mandatory encounter and incident reporting. – Reduced and enforced speed limits. • During construction, heavy trucks will be travelling at reduced speeds and will be adjusted according to conditions (for example, wildlife in the area, weather conditions). • Along the Project right-of-way and the access roads, gaps will be maintained in road berms and snowbanks to facilitate wildlife crossing at drainages, wildlife trails, strategic crossing points informed by movement data and Indigenous Knowledge, or connected habitat patches so that ungulate movements across roads are not blocked. • Snow clearing along the access roads would incorporate road pull-outs at regular intervals to provide refuge for wildlife moving along the Community Access Road corridor. • During construction, the ongoing use of inactive areas by the public will be minimized through physical control measures such as rollback, removal of creek crossings, felling of timber across temporary access roads, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access. Progressive reinstatement and revegetation would be implemented as non-permanent features would be decommissioned and restored or revegetated naturally.		
• **Boreal Caribou**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Collision with vehicles and equipment—Vehicle or heavy equipment use may cause injury or mortality to individual caribou and moose.	• Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during Operations. • During Operations, mitigation measures applicable to non-commercial traffic will include signage in areas where wildlife are regularly observed and reduced speed limits in Category 1 caribou habitat areas. Additional mitigation for commercial traffic will include reduced and enforced speed limits on the entire road, communication of wildlife presence between drivers, and mandatory reporting of wildlife incidents.	• Residual changes to injury or mortality from collisions with vehicles and equipment	• Context: Ecological • Direction: Negative • Magnitude: Moderate • Geographic Extent: Local • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Probable • Significance: Not significant • Uncertainty: High • Direct / Indirect: Direct

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
				• Gaps in snowbanks will be ploughed at least every 1 kilometre apart and maintained by road maintenance crews throughout the winter season. • Access roads for aggregate areas and other infrastructure required for maintenance activities will be gated to limit public access. • During Operations, the ongoing use of inactive areas by the public will be minimized through physical control measures such as rollback, removal of creek crossings, felling of timber across temporary access roads, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access. Progressive reinstatement and revegetation would be implemented as non-permanent features would be decommissioned and restored or revegetated naturally.		
• **Moose**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Pits and quarries • Temporary concrete batch plants • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Habitat loss—The loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence ungulate abundance and distribution.	• Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during construction. • Locate the Project route in such a way that minimizes overlap with sensitive habitats to the extent feasible, including provincially identified Category 1 areas for caribou (nursery areas, winter use areas, travel corridors; Government of Ontario, 2013), areas which contain biophysical habitat attributes for caribou (Environment and Climate Change Canada, 2020), and significant wildlife habitat for moose. • The Project footprint is designed to minimize vegetation clearing and access road requirements to the extent feasible (for example, concentrate temporary activities spatially, retain habitat outside of scoped Construction Disturbance Area, restrict construction vehicle traffic to established access roads where feasible). • Limit to the extent feasible the construction of temporary (for example, access roads) and permanent structures in wetlands or within a 30-metre setback from a wetland. If construction cannot avoid wetlands or the 30-metre setback, the Ministry of Natural Resources will be notified as soon as possible prior to work starting. Work may will not be conducted unless approval is obtained from the appropriate regulatory agencies.	• Residual changes in habitat availability, use, connectivity, and abundance and distribution of caribou and moose due to habitat loss	• Context: Ecological • Direction: Negative • Magnitude: Low • Geographic Extent: Local for habitat availability and survival and reproduction; Regional for habitat distribution (habitat connectivity and animal movement) • Duration / Reversibility: Long term / Irreversible (permanent) • Frequency: Continuous • Likelihood: Certain for habitat availability; Probable for habitat distribution (habitat connectivity and movement) and survival and reproduction • Significance: Not significant • Uncertainty: Low for habitat availability and survival and reproduction; Moderate for habitat distribution (habitat connectivity and animal movement) • Direct / Indirect: Direct

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
				• Construction of the Community Access Road will be conducted in phases (segment by segment) to limit the amount of disturbance at any particular time. • The Construction schedule will avoid activities during the sensitive timing windows for caribou (May 1 to September 15 for nursery areas, December 1 to March 31 for winter use areas) in known and potential new Category 1 areas, to the extent practical. When activity restrictions cannot be followed, the Ministry of the Environment, Conservation and Parks will be engaged to determine alternative approaches. • Retain function, quality and connectivity of compatible habitat features (for example, vegetation, trees, wildlife trees, coarse woody debris) as much as possible, particularly in selective, environmentally sensitive areas, to the extent practical and where safe to do so (for example, using proper setbacks of key habitat features, avoid severe water fluctuations, avoid terrestrial islands, avoid mineral licks, avoid unburned areas within wildfire perimeters, avoid migratory pathways). • Limit clearing of riparian vegetation (within 30 metres of waterbodies) to the extent practical and to the requirement of the access road and alignment clearing width only. • Known sensitive ecological features will be clearly marked (for example, wetlands and significant wildlife habitat) with associated setbacks. Engage with applicable government agency (Ministry of the Environment, Conservation and Parks, Ministry of Natural Resources and Environment and Climate Change Canada) if sensitive ecological features are encountered or cannot be avoided. • Use construction practices which encourage the eventual natural recovery / growth of native species (for example, winter exploration programs on frozen ground with no ripping or grubbing soil). • Maintain or improve ungulate habitat by using techniques that accelerate revegetation (for example, minimize topsoil removal, preserve adequate substrate, leave surface vegetation root mat intact). • Where possible, schedule work activities in wet areas during frozen conditions.		

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
				• Under non-frozen conditions and where regulatory approvals allow, install mats (for example, rig mats, swamp mats or access mats) to limit effects on waterbodies and wetlands, if warranted and surface conditions require. • A Vegetation Management Plan including measures to protect rare plants and rare vegetation communities will be developed and implemented by the owner / operator. In the event a rare plant species or a rare vegetation community are encountered unexpectedly, or cannot be avoided, the rare plant protection measures outlined in the Vegetation Management Plan will be implemented. • Erosion control practices (for example, contouring) will limit wind and water erosion on cover soil and overburden stockpiles (for example, vegetation, erosion mats) as well as will encourage regrowth of vegetation. • Prevent starting wildfires from Project activities (for example, have readily available fire extinguishers, firefighting equipment, water packs / pails, provide firefighting training to staff, keep equipment clean and in good condition, no smoking outside designated areas, prepare an Emergency Response Plan). • Use progressive restoration and adopt practices to facilitate conifer recovery (for example, elevate mulching drums) on site once temporary construction areas are no longer needed. • Avoid re-entry and disturbance of reclaimed temporary access areas through combined use of physical control measures (rollback, remove of creek crossings, recontouring to surrounding topography, revegetation / reforesting and / or barriers at junctions with active access). • Reclaim temporary access roads, construction camps, waterbody crossings and laydown areas at the end of construction. • An Environmental Protection Plan and a Cleanup and Reclamation Plan will be developed and implemented. Where necessary, seedling planting will occur to improve restoration success on areas of temporary disturbance (for example, temporary access roads, laydown areas, camps, and workspaces) where habitat enhancement is identified. Reclamation plans will be confirmed through engagement with Indigenous		

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
				communities, the Ministry of Natural Resources and local foresters. Effectiveness of revegetation efforts will be monitored and managed post-construction, including confirmation that vegetation communities that naturally regenerate (or were planted) are similar to adjacent vegetation communities. If required, adaptive management will be employed to modify or enhance any reclamation efforts. • Restore on site should consider maintaining or improving wildlife habitat. Consider planting native trees, preferably conifers, to accelerate revegetation of the access roads and other temporary disturbances (or progressive reclamation through project life cycle). • A comprehensive list of mitigation measures to control weeds during construction and operations is provided in the Vegetation Technical Support Document (Appendix J) and Peatlands Technical Support Document (Appendix I).		
• **Moose**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Habitat loss—The loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence ungulate abundance and distribution.	• Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources will be followed during Operations. • Maintenance activities with high levels of disturbance will avoid the sensitive timing windows for caribou (May 1 to September 15 for nursery areas, December 1 to March 31 for winter use areas) in known and potential new Category 1 areas, to the extent practical. When activity restrictions cannot be followed, the Ministry of the Environment, Conservation and Parks will be engaged to determine alternative approaches. • Complete maintenance work as quickly as possible to shorten the duration of disturbance. • Ongoing use of inactive areas will be prevented through combined use of physical control measures (rollback, remove of creek crossings, recontouring to surrounding topography, revegetation / reforesting and / or barriers at junctions with active access). • Avoid re-entry and disturbance of reclaimed temporary access areas through combined use of physical control measures (rollback, remove of creek crossings, recontouring to surrounding topography, revegetation / reforesting and / or barriers at junctions with active access).	• Residual changes in habitat availability, use, connectivity, and abundance and distribution of caribou and moose due to habitat loss	• Context: Ecological • Direction: Negative • Magnitude: Low • Geographic Extent: Local for habitat availability and survival and reproduction; Regional for habitat distribution (caribou movement and connectivity). • Duration / Reversibility: Long term / Irreversible (permanent features such as the Community Access Road); Long term / Reversible (temporary features such as access roads, construction camps) • Frequency: Continuous • Likelihood: Certain for habitat availability; Probable for habitat distribution (habitat connectivity and movement) and survival and reproduction • Significance: Not significant • Uncertainty: Low for habitat availability and survival and reproduction; Moderate for habitat distribution (habitat connectivity and animal movement) • Direct / Indirect: Direct

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
• **Moose**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Pits and quarries • Temporary concrete batch plants • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Habitat alteration—Alteration of final terrain and soil conditions, and / or plant species composition, could change the types of ecosystems that can be reclaimed on the landscape and adversely affect ungulate habitat availability and distribution, and survival and reproduction.	• Follow the Construction mitigation measures for habitat loss. • Concentrate activities spatially and temporally to minimize fragmentation and barriers to movement. • Minimize elevation and slope of soil piles and berms to allow ungulates to have clear line of sight to adjacent habitat. • Along the Project right-of-way and the access roads, maintain gaps in road berms and snowbanks to facilitate wildlife crossing at drainages, wildlife trails, strategic crossing points informed by movement data and Indigenous Knowledge, or connected habitat patches so that ungulate movements across roads are not blocked.	• Residual changes in habitat availability and distribution and survival and reproduction due to habitat alteration	• Context: Ecological • Direction: Negative • Magnitude: Low • Geographic Extent: Local for habitat availability and survival and reproduction; Regional for habitat distribution (habitat connectivity and animal movement) • Duration / Reversibility: Long term / Irreversible (permanent) • Frequency: Continuous • Likelihood: Certain for habitat availability; Probable for habitat distribution (habitat connectivity and movement) and survival and reproduction • Significance: Not significant • Direct / Indirect: Direct
• **Moose**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Habitat alteration—Alteration of final terrain and soil conditions, and / or plant species composition, could change the types of ecosystems that can be reclaimed on the landscape and adversely affect ungulate habitat availability and distribution, and survival and reproduction.	• Follow the Operations mitigation measures for habitat loss.	• Residual changes in habitat availability and distribution and survival and reproduction due to habitat alteration	• Context: Ecological • Direction: Negative • Magnitude: Low • Geographic Extent: Local for habitat availability and survival and reproduction; Regional for habitat distribution (caribou movement and connectivity). • Duration / Reversibility: Long term / Irreversible (permanent features such as the Community Access Road); Long term / Reversible (temporary features such as access roads, construction camps) • Frequency: Continuous • Likelihood: Certain for habitat availability; Probable for habitat distribution (habitat connectivity and movement) and survival and reproduction • Significance: Not significant • Uncertainty: Low for habitat availability and survival and reproduction; Moderate for habitat distribution (habitat connectivity and animal movement) • Direct / Indirect: Direct

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
• **Moose**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Pits and quarries • Temporary concrete batch plants • Drilling / blasting aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Sensory disturbance—(for example, lights, smells, noise, human activity) can alter ungulate habitat availability, use and connectivity (movement and behaviour), which can lead to changes in abundance and distribution and adversely affect survival and reproduction.	• A comprehensive list of mitigation measures to minimize effects from noise during construction is provided in the Acoustic and Vibration Environment Technical Support Document (Appendix P). • Environmental approval conditions, permits, or authorizations issued for Construction, including those issued from Fisheries and Oceans Canada, Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed. • Locate the Project route in such a way that minimizes overlap with sensitive habitats to the extent feasible, including provincially identified Category 1 areas for caribou (nursery areas, winter use areas, travel corridors; Government of Ontario, 2013a), areas which contain biophysical habitat attributes for caribou (Environment and Climate Change Canada, 2020), and significant wildlife habitat for moose. • Construction of the Community Access Road will be conducted in phases to limit the amount of disturbance at any particular time. • Construction will be completed as quickly as possible to shorten the duration of disturbance. • The Construction schedule will avoid activities during the sensitive timing windows for caribou (May 1 to September 15 for nursery areas, December 1 to March 31 for winter use areas) in known and potential new Category 1 areas, to the extent practical. When activity restrictions cannot be followed, the Ministry of the Environment, Conservation and Parks will be engaged to determine alternative approaches. • An Environmental Protection Plan will be developed and implemented that includes measures to limit noise disturbance from construction activities; this includes prohibiting use of engine retarder brakes, enforcing speed limits, reducing idling of vehicles, designing routes to minimize reversing (backup beeper), reducing traffic by locating camps near construction sites, and restricting construction traffic to designated areas and only construction personnel. • Noise abatement, emission and pollution control equipment on machinery will be in place, properly maintained and in good working order.	• Residual changes in habitat availability, use and connectivity (movement and behaviour), which can lead to changes in abundance and distribution and adversely affect survival and reproduction due to sensory disturbance	• Context: Ecological • Direction: Negative • Magnitude: Low • Geographic Extent: Local for habitat availability and survival and reproduction; Regional for habitat distribution (habitat connectivity and animal movement). • Duration / Reversibility: Long term / Reversible • Frequency: Continuous • Likelihood: Certain • Significance: Not significant • Uncertainty: Low for habitat availability and survival and reproduction; Moderate for habitat distribution (habitat connectivity and animal movement) • Direct / Indirect: Indirect

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
				• Limit aerial operations when possible. When not feasible, a minimum ferry altitude of 400 metres above ground level will be maintained during sensitive timing periods to reduce sensory disturbance on caribou. • Limit light disturbance from nighttime operational activities by using directional lighting. Lighting required for Construction, including direction and timing to avoid effects on ungulates, will be controlled while meeting operational health and safety requirements. • Industry best practices will be used for blasting activities, including scheduling when in the vicinity of sensitive wildlife habitat areas. Forest buffers (30 metres width) will be retained around quarries to reduce noise, where feasible. • Prevent ongoing use of inactive areas through combined use of physical control measures (rollback, remove of creek crossings, recontouring to surrounding topography, revegetation / reforesting and / or barriers at junctions with active access).		
• **Moose**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Sensory disturbance—(for example, lights, smells, noise, human activity) can alter ungulate habitat availability, use and connectivity (movement and behaviour), which can lead to changes in abundance and distribution and adversely affect survival and reproduction.	• A comprehensive list of mitigation measures to minimize effects from noise during Operations is provided in the Acoustic and Vibration Environment Technical Support Document (Appendix P). • Environmental approval conditions, permits, or authorizations issued for Operations, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed. • Maintenance work will be completed as quickly as possible to shorten the duration of disturbance. • The Environmental Protection Plan will be implemented to minimize sensory disturbance by owner / operators during Operations, including prohibiting use of engine retarder brakes, enforcing speed limits, and restricting maintenance traffic to designated areas. • Aerial operations will be limited when possible; when not feasible, minimum ferry altitude of 400 metres above ground level will be maintained during sensitive timing periods to reduce sensory disturbance on caribou.	• Residual changes in habitat availability, use and connectivity (movement and behaviour), which can lead to changes in abundance and distribution and adversely affect survival and reproduction due to sensory disturbance	• Context: Ecological • Direction: Negative • Magnitude: Low • Geographic Extent: Local for habitat availability and survival and reproduction; Regional for habitat distribution (habitat connectivity and animal movement). • Duration / Reversibility: Long term / Irreversible to Short term / Reversible (if moose habituate to vehicle traffic) • Frequency: Continuous • Likelihood: Probable • Significance: Not significant • Uncertainty: Low for habitat availability and survival and reproduction; Moderate for habitat distribution (habitat connectivity and animal movement) • Direct / Indirect: Indirect

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
				• Lighting required for Operations, including direction and timing to avoid effects on ungulates, will be controlled while meeting operational health and safety requirements. • Prevent ongoing use of inactive areas through combined use of physical control measures (rollback, remove of creek crossings, recontouring to surrounding topography, revegetation / reforesting and / or barriers at junctions with active access). • Speed limits will be enforced to reduce noise associated with vehicle traffic.		
• **Moose**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Linear barriers—Roads and snowbanks on site roads and the access road could decrease habitat connectivity and adversely affect ungulate distribution and survival.	• Environmental approval conditions, permits, or authorizations issued for Construction, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources will be followed. • Locate the Project route in such a way that minimizes overlap with sensitive habitats to the extent feasible, including provincially identified Category 1 areas for caribou (nursery areas, winter use areas, travel corridors; Government of Ontario, 2013), areas which contain biophysical habitat attributes for caribou (Environment and Climate Change Canada, 2020), and significant wildlife habitat for moose. • The Project footprint is designed to minimize vegetation clearing and access road requirements to the extent feasible (for example, concentrate temporary activities spatially, retain habitat outside of scoped Construction Disturbance Area, restrict construction vehicle traffic to established access roads where feasible). • Construction will be conducted in phases to concentrate activities spatially and temporally to minimize fragmentation and barriers to movement across the landscape. • Limit to the extent practicable the construction of temporary (for example, access road, travel lane) and permanent structures in wetlands or within 30 metres setback from a wetland. If construction cannot avoid wetlands and 30 metres setback, Ministry of Natural Resources will be notified as soon as possible prior to work starting. Work may will not be conducted unless approval is obtained from the appropriate regulatory agencies.	• Residual changes in habitat connectivity and associated caribou and moose distribution and survival due to linear barriers	• Context: Ecological • Direction: Negative • Magnitude: Low • Geographic Extent: Local for habitat availability and survival and reproduction; Regional for habitat distribution (habitat connectivity and animal movement). • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Probable • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Direct

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
				• Concentrate activities spatially and temporally to minimize fragmentation and barriers to movement across the landscape. • Minimize elevation and slope of soil piles and berms to allow ungulates to have clear line of sight to adjacent habitat. • Along the Project right-of-way and the access roads, maintain gaps in road berms and snowbanks to facilitate wildlife crossing at drainages, wildlife trails, strategic crossing points informed by movement data and Indigenous Knowledge, or connected habitat patches so that ungulate movements across roads are not blocked. • Snowbanks will be limited as much as possible and to a height of less than 1.6 metres. • Snow clearing along the access roads will incorporate road pull-outs at regular intervals to provide refuge for wildlife moving along the Community Access Road corridor. • Traffic speeds during construction will be posted. Speeds will be determined by temporary access road conditions and the discretion of the constructing owner / operator. • Vehicular traffic will be confined to approved right-of-way, workspace and access roads or trails. • The time that road Construction materials are left on the ground will be minimized to limit physical barriers to movement. • Use progressive restoration on site once staging areas are no longer needed and prevent ongoing use of inactive areas through combined use of physical control measures (rollback, remove of creek crossings, recontouring to surrounding topography, revegetation / reforesting and / or barriers at junctions with active access).		
• **Moose**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Linear barriers—Roads and snowbanks on site roads and the access road could decrease habitat connectivity and adversely affect ungulate distribution and survival.	• Along the Project right-of-way and the access roads, maintain gaps in road berms and snowbanks to facilitate wildlife crossing at drainages, wildlife trails, strategic crossing points informed by movement data and Indigenous Knowledge, or connected habitat patches so that ungulate movements across roads are not blocked. • Snowbanks will be limited as much as possible and to a height of less than 1.6 metres. • Snow clearing along the road will incorporate road pull-outs at regular intervals to provide	• Residual changes in habitat connectivity and associated caribou and moose distribution and survival due to linear barriers	• Context: Ecological • Direction: Negative • Magnitude: Low • Geographic Extent: Local for habitat availability and survival and reproduction; Regional for habitat distribution (habitat connectivity and animal movement). • Duration / Reversibility: Long term / Irreversible (for the Community Access Road and

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
				refuge for wildlife moving along the Community Access Road corridor. • Traffic speeds during Operations will be posted and enforced. • The time that Maintenance materials are left on the ground will be minimized to limit physical barriers to movement. I		permanent access roads); Long term / Reversible (for access roads that become revegetated) • Frequency: Continuous • Likelihood: Probable • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Direct
• **Moose**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching)	• Construction	• Increased predator access—Increased access for predators (for example, wolf and black bear) and prey may increase predation risk and decrease survival and reproduction for moose and caribou.	• Environmental approval conditions, permits, or authorizations issued for Construction, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources will be followed. • Locate the Project route in such a way that minimizes overlap with sensitive habitats to the extent feasible, including provincially identified Category 1 areas for caribou (nursery areas, winter use areas, travel corridors; Government of Ontario, 2013a) and potential new Category 1 areas identified in this Environmental Assessment / Impact Statement, areas which contain biophysical habitat attributes for caribou (Environment and Climate Change Canada, 2020), and significant wildlife habitat for moose. • The Project footprint is designed to minimize vegetation clearing and access road requirements to the extent feasible (for example, concentrate temporary activities spatially, retain habitat outside of scoped Construction Disturbance Area, restrict construction vehicle traffic to established access roads where feasible). • Restrict wildlife access to waste (for example, collect domestic and industrial waste and store in temporary containers until transported offsite, empty chemical toilets regularly, prohibit littering, prohibit feeding and harassment of wildlife). • Design and construct temporary linear features to decrease predator efficiency (for example, retain vegetation under 2 metres, minimize width of linear features, switch backs and bends in temporary road construction), and reduce predator mobility (for example, not removing snow unless necessary). • During construction, the ongoing use of inactive areas by predators will be minimized through physical control measures such as rollback,	• Residual changes to predation risk and survival and reproduction from increased predator access	• Context: Ecological • Direction: Negative • Magnitude: Low • Geographic Extent: Local • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Possible • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Indirect

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
				removal of creek crossings, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access. • Progressive restoration and revegetation would be implemented as non-permanent features would be decommissioned and restored or revegetated naturally. The time interval between commencement and completion of any work that disturbs earth surfaces will be a maximum of 20 calendar days. Commencement of such work will be considered to have occurred when the original stabilizing ground cover has been removed, including grubbing, or has been covered with fill material. Completion of such work will be considered to have occurred when the cover material (seed and mulch, seed and erosion control blanket, sod, rip-rap) has been applied. Where the timing of the operation results in a conflict with the application requirements of the specified cover, the owner / operator will determine appropriate interim measures that afford temporary protection until such a time as final cover can be applied. • To minimize ongoing attraction of predators to the Project area, road kill will be cleaned up following best management practices outlined by Ontario's Ministry of Transportation and wildlife access to waste will be restricted.		
• **Moose**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Increased predator access—Increased access for predators (for example, wolf and black bear) and prey may increase predation risk and decrease survival and reproduction for moose and caribou.	• Restrict wildlife access to waste (for example, collect domestic and industrial waste and store in temporary containers until transported offsite, empty chemical toilets regularly, prohibit littering, prohibit feeding and harassment of wildlife). • During Operations, the ongoing use of inactive areas by predators will be minimized through physical control measures such as rollback, removal of creek crossings, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access. • To minimize ongoing attraction of predators to the Project area, road kill will be cleaned up following best management practices outlined by Ontario's Ministry of Transportation and wildlife access to waste will be restricted.	• Residual changes to predation risk and survival and reproduction from increased predator access	• Context: Ecological • Direction: Negative • Magnitude: Low • Geographic Extent: Local • Duration / Reversibility: Long term / Irreversible (for the Community Access Road and permanent access roads); Long term / Reversible (for access roads that will be revegetated) • Frequency: Continuous • Likelihood: Probable • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Indirect

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
• **Moose**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls)	• Construction	• Increase in public access—Could affect ungulate survival and reproduction through legal and illegal hunting.	• Environmental approval conditions, permits, or authorizations issued for Construction, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources will be followed. • The Project footprint is designed to minimize vegetation clearing and access road requirements to the extent feasible (for example, concentrate temporary activities spatially, retain habitat outside of scoped Construction Disturbance Area, restrict construction vehicle traffic to established access roads where feasible). • Implement an Environmental Protection Plan that includes measures to control, and / or restrict public use of access roads during construction. Measures may include gates / manned gates, signage, reduced road standard, reduced speed limits, felling of timber across temporary access roads after reclaimed, removal of temporary watercourse crossings. Posting and enforcement of restricted access and speed signage will follow the Construction Specification for Temporary Traffic Control Devices (Ontario Provincial Standard Specification, 2016). Marten Falls First Nation continues to engage in discussions with the Province regarding the ownership and future operations of the Community Access Road. Access and ownership including gating security / ID system, are not within the scope of the EA/IS, however it is a matter that will require further dialogue between the communities and the Province. • The Environmental Protection Plan will also outline measures to minimize wildlife-human interactions during construction, including an education program that details to staff, owner / operators, and visitors how to take all reasonable precautions to avoid wildlife conflicts, mandatory encounter and incident reporting, and signage identifying dangers of discharging firearms near industrial activity. • During construction, employees will be prohibited from personal use of motorized recreational vehicles and will be prohibited from hunting or carrying firearms. • During construction, the ongoing use of inactive areas by the public will be minimized through	• Residual changes to survival and reproduction from increased public access and legal and illegal hunting	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Unlikely • Significance: Not significant • Uncertainty: Medium • Direct / Indirect: Indirect

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
				physical control measures such as rollback, removal of creek crossings, felling of timber across temporary access roads, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access. • Progressive restoration and revegetation would be implemented as non-permanent features would be decommissioned and restored or revegetated naturally. The time interval between commencement and completion of any work that disturbs earth surfaces will be a maximum of 20 calendar days. Commencement of such work will be considered to have occurred when the original stabilizing ground cover has been removed, including grubbing, or has been covered with fill material. Completion of such work will be considered to have occurred when the cover material (seed and mulch, seed and erosion control blanket, sod, rip-rap) has been applied. Where the timing of the operation results in a conflict with the application requirements of the specified cover, the owner / operator will determine appropriate interim measures that afford temporary protection until such a time as final cover can be applied.		
• **Moose**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Increase in public access—Could affect ungulate survival and reproduction through legal and illegal hunting.	• Marten Falls First Nation continues to engage in discussions with the Province regarding the ownership and future operations of the Community Access Road. Access and ownership including gating security / ID system, will require further dialogue between the communities and the Province. • During Operations, employees will be prohibited from hunting or carrying firearms while conducting maintenance activities. • During Operations, the ongoing use of inactive areas by the public will be minimized through physical control measures such as rollback, removal of creek crossings, felling of timber across temporary access roads, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access.	• Residual changes to survival and reproduction from increased public access and legal and illegal hunting	• Context: Ecological • Direction: Negative • Magnitude: High • Geographic Extent: Regional (localized within and surrounding the ungulate effects assessment Local Study Area) • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Probable • Significance: Significant • Uncertainty: High • Direct / Indirect: Indirect

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
• **Moose**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of-way clearing and grubbing • Pits and quarries • Temporary concrete batch plants • Drilling / blasting aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resources Act* • Decommissioning of temporary camps, roads / trails and staging areas	• Construction	• Collision with vehicles and equipment—Vehicle or heavy equipment use may cause injury or mortality to individual caribou and moose.	• Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed. • The Project footprint is designed to minimize access road requirements to the extent feasible (for example, concentrate temporary activities spatially, restrict construction vehicle traffic to established access roads where feasible). • Collision risk during construction will be minimized with implementation of the Environmental Protection Plan, which includes measures to minimize collisions between wildlife and vehicles during construction. Measures will include an education program that details to staff, owner / operators, and visitors how to take all reasonable precautions to avoid wildlife collisions. In addition, the Environmental Protection Plan will include measures such as: – Giving wildlife the right-of-way. – Signage in areas where wildlife are regularly observed. – Radio communication between staff of wildlife presence in construction area. – Coordinating worker transportation to site to reduce traffic volumes, where practicable. – Confining vehicle traffic to approved right-of-way, workspace and access roads. – Leaving gaps in road berms and snowbanks to allow for movement across the construction area. • Restrictions on the use of motorized recreational vehicles by employees and owner / operators while working, including prohibition of personal snowmobiles, all-terrain vehicles and other motorized recreational vehicles, except for authorized purposes. • Mandatory encounter and incident reporting. • Reduced and enforced speed limits. • During construction, heavy trucks will be travelling at reduced speeds and will be adjusted according to conditions (for example, wildlife in the area, weather conditions). • Along the Project right-of-way and the access roads, gaps will be maintained in road berms and snowbanks to facilitate wildlife crossing at	• Residual changes to injury or mortality from collisions with vehicles and equipment	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Local • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Possible • Significance: Not significant • Uncertainty: Low • Direct / Indirect: Direct

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
				drainages, wildlife trails, strategic crossing points informed by movement data and Indigenous Knowledge, or connected habitat patches so that ungulate movements across roads are not blocked. • Snow clearing along the access roads would incorporate road pull-outs at regular intervals to provide refuge for wildlife moving along the Community Access Road corridor. • During construction, the ongoing use of inactive areas by the public will be minimized through physical control measures such as rollback, removal of creek crossings, felling of timber across temporary access roads, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access. Progressive reinstatement and revegetation would be implemented as non-permanent features would be decommissioned and restored or revegetated naturally. • Marten Falls First Nation continues to engage in discussions with the Province regarding the ownership and future operations and maintenance of the Community Access Road. Access and ownership including gating security / ID system, will require further dialogue between the communities and the Province.		
• **Moose**	• Operate the Preferred Route • Maintain the Preferred Route	• Operations	• Collision with vehicles and equipment—Vehicle or heavy equipment use may cause injury or mortality to individual caribou and moose.	• Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during Operations. • During Operations, mitigation measures applicable to non-commercial traffic will include signage in areas where wildlife are regularly observed, reduced speed limits in Category 1 caribou habitat areas, and reduced speed limits at the major bridge crossings over the Ogoki River and Albany River where higher moose and bat occurrence is predicted. Additional mitigation for commercial traffic will include reduced and enforced speed limits on the entire road, communication of wildlife presence between drivers, and mandatory reporting of wildlife incidents • Gaps in snowbanks will be ploughed at least every 1 kilometre apart and maintained by road maintenance crews throughout the winter season.	• Residual changes to injury or mortality from collisions with vehicles and equipment	• Context: Ecological • Direction: Negative • Magnitude: Moderate • Geographic Extent: Local • Duration / Reversibility: Long term / Irreversible • Frequency: Continuous • Likelihood: Probable • Significance: Not significant • Uncertainty: High • Direct / Indirect: Direct

Valued Components	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effects	Characterization of Predicted Residual Effect and Determination of Significance
				• Marten Falls First Nation continues to engage in discussions with the Province regarding the ownership and future operations of the Community Access Road. Access and ownership including gating security / ID system, will require further dialogue between the communities and the Province. • During Operations, the ongoing use of inactive areas by the public will be minimized through physical control measures such as rollback, removal of creek crossings, felling of timber across temporary access roads, recontouring to surrounding topography, revegetating / reforesting and / or barriers at junctions with active access. Progressive reinstatement and revegetation would be implemented as non-permanent features would be decommissioned and restored or revegetated naturally. • In the event of a mortality of a species at risk due to collisions with equipment or vehicles during construction and / or operations, the owner / operator and / or operator should report the incident to SAROntario@ontario.ca and the Natural Heritage Information Centre at NHICRequests@ontario.ca.		

9.4.6 Physiography, Terrain and Soils

9.4.6.1 Project-Environment Interactions

As a component of the effects assessment, the Project activities were reviewed to find potential environmental interactions. These interactions were then assessed for potential effect (**Table 9.4-15**).

Table 9.4-15: Project-Environment Interactions - Physiography, Terrain and Soils

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• **Construction**	• Clearing the right-of-way (for example remove and dispose of trees, shrubs, fallen timber, and surface litter, strip organic materials, grub) • Blasting rock (for example remove rock at quarries, and as required, at specific locations in association with road and bridge construction) • Constructing the Community Access Road (for example overburden excavation and removal, excavation of granular material at pits, remove unsuitable soil, place and compact rock and granular material, trim and shape the road, stockpiling of mineral soil and leaf litter [organic material], and soil handling and replacement from stockpiles at decommissioning) • Constructing bridges and installing culverts (for example surface water management and erosion control, dewatering of the watercourses to create ice bridges, alteration of natural drainage systems, watercourse bank grading to improve approaches if required) • Constructing, operating, and decommissioning temporary infrastructure (for example remove temporary culverts and bridges, remediate channels) • Mobilization of equipment, supplies, and personnel (for example haulage of materials, solid and liquid waste management, fuel storage, and hazardous materials handling, sewage and effluent treatment and water storage and effluent monitoring for temporary construction camps)	• Physiography, Terrain and Soils	• Quantity (area in hectares) and distribution of terrain units, which includes surficial materials, topography, and slope stability • Quantity (area in hectares) and distribution of soil map units • Soil quality (in other words, productivity, reclamation suitability)	• The overall effects due to Project-environment interaction during construction can be summarized as follows: • Changes to terrain quantity and distribution from Project activities • Changes to terrain quantity and distribution (esker landforms) from Project activities • Changes to terrain quantity and distribution (slope stability) from Project activities • Changes to soil quantity and distribution from Project activities • Changes to soil quality (compaction and admixing) from Project activities • Changes to soil quality from contamination due to potential leaks or spills of deleterious or hazardous substances from Project activities • Changes to soil quality from the transport and deposition of air contaminant emissions (for example potential acid inputs) and particulate matter (dust) from Project activities
• **Operations**	• Operate the Community Access Road • Maintain the Community Access Road	• Physiography, Terrain and Soils	• Quantity (area in hectares) and distribution of terrain units, which includes surficial materials, topography, and slope stability • Quantity (area in hectares) and distribution of soil map units • Soil quality (in other words, productivity, reclamation suitability)	• Changes to terrain quantity and distribution from Project activities • Changes to terrain quantity and distribution (esker landforms) from Project activities • Changes to terrain quantity and distribution (slope stability) from Project activities • Changes to soil quantity and distribution from Project activities • Changes to soil quality (compaction and admixing) from Project activities • Changes to soil quality from contamination due to potential leaks or spills of deleterious or hazardous substances from Project activities • Changes to soil quality from the transport and deposition of air contaminant emissions (for example potential acid inputs) and particulate matter (dust) from Project activities

9.4.6.2 Discipline-Specific Characteristics

In support of the residual effects characteristics described in **Section 6.7.3**, **Table 6-1**, the following physiography, terrain and soils definitions apply to the effects assessment.

Ecological and Social Context

Ecological context for physiography, terrain, and soils valued components considers resilience, adaptive capacity, status and trends, and applicable legislation and best management practices. The current and future sensitivity and resilience of the physiography, terrain, and soils valued component to change from the Community Access Road, are considered. The ecological context of the effect includes a discussion of the environmental consequences of the predicted effect.

Magnitude

For magnitude, environmental discipline-specific definitions are required and are provided in **Table 9.4-16**. Magnitude of effects are project-related and exclude variations due to climate change.

Table 9.4-16: Physiography, Terrain, and Soils Magnitude Definition

Magnitude Level (Rating)	Magnitude Level (Definition)
• Qualitative narrative or numeric quantification	• Change in measurement indicator is described by effect size (for example hectares of a terrain unit)

While most criteria were assigned categorical ratings, magnitude ratings for physiography, terrain, and soils were provided in specific terms (in other words, narrative or numeric quantification) in the residual effects assessment. Applying a category rating to a criterion such as magnitude might lead to confusion or misinterpretation of the effects assessment or result in the criterion not being easily categorized in a meaningful way. For example, characterizing magnitude solely using an ordinal scale (in other words, low, medium, or high) for physiography, terrain, and soils is often not appropriate as additional context is required to properly characterize the effects. Universal effect size boundaries, such as a 20 percent change in a terrain or soil map unit at the Local Study Area scale used to define a high magnitude effect, work poorly because these size boundaries fail to consider context. Depending on the ecological context, a 20 percent change from existing conditions in the study area may be required to cause a high magnitude effect on some units, whereas a 2 percent change in the study area may be sufficient to cause a high magnitude effect for other

units. When categorical definitions were used, magnitude was classified as negligible, low, medium, or high and supported by a reasoned narrative.

9.4.6.3 Residual Effects - Construction Phase

9.4.6.3.1 Changes to Terrain Quantity and Distribution

9.4.6.3.1.1 Potential Effects

The Project will have a direct effect on terrain in the Construction Disturbance Area during construction due to clearing, earth moving, excavation at pits and / or blasting at quarry sites and other road construction activities. Although excavation at pits and quarries is still anticipated as part of road maintenance activities during operations, for the purposes of the assessment it is assumed that all pit and quarry sites will reach their maximum footprint extent during construction.

Alteration of terrain conditions (in other words, quantity and distribution) within the Construction Disturbance Area may change surface expression, surficial material thickness, or associated soil drainage, and could potentially influence the ability of terrain and soil to support the establishment of plant species and vegetation communities and associated wildlife habitat and species. Indigenous Knowledge from Marten Falls First Nation noted generalized concerns related to the potential for overall landscape disturbances and how these changes might affect their usage of the land (Dillon, 2026a; Marten Falls First Nation, 2019). Marten Falls First Nation also noted that they are concerned about how development will affect their connection to the land, including concerns related to the effects of blasting on cultural / spiritual sites. In particular, community members have noted beliefs that the development will alter the natural landscape, thereby impacting the beauty, tranquility, silence, and special places of Marten Falls First Nation's traditional territory (Marten Falls First Nation, 2023).

9.4.6.3.1.2 Mitigation and Enhancement Measures

Mitigation measures that will be implemented during construction include:

- Limit the Project footprint (Construction Disturbance Area) to the extent practicable;
- Minimize areas of vegetation clearing and soil disturbance and optimize the use of existing cleared areas for Project activity (in other words, site clearing will be kept to a minimum within the Community Access Road right-of-way);

- Develop and implement a Project-specific Soil Management Plan (for example, soil stripping and handling recommendations, erosion and sediment control, reclamation procedures, best management practices and guidelines / policies);
- Minimize stripping and grading of terrain between the height of land (drainage divide) and the watercourse, or within 100 metres of a watercourse crossing, whichever is less, and limit to that required to address engineering issues and safety concerns, such as the removal of hazards. If stripping or grading occurs within such areas, the site will be stabilized;
- Regrade areas with erosional gullies to conform to the local landform to maintain drainage patterns during decommissioning of temporary infrastructure;
- Strip the overburden from bedrock quarry areas before blasting, or excavating and will be managed in accordance with the On-Site and Excess Soil Management Regulation under the Ontario *Environmental Protection Act*; and
- All pits and quarries will be rehabilitated during their operational lifetime and once extraction is finished as per the Ontario Ministry of Natural Resources *Aggregate Resources Act*.

9.4.6.3.1.3 Residual Effects

Reclamation and / or rehabilitation of temporary disturbances is predicted to reverse changes to temporarily disturbed terrain units to sustain productive soils, which would support the establishment and succession of vegetation communities with similar function to existing conditions ecosystems. Rehabilitation in reference to pits and quarries is defined as “the treatment of land from which aggregate has been excavated so that the use or condition of the land is restored to its former use or condition or is changed to another use or condition that is or will be compatible with the use of adjacent land” (Government of Ontario, 1990). The establishment of reclaimed terrain is predicted to occur through the decommissioning activities for temporary infrastructure at the end of construction. The terrain will be reclaimed by regrading the terrain to blend with existing topography and landforms. In a study conducted in central Alberta, Macyk (1986) suggested reconstructed soils are composites of the original soil units and the resultant soil properties are largely controlled by surficial material characteristics (terrain) and material handling procedures. Irreversible residual effects from the Project will remain in 84.6 percent of the Construction Disturbance Area, associated with the areas of permanent disturbance; this change will be brought forward into the Residual Effects Analysis.

Project activities and components would alter terrain conditions (in other words, quantity and distribution), which could subsequently adversely affect soil productivity and the

types of ecosystems that can be re-established on the landscape through reclamation. Project activities that would affect terrain quantity and distribution include land clearing and site preparation for infrastructure and facilities during construction, hauling and deposition of aggregate (for example, bedrock, sand, and gravel), and other materials during construction, and removal of infrastructure and facilities and associated reclamation and revegetation of non-permanent Project components through decommissioning and reclamation activities at the end of construction. As this residual effect is of negligible magnitude and certain to occur, the effect was carried forward into the cumulative effects assessment.

9.4.6.3.2 Changes to Terrain Quantity and Distribution (Esker Landforms)

9.4.6.3.2.1 Potential Effects

Project activities such as constructing the Community Access Road, sand and gravel pit creation and aggregate extraction have the potential to change or remove esker landforms during construction. Although excavation at pits and quarries is still anticipated as part of road maintenance activities during operations, for the purposes of the assessment it is assumed that all pit and quarry sites will reach their maximum footprint extent during construction. Because sand and gravel resources are rare in the effects assessment Local Study Area, the Construction Disturbance Area has been developed to target and include potential esker landforms as a potential aggregate (pit) resource. Indigenous Knowledge from Marten Falls First Nation and Aroland First Nation noted generalized concerns related to the potential for overall landscape disturbances and how these changes might affect their usage of the land (Dillon, 2026a; Dillon, 2026b; Marten Falls First Nation, 2019).

9.4.6.3.2.2 Mitigation and Enhancement Measures

Mitigation and enhancement measures that will be implemented to reduce changes to esker landforms during construction include:

- Minimize or avoid the use of eskers or similar geological features for aggregate resources by using bedrock quarries or other sand and gravel resources whenever possible;
- Confirm suitable aggregate material in ridged landforms prior to extraction; and
- All pits and quarries will be rehabilitated during their operational lifetime and once extraction is finished as per the Ontario Ministry of Natural Resources *Aggregate Resources Act*.

9.4.6.3.2.3 Residual Effects

Within the effects assessment Local Study Area, eleven polygons were mapped and identified as eskers. Of those eleven eskers, five have been identified as potential sand and gravel resources within the Construction Disturbance Area (SG-06, SG-19) and would be permanently disturbed to support road construction and operations. Approximately 45 percent of the esker features identified in the effects assessment Local Study Area will be permanently disturbed, and therefore this effect will be carried forward to the Residual Effects Assessment.

In the effects assessment Local Study Area, five of the eleven polygons (45 percent) identified as eskers would be permanently disturbed or destroyed as they are associated with sand and gravel resources within the Construction Disturbance Area (aggregate pits SG-06 and SG-19). Although the sand and gravel pits are required to be rehabilitated based on the Aggregate Resources act, it is not feasible to recreate an esker landform as the material forming the landform is to be used as an aggregate resource. Therefore, all five esker polygons are considered to be permanently disturbed or destroyed. Although sand and gravel resources are rare in the effects assessment Local Study Area, and knowledge from Marten Falls First Nation and Aroland First Nation noted generalized concerns related to the potential for overall landscape disturbances and how these changes might affect their usage of the land (Dillon, 2024a; Marten Falls First Nation, 2019), fewer than half of these landforms are predicted to be disturbed.

As this residual effect is of medium magnitude and certain to occur, the effect was carried forward into the cumulative effects assessment.

9.4.6.3.3 Changes to Quantity and Distribution of Terrain Units (Slope Stability)

9.4.6.3.3.1 Potential Effects

Project activities such as land clearing, site preparation, pit and quarry development, and earth works during construction have the potential to cause slope instability and increased probability of failure on slopes, especially those adjacent to watercourses or waterbodies.

9.4.6.3.3.2 Mitigation and Enhancement Measures

Mitigation and enhancement measures that will be implemented during construction to reduce changes to terrain stability include:

- Avoid or minimize the amount of area for construction facilities that are considered to have terrain that is either unstable or potentially unstable and design slopes for long-term stability. Stabilize slopes, if required;
- Have construction activities occur under frozen or dry conditions as much as possible;
- Avoid construction on highly saturated soil where practicable or use suitable ground equipment to avoid potentially increasing slope instability;
- Regrade areas with erosional gullies to conform to the local landform to maintain drainage patterns;
- Minimize any exposed mineral soil between the height of land (drainage divide) and the watercourse, or within 100 metres of a watercourse crossing, whichever is less, and limit to that required to address engineering issues and safety concerns, such as the removal of hazards. If stripping or grading occurs within such areas, the site will be left at a stable angle;
- Pit and quarry rehabilitation plans will address final slopes for pit and quarry areas to help maintain stable slopes suitable for reclamation;
- Use low road grades and proper drainage to reduce potential terrain instability, where feasible; and
- Implement progressive reclamation and revegetation of disturbed areas no longer required for construction.

9.4.6.3.3.3 Residual Effects

Terrain in the effects assessment Local Study Area is generally stable with only 64 hectares of terrain identified as being potentially unstable or unstable. Although surficial materials in large portions of the effects assessment Local Study Area have higher potential to be prone to failures, topography in the effects assessment Local Study Area is generally level, with very few areas of slopes steep enough to fail. The potentially unstable or unstable areas were identified almost exclusively adjacent to erosional slopes of watercourses, waterbodies, and peatlands (fens). The implementation of environmental design features, mitigation, and monitoring is expected to avoid adverse residual changes to slope stability potential increased probability of failures; and therefore, this effect was not carried forward to the residual effects assessment.

9.4.6.3.4 Changes to Quantity and Distribution of Soils

9.4.6.3.4.1 Potential Effects

The Project will have direct changes to soil in the Construction Disturbance Area during construction due to clearing, earth moving, pit and quarry development (including excavation and blasting), and other construction activities. Changes to soil conditions (in other words, quantity and distribution) within the Construction Disturbance Area may adversely affect the soils ability to sustain ecosystems. Project activities may affect soil quantity and distribution through an increase in potential soil loss through wind or water erosion, or an alteration of soil map unit distribution.

9.4.6.3.4.2 Mitigation and Enhancement Measures

Mitigation measures that will be implemented during construction to reduce changes to soil quantity and distribution include:

- Limit the Project footprint (Construction Disturbance Area) to the extent practicable;
- Minimize areas of vegetation clearing and soil disturbance and optimize the use of cleared area for Project activity (such as, site clearing will be kept to a minimum within the Community Access Road right-of-way);
- Develop and implement a Project-specific Soil Management Plan (for example, soil stripping and handling recommendations, erosion and sediment control (based on the Ontario Ministry of Transportation's Erosion and Sediment Control Guide), reclamation procedures, best management practices and guidelines / policies);
- Select erosion and sediment control products that correspond with the nature and duration of the Project as recommended in the Project-specific Soil Management Plan;
- Regularly inspect and maintain erosion and sediment control structures (for example, sediment fences, rip rap or other sediment control structures) during all Project phases and modify measures as necessary. If control measures are not functioning properly, no further work will occur until the problem is resolved;
- Limit duration of soil exposure; phase activities whenever possible, and restore disturbed areas as soon as possible (such as, implement appropriate erosion and sediment control, and progressive reclamation and revegetation of disturbed areas no longer required);
- Control potential erosion by utilizing an effective road design (including use of engineered culverts and bridges);
- Selectively cut vegetation and restrict clearing and grubbing within areas with steep slopes or soils prone to risk of erosion;

- Do not include mineral soil in the debris piles during clearing;
- Have construction activities occur under frozen or dry conditions as much as possible;
- Use clearing equipment appropriate to the nature of work being conducted that minimizes surface disturbance, soil compaction, and topsoil loss (for example, equipment with low ground pressure tracks or tires, blade shoes, and brushes), where feasible. For example, avoid using large machinery when hand tools or smaller scale machinery could be used;
- Regrade areas with vehicle ruts and erosion gullies to conform to the local landform to maintain drainage patterns;
- To the extent practicable, avoid work in sensitive areas (such as, erosive soils, wetland features, and fish habitats) during periods that may result in high flow volumes and / or increased erosion and sedimentation (such as, spring freshet) and help to confirm soil stockpiles are setback at least 100 metres from watercourses;
- Minimize stripping and grading of terrain between the height of land (drainage divide) and the watercourse, or within 100 metres of a watercourse crossing, whichever is less, and limit to that required to address engineering issues and safety concerns, such as the removal of hazards. If stripping or grading occurs within such areas, the site will be left at a stable angle;
- Use low road grades and proper drainage to reduce soil erosion, where feasible;
- Install and regularly maintain mitigation measures prior to the commencement of any site clearing, grubbing, excavation, filling, or grading works, prior to and after runoff events;
- Where soils are prone to wind erosion, apply tackifier, cover, and seed, apply water or pack the topsoil stockpiles and windrows with approved equipment, especially during periods of high erosion potential (such as, summer and fall);
- When practicable, consider pre-fabrication (such as, parts of structures) at an approved offsite location to minimize onsite construction effects;
- Minimize steepness and length of slopes of disturbed areas and stockpiled soils;
- Avoid placing soil stockpiles near waterbodies or drainage features (such as., a minimum distance of 100 metres from watercourses);
- All pits and quarries will be rehabilitated during their operational lifetime and once extraction is finished as per the Ontario Ministry of Natural Resources *Aggregate Resources Act*;

- Manage soil in accordance with the Best Management Practices for Aggregate Pit and Quarry Rehabilitation in Ontario (Madeh et al., 2021); and
- Manage any excess construction soil in accordance with the On-Site and Excess Soil Management Regulation under the Ontario *Environmental Protection Act*.

9.4.6.3.4.3 Residual Effects

Soils in the effects assessment Local Study Area are dominantly rated as having a low or moderate risk of wind erosion because of the finer soil textures noted, and dominantly have Very Low, Low, or Moderate susceptibility to water erosion because of the subdued landscape and lack of steep slopes. A higher proportion of soils with high wind erosion risk (approximately 11 percent more) were noted in the Construction Disturbance Area than in the effects assessment Local Study Area. This is due to the of the inclusion of sand and gravel resources which are associated with coarser textured soils prone to wind erosion. However, with environmental design features, mitigation, and monitoring, changes in soil distribution are anticipated to be minimized.

Reclamation and rehabilitation are predicted to reverse effects on temporarily disturbed soil map units and provide adequate material for the development of productive soils, which would support the establishment and succession of vegetation communities with similar function to natural ecosystems not influenced by the Project. Rehabilitation in reference to pits and quarries is defined as “the treatment of land from which aggregate has been excavated so that the use or condition of the land is restored to its former use or condition or is changed to another use or condition that is or will be compatible with the use of adjacent land” (Government of Ontario, 1990). The establishment of reclaimed soil in temporary components of the Project is predicted to occur well into operations, particularly for mature forest types. Irreversible residual effects from the Project will remain in 84.3 percent of the Construction Disturbance Area, and 3.4 percent of the effects assessment Local Study Area associated with the areas of permanent disturbance; this change will be brought forward into the Residual Effects Analysis.

The Project footprint would be limited to the extent practicable to minimize changes in quantity and distribution of soil units. Vegetation clearing and soil disturbance would also be limited to the minimum area required and work in areas containing soils sensitive to loss (such as, by erosion) would be scheduled during non-sensitive times of the year (such as, outside of spring freshet), to the extent practicable. Progressive reclamation and revegetation would be completed as facilities are removed and areas are no longer required for the Project to avoid prolonged soil exposure and potential soil loss. As this residual effect is of negligible magnitude and certain to occur, the effect was carried forward into the cumulative effects assessment.

9.4.6.3.5 Changes to Soil Quality from Compaction and Admixing

9.4.6.3.5.1 Potential Effects

For the effects assessment, existing soil quality has been described by categorizing soil based on its suitability for reclamation which takes chemical and physical characteristics of soil into consideration. These include pH, salinity, sodicity, base saturation, stoniness or coarse fragment content, texture, moisture content, and calcium carbonate equivalent. These characteristics typically change through the soil profile and require that during land clearing and site preparation, benefits of stripping the topsoil separately from the subsoil are considered. Site clearing, earth moving, excavation, pit and quarry development, and other construction activities can cause admixing and compaction which may change the quality of soil.

9.4.6.3.5.2 Mitigation and Enhancement Measures

Mitigation that will be implemented during construction to reduce changes to soil quality include:

- Limit the Project footprint (Construction Disturbance Area) to the extent practicable;
- Develop and implement a Project-specific Soil Management Plan (for example, soil stripping and handling recommendations, erosion and sediment control (based on the Ontario Ministry of Transportation's Erosion and Sediment Control Guide), reclamation procedures, best management practices and guidelines / policies);
- Use clearing equipment appropriate to the nature of work being conducted that minimizes surface disturbance, soil compaction, and topsoil loss (for example, equipment with low ground pressure tracks or tires, blade shoes, and brushes), where feasible. For example, avoid using large machinery when hand tools or smaller scale machinery could be used;
- Have construction activities occur under frozen or dry conditions as much as possible;
- Use low pressure or rubber tracked vehicles for the early phase of the construction season and only higher-pressure equipment when the ground surface is strong enough to prevent compaction and rutting;
- Avoid construction activities on highly saturated soil (primarily during or immediately after rain events or during freshet) where practicable or use suitable ground equipment to prevent unnecessary soil damage through rutting, for example. Crews should be prepared to stop work in these conditions;

- Regrade areas with vehicle ruts and erosion gullies to conform to the local landform to maintain drainage patterns; and
- De-compact subsoils, temporary access trails and soils damaged during wet weather.

9.4.6.3.5.3 Residual Effects

Soil compaction can occur during site clearing, contouring, and excavation if heavy equipment passes over soils that are sensitive to compaction. Generally, well-drained, coarse- and medium-textured soils (in other words, loams, sandy loam, loamy sand, loam) are less prone to compaction than fine-textured soils (in other words, silty clay loam, silty clay, clay loam, and clay). However, sensitivity to compaction can change based on soil moisture conditions (Lewis et al., 1989). Soils within the effects assessment Local Study Area generally have Low susceptibility to compaction; however, soils in level or low-lying areas that are under higher moisture conditions (for example, Gleysols) have a High susceptibility to compaction, and soils with moderately fine to very fine textures (for example, the L1, L4, M5 soil map units) are generally rated as having a Moderate susceptibility to compaction.

Reclamation and proper soil handling and management is predicted to reverse changes on temporarily disturbed soil map units and provide adequate material for the development of productive soils, which would support the establishment and succession of vegetation communities with similar function to natural ecosystems not influenced by the Project. The establishment of reclaimed soil in temporary components of the Project is predicted to occur well into operations, particularly for mature forest types.

Project activities could result in a measurable minor change to soil quality within the Construction Disturbance Area relative to existing conditions; however, the effect is expected to be localized and with the effective implementation of mitigation measures, no residual effects are predicted, and this effect was not carried forward to the Residual Effects Assessment.

9.4.6.4 Residual Effects – Operations Phase

9.4.6.4.1 Changes to Soil Quality from Contamination due to Potential Leaks or Spills of Deleterious or Hazardous Substances

9.4.6.4.1.1 Potential Effects

There is the potential for accidental spills of fuels and other materials resulting in the release of deleterious substances and soil contamination during operations. These can occur from malfunctions of equipment such as hydraulic and fluid leaks, spills during equipment or vehicle refuelling, or from vehicle accidents.

9.4.6.4.1.2 Mitigation and Enhancement Measures

Mitigation measures that will be implemented during operations to reduce changes to soil quality from contamination include:

- Develop and implement a Spill Prevention and Emergency Response Plan, in the event of a spill;
- Adhere to Standard Operating Procedures for fuel handling;
- Construction and operations machinery will arrive on site in a clean condition, free from leaks;
- Crews will always keep a spill response kit on site during the work;
- Contain and clean up spills immediately in accordance with provincial regulatory requirements and the Spill Prevention and Emergency Response Plan;
- Transport fuel and hazardous materials in approved containers in licensed vehicles; and
- Require crews using the Community Access Road to report spills to the Ontario Spills Action Centre at 1-800-268-6060.

Community members from Marten Falls First Nation proposed a number of mitigation measures related to pollution control that were outlined within the Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study (Marten Falls First Nation, 2023) including:

- Provide and make sure holding bats are readily available, so there is less chance of spillage;
- Provide adequate lighting at fuelling stations and monitoring so that people clean up after any spills;
- Provide various pit stops along the Community Access Road where drivers can check their tanks and valves; and
- Provide barriers along the sides of bridges to prevent other chemicals from spilling into waterways beneath them.

9.4.6.4.1.3 Residual Effects

The wash-off of fluids from accidental spills and leaks may result in an increase to the concentrations of chemical constituents to soils. However, leaks, or spills are considered avoidable with good planning, adequate design, and proper emergency response. Further to this, the frequency, spatial extent and severity of accidental spills or leaks during operations of the Project are anticipated to be minimized with the effective implementation of the mitigation and enhancement measures. However, it is recognized that, even with

the best planning and the implementation of mitigation measures, the potential exists for accidents and malfunctions. As such, measurable changes (such as, residual effects) to soil quality in the form of increase to the concentrations of chemical constituents could occur in the event of the wash-off from accidental spills or leaks. This effect is carried forward to the residual effects assessment.

Accidental spills and leaks from pit and quarry aggregate extraction and processing, the transportation, storage, and handling of hazardous materials during the construction, and the operation of vehicles and equipment during construction and operations, could occur, and, if occurring in high enough volumes, could change the chemical constituents and affect soil quality. The likelihood of occurrence of the effect was assessed as possible (the effect may occur, but is not likely), given that the implementation of the detailed Spill Prevention and Emergency Response Plan, which will be developed with consideration for applicable regulations and guidelines for spill management and clean-up, is expected to minimize opportunities for the wash-off of spills and leaks from relevant Project activities to enter nearby waterbodies.

As this residual effect is of negligible magnitude, infrequent and possible to occur, the effect was not carried forward into the cumulative effects assessment.

9.4.6.4.2 Changes to Soil Quality from the Transportation and Deposition of Air Contaminant Emissions (for example, Potential Acid Inputs) and Particulate Matter (Dust)

9.4.6.4.2.1 Potential Effects

Deposition of air contaminant emissions associated with Project activities are expected to occur from the combustion of fossil fuels and emission of criteria air contaminants. Criteria air contaminants include particulate matter less than 2.5 micrometres and 10 micrometres in diameter, total suspended particulates, carbon monoxide, sulphur dioxide, and nitrogen dioxides.

Construction activities such as land clearing, site preparation, site traffic, blasting of rock, burning of non-hazardous waste materials (for example, food waste), and handling of rock and aggregate materials from pit and quarry operations would generate criteria air contaminant and fugitive dust emissions, which can contain constituents such as metals. Accumulation of dust (in other words, total suspended particulate deposition) and associated constituents, such as metals, may result in changes to the chemical content of soil within affected areas. Changes to the chemical content of soil can alter soil pH and affect soil productivity. Operations activities, such as the operation of sand and gravel pits and quarries are also anticipated to result in emission of criteria air

contaminants and fugitive dust through the operation of equipment, combustion of fossil fuels and excavation and blasting activities.

Acid deposition may have an adverse effect on waterbodies, vegetation, and cause soil nutrient imbalances. Depending on the local airshed (in other words, heavy industry sources), the buffering capacity of the ecosystem or vulnerability to acid deposition may change. The Project location is considered a pristine environment, where heavy anthropogenic sources of emissions are not present (Dillon, 2026b). Air particulate emissions can change soil quality by altering soil pH, nutrient content, and the composition of soil organisms (Rusek and Marshall 2000; Jung et al., 2011; Chen et al., 2017). Air particulates may also affect cation and anion exchange in soil, decomposition rate of organic matter, and nutrient cycling (John et al., 2009; Jung et al., 2011). Deposition of sulphur dioxide and nitrogen dioxides could lead to acidification of soils (Holowaychuck and Fessenden, 1987; Bobbink et al., 1998).

9.4.6.4.2.2 Mitigation and Enhancement Measures

Mitigation measures that will be implemented during construction and operations to reduce changes to soil from emissions and deposition include those listed in the Atmospheric Environment Technical Support Document (**Appendix S**).

9.4.6.4.2.3 Residual Effects

Project design and mitigation policies and procedures are anticipated to limit fugitive dust emissions from the Project. Several mitigation measures would be applied to minimize dust deposition, such as watering the access roads and pits and quarries during dry conditions and establishing and enforcing speed limits on access roads to reduce dust production. With the effective implementation of mitigation measures, no residual effects are predicted for operations, and this effect was not carried forward to the Residual Effects Assessment.

9.4.6.5 Summary of Residual Effects

Table 9.4-17 provides a summary of the potential effects for physiography, terrain and soils, mitigation measures, and residual effects. Detailed information is included in **Appendix N**.

Table 9.4-17: Summary of Residual Effects for Physiography, Terrain and Soils

Valued Component	Project Activities	Project Phase	Description of Project Environmental Interaction	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Physiography, Terrain, and Soils**	• Blasting rock (for example, remove rock at quarries, and as required, at specific locations in association with road and bridge construction) • Constructing the Community Access Road (for example, overburden excavation and removal, excavation of granular material at pits, remove unsuitable soil, place and compact rock and granular material, trim and shape the road, stockpiling of mineral soil and leaf litter [organic material], and soil handling and replacement from stockpiles at decommissioning) • Constructing bridges and installing culverts (for example, surface water management and erosion control, dewatering of the watercourses to create ice bridges, alteration of natural drainage systems, watercourse bank grading to improve approaches if required) • Constructing, operating, and decommissioning temporary infrastructure (for example, remove temporary culverts and bridges, remediate channels)	• Construction	• Changes to terrain quantity / distribution from Project activities	• Limit the Project footprint (Construction Disturbance Area) to the extent practicable; • Minimize areas of vegetation clearing and soil disturbance and optimize the use of existing cleared areas for Project activity (in other words, site clearing will be kept to a minimum within the Community Access Road right-of-way); • Develop and implement a Project-specific Soil Management Plan (for example, soil stripping and handling recommendations, erosion and sediment control (based on the Ontario Ministry of Transportation's Erosion and Sediment Control Guide), reclamation procedures, best management practices and guidelines / policies); • Minimize stripping and grading of terrain between the height of land (drainage divide) and the watercourse, or within 100 metres of a watercourse crossing, whichever is less, and will be limited to that required to address engineering issues and safety concerns, such as the removal of hazards. If stripping or grading occurs within such areas, the site will be stabilized; • Regrade areas with erosional gullies to conform to the local landform to maintain drainage patterns during decommissioning of temporary infrastructure; • Strip the overburden from bedrock quarry areas before blasting or excavating and manage in accordance with the On-Site and Excess Soil Management Regulation, under the *Environmental Protection Act* (Government of Ontario, 1990e); and • All pits and quarries will be rehabilitated during their operational lifetime and once extraction is finished as per the *Aggregate Resources Act* (Government of Ontario, 1990b).	• Residual change to terrain quantity / distribution from Construction	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration: Long term for natural terrain units covered by permanent features (for example, Community Access Road); Medium-term for temporarily disturbed (reclaimed) terrain unit • Frequency: Infrequent • Reversibility: Irreversible: natural terrain map units covered by permanent features (for example, Community Access Road) • Likelihood: Certain • Uncertainty: Moderate • Direct / Indirect: Direct
• **Physiography, Terrain, and Soils**	• Constructing the Community Access Road (for example, overburden excavation and removal, excavation of granular material at pits, remove unsuitable soil, place and compact rock and granular material, trim and shape the road, stockpiling of mineral soil and leaf litter [organic material], and soil handling and replacement from stockpiles at decommissioning)	• Construction	• Changes to terrain quantity and distribution (esker landforms) from Project activities	• Minimize or avoid the use of eskers or similar geological features for aggregate resources by using bedrock quarries or other sand and gravel resources whenever possible; • Confirm suitable aggregate material in ridged landforms prior to extraction; and • All pits and quarries will be rehabilitated during their operational lifetime and once extraction is finished as per the *Aggregate Resources Act* (Government of Ontario, 1990b).	• Residual change to esker landforms from Construction	• Context: Ecological • Direction: Negative • Magnitude: Medium • Geographic Extent: Construction Disturbance Area • Duration: Long term • Frequency: Infrequent • Reversibility: Irreversible • Likelihood: Certain • Uncertainty: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Project Environmental Interaction	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Physiography, Terrain, and Soils**	• Constructing the Community Access Road (for example, overburden excavation and removal, excavation of granular material at pits, remove unsuitable soil, place and compact rock and granular material, trim and shape the road, stockpiling of mineral soil and leaf litter [organic material], and soil handling and replacement from stockpiles at decommissioning) • Constructing bridges and installing culverts (for example, surface water management and erosion control, dewatering of the watercourses to create ice bridges, alteration of natural drainage systems, watercourse bank grading to improve approaches if required) • Constructing, operating, and decommissioning temporary infrastructure (for example, remove temporary culverts and bridges, remediate channels)	• Construction	• Changes to terrain quantity and distribution (slope stability) from Project activities	• Avoid or minimize the amount of area for construction and subsequent operation facilities that are considered to have terrain that is either unstable or potentially unstable and design slopes for long-term stability. Stabilize slopes, if required; • Have construction activities occur under frozen or dry conditions as much as possible; • Avoid construction on highly saturated soil where practicable or use suitable ground equipment to avoid potentially increasing slope instability; • Regrade areas with erosional gullies to conform to the local landform to maintain drainage patterns; • Any exposed mineral soil between the height of land (drainage divide) and the watercourse, or within 100 metres of a watercourse crossing, whichever is less, will be kept to an absolute minimum and will be limited to that required to address engineering issues and safety concerns, such as the removal of hazards. If stripping or grading occurs within such areas, the site will be left at a stable angle; • Use low road grades and proper drainage to reduce potential terrain instability, where feasible; and • Implement progressive reclamation and revegetation of disturbed areas no longer required for construction.	• No residual effects anticipated	• No residual effect anticipated
• **Physiography, Terrain, and Soils**	• Clearing of the right-of-way (for example, remove and dispose of trees, shrubs, fallen timber, and surface litter, strip organic materials, grub) • Constructing the Community Access Road (for example, overburden excavation and removal, excavation of granular material at pits, remove unsuitable soil, place and compact rock and granular material, trim and shape the road, stockpiling of mineral soil and leaf litter [organic material], and soil handling and replacement from stockpiles at decommissioning) • Constructing bridges and installing culverts (for example, surface water management and erosion control, dewatering of the watercourses to create ice bridges, alteration of natural drainage systems, watercourse bank grading to improve approaches if required)	• Construction	• Changes to soil quantity and distribution from Project activities	• Limit the Project footprint (Construction Disturbance Area) to the extent practicable; • Minimize areas of vegetation clearing and soil disturbance and optimize the use of cleared area for Project activity (in other words, site clearing will be kept to a minimum within the all-season Community Access Road right-of-way); • Develop and implement a Project-specific Soil Management Plan (for example, soil stripping and handling recommendations, erosion and sediment control (based on the Ontario Ministry of Transportation's Erosion and Sediment Control Guide), reclamation procedures, best management practices and guidelines / policies); • Select erosion and sediment control products that correspond with the nature and duration of the Project as recommended in the Soil Management Plan; • Regularly inspect and maintain erosion and sediment control structures (for example, sediment fences, rip rap or other sediment control	• Residual change to soil quantity and distribution from Construction	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration: Long term for soil map units covered by permanent features (for example, Community Access Road); Medium-term for temporarily disturbed (reclaimed) soil map units. • Frequency: Infrequent • Reversibility: Irreversible for soil map units covered by permanent features (for example, Community Access Road); Reversible for reclaimed (temporary) soil map units.

Valued Component	Project Activities	Project Phase	Description of Project Environmental Interaction	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
	• Constructing, operating, and decommissioning temporary infrastructure (for example, remove temporary culverts and bridges, remediate channels)			structures) during all Project phases and modify measures as necessary. If control measures are not functioning properly, no further work will occur until the problem is resolved; • Limit duration of soil exposure; phase activities whenever possible, and restore disturbed areas as soon as possible (in other words, implement appropriate erosion and sediment control, and progressive reclamation and revegetation of disturbed areas no longer required); • Control potential erosion by utilizing an effective road design (including use of engineered culverts and bridges); • Selectively cut vegetation and restrict clearing and grubbing within areas with steep slopes or soils prone to risk of erosion; • Do not include mineral soil in the debris piles during clearing; • Have construction activities occur under frozen or dry conditions as much as possible; • Use clearing equipment appropriate to the nature of work being conducted that minimizes surface disturbance, soil compaction, and topsoil loss (for example, equipment with low ground pressure tracks or tires, blade shoes, and brushes), where feasible. For example, avoid using large machinery when hand tools or smaller scale machinery could be used; • Regrade areas with vehicle ruts and erosion gullies to conform to the local landform to maintain drainage patterns; • To the extent practicable, avoid work in sensitive areas (such as, erosive soils, wetland features, and fish habitats) during periods that may result in high flow volumes and / or increased erosion and sedimentation (for example, spring freshet); • Stripping and grading of terrain between the height of land (drainage divide) and the watercourse, or within 100 metres of a watercourse crossing, whichever is less, will be kept to an absolute minimum and will be limited to that required to address engineering issues and safety concerns, such as the removal of hazards. If stripping or grading occurs within such areas, the site will be left at a stable angle; • Use low road grades and proper drainage to reduce soil erosion, where feasible;		• Likelihood: Certain • Uncertainty: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Project Environmental Interaction	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				• Install and regularly maintain mitigation measures prior to the commencement of any site clearing, grubbing, excavation, filling, or grading works, prior to and after runoff events; • Where soils are prone to wind erosion, apply tackifier, cover, and seed, apply water or pack the topsoil stockpiles and windrows with approved equipment, especially during periods of high erosion potential (such as, summer and fall); • When practicable, consider pre-fabrication (for example, parts of structures) at an approved offsite location to minimize onsite construction effects; • Minimize steepness and length of slopes of disturbed areas and stockpiled soils; • Avoid placing soil stockpiles near waterbodies or drainage features; • All pits and quarries will be rehabilitated during their operational lifetime and once extraction is finished as per the *Aggregate Resources Act* (Government of Ontario, 1990b); • Manage soil in accordance with the Best Management Practices for Aggregate Pit and Quarry Rehabilitation in Ontario (Madeh et al., 2021); and • Manage any excess construction soil in accordance with the On-Site and Excess Soil Management Regulation under the *Environmental Protection Act* (Government of Ontario, 1990e).		
• **Physiography, Terrain, and Soils**	• Constructing the Community Access Road (for example, overburden excavation and removal, excavation of granular material at pits, remove unsuitable soil, place and compact rock and granular material, trim and shape the road, stockpiling of mineral soil and leaf litter [organic material], and soil handling and replacement from stockpiles at decommissioning) • Constructing bridges and installing culverts (for example, surface water management and erosion control, dewatering of the watercourses to create ice bridges, alteration of natural drainage systems, watercourse bank grading to improve approaches if required) • Constructing, operating, and decommissioning temporary infrastructure (for example, remove temporary culverts and bridges, remediate channels)	• Construction	• Changes to soil quality (compaction and admixing) from Project activities	• Limit the Project footprint (Construction Disturbance Area) to the extent practicable; • Develop and implement a Project-specific Soil Management Plan (for example, soil stripping and handling recommendations, erosion and sediment control (based on the Ontario Ministry of Transportation's Erosion and Sediment Control Guide), reclamation procedures, best management practices and guidelines / policies); • Use clearing equipment appropriate to the nature of work being conducted that minimizes surface disturbance, soil compaction, and topsoil loss (for example, equipment with low ground pressure tracks or tires, blade shoes, and brushes), where feasible. For example, avoid using large machinery when hand tools or smaller scale machinery could be used; • Have construction activities occur under frozen or dry conditions as much as possible;	• No residual effect anticipated	• No residual effect anticipated

Valued Component	Project Activities	Project Phase	Description of Project Environmental Interaction	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				• Use low pressure or rubber tracked vehicles for the early phase of the Community Access Road construction season and only higher-pressure equipment when the ground surface is strong enough to prevent compaction and rutting; • Avoid construction activities on highly saturated soil (primarily during or immediately after rain events or during freshet) where practicable or suitable ground equipment will be utilized to prevent unnecessary soil damage through rutting, for example. Crews should be prepared to stop work in these conditions; • Regrade areas with vehicle ruts and erosion gullies to conform to the local landform to maintain drainage patterns; and • De-compact subsoils, temporary access trails and soils damaged during wet weather.		
• **Physiography, Terrain, and Soils**	• Mobilization of equipment, supplies, and personnel (for example, haulage of materials, solid and liquid waste management, fuel storage, and hazardous materials handling, sewage and effluent treatment and water storage and effluent monitoring for temporary construction camps)	• Construction	• Changes to soil quality from contamination due to potential leaks or spills of deleterious or hazardous substances from Project activities	• Develop and implement a Spill Prevention and Emergency Response Plan, in the event of a spill; • Adhere to Standard Operating Procedures for fuel handling; • Construction machinery will arrive on site in a clean condition, free from leaks; • Construction crews will always keep a spill response kit on site during the work; • Contain and clean up spills immediately in accordance with provincial regulatory requirements and the Spill Prevention and Emergency Response Plan; • Transport fuel and hazardous materials in approved containers in licensed vehicles; and • Require construction crews and drivers of vehicles using the Community Access Road system to report spills to the Ontario Spills Action Centre at 1-800-268-6060; • Provide and make sure holding bats are readily available, so there is less chance of spillage; • Provide adequate lighting at fuelling stations and monitoring so that people clean up after any spills; • Provide various pit stops along the Community Access Road where drivers can check their tanks and valves; and • Provide barriers along the sides of bridges to prevent other chemicals from spilling into waterways beneath them.	• Residual change to soil quality from contamination due to potential leaks or spills or deleterious or hazardous substances during Project activities	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration: Short term • Frequency: Infrequent • Reversibility: Reversible • Likelihood: Possible • Uncertainty: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Project Environmental Interaction	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Physiography, Terrain, and Soils**	• Operate the Preferred Route • Maintain the Preferred Route(Footnote a)	• Operations	• Changes to soil quality from contamination due to potential leaks or spills of deleterious or hazardous substances from Project activities	• Implement a Spill Prevention and Emergency Response Plan, in the event of a spill; • Adhere to Standard Operating Procedures for fuel handling; • Operations machinery will arrive on site in a clean condition, free from leaks; • Maintenance crews will always keep a spill response kit on site during the work; • Contain and clean up spills immediately in accordance with provincial regulatory requirements and the Spill Prevention and Emergency Response Plan; • Transport fuel and hazardous materials in approved containers in licensed vehicles; • Require maintenance crews and drivers of vehicles using the Community Access Road system to report spills to the Ontario Spills Action Centre at 1-800-268-6060; • Provide and make sure holding bats are readily available, so there is less chance of spillage; • Provide adequate lighting at fuelling stations and monitoring so that people clean up after any spills; • Provide various pit stops along the Community Access Road where drivers can check their tanks and valves; and • Provide barriers along the sides of bridges to prevent other chemicals from spilling into waterways beneath them.	• Residual change to soil quality from contamination due to potential leaks or spills or deleterious or hazardous substances during Project activities	• Context: Ecological • Direction: Negative • Magnitude: Negligible • Geographic Extent: Construction Disturbance Area • Duration: Short term • Frequency: Infrequent • Reversibility: Reversible • Likelihood: Possible • Uncertainty: Moderate • Direct / Indirect: Direct
• **Physiography, Terrain, and Soils**	• Constructing the Community Access Road (for example, overburden excavation and removal, excavation of granular material at pits, remove unsuitable soil, place and compact rock and granular material, trim and shape the road, stockpiling of mineral soil and leaf litter [organic material], and soil handling and replacement from stockpiles at decommissioning) • Blasting rock (for example, remove rock at quarries, and as required, at specific locations in association with road and bridge construction) • Mobilization of equipment, supplies, and personnel (for example, haulage of materials, solid and liquid waste management, fuel storage, and hazardous materials handling, sewage and effluent	• Construction	• Changes to soil quality from the transport and deposition of air contaminant emissions (for example, potential acid inputs) and particulate matter (dust) from Project activities	• Minimize areas of vegetation clearing and soil disturbance and optimize the use of cleared areas for Project activities (in other words, site clearing and maintenance activities will be kept to a minimum within the Community Access Road right-of-way) while maintaining safe traffic and pedestrian flows, and follow best practices for design speeds and expected vehicle traffic; • Limit vehicle speed to reduce fugitive dust during operations activities; • Optimize access roads to reduced fuel consumption and emissions from equipment; • Apply water and / or suppressants to gravel roads, as necessary. Use dust suppressants that minimize environmental risk and are government approved for use; • Limit idling of vehicles and equipment to the extent practicable;	• No residual effect anticipated	• No residual effect anticipated

Valued Component	Project Activities	Project Phase	Description of Project Environmental Interaction	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
	treatment and water storage and effluent monitoring for temporary construction camps)			• Use and maintain emissions control devices on combustion based equipment; and • Conduct regular maintenance on mobile construction equipment and vehicles, and operate the equipment within parameters for engine exhaust system design.		
• **Physiography, Terrain, and Soils**	• Blasting rock (for example, remove rock at quarries) • Mobilization of equipment, supplies, and personnel (for example, haulage of materials, solid and liquid waste management, fuel storage)	• Operations	• Changes to soil quality from the transport and deposition of air contaminant emissions (for example, potential acid inputs) and particulate matter (dust) from Project activities	• Minimize areas of vegetation clearing and soil disturbance and optimize the use of cleared areas for Project activities (in other words, site clearing and maintenance activities will be kept to a minimum within the Community Access Road right-of-way) while maintaining safe traffic and pedestrian flows, and follow best practices for design speeds and expected vehicle traffic; • Limit vehicle speed to reduce fugitive dust during operations activities; • Optimize access roads to reduced fuel consumption and emissions from equipment; • Apply water and / or suppressants to gravel roads, as necessary. Use dust suppressants that minimize environmental risk and are government approved for use; • Limit idling of vehicles and equipment to the extent practicable; • Use and maintain emissions control devices on combustion based equipment; and • Conduct regular maintenance on mobile construction equipment and vehicles, and operate the equipment within parameters for engine exhaust system design.	• No residual effect anticipated	• No residual effect anticipated

Footnotes: (a) Includes general maintenance activities (for example, grading, erosion control, excavation at pits / quarries and processing aggregate, dust suppression), seasonal maintenance activities (for example, clear vegetation on road shoulders, snow clearing and bridge and culvert maintenance, ditch maintenance), and special maintenance activities (for example, slope failures and road settlement / break-up).

- Various mitigation and enhancement measures have been included from the Community Access Road Preferred Route Selection and Preliminary Environmental Work Project Proposal (Marten Falls First Nation, 2017b).

9.4.7 Assessment of Significance of Land Disciplines

The assessment of significance of residual effects of the Community Access Road is informed by the interaction between the significance factors, with magnitude and geographic extent being the most important factors. Consideration is also given to context, which includes ecological context (in other words, the sensitivity and resilience of the valued components), and social context (in other words, concerns of Indigenous communities, interested agencies, groups and individuals raised during consultation and engagement and through review comments on the Environmental Assessment reports). Implementation of proven mitigation measures is expected to aid in the avoidance or reduction of the magnitude, geographic extent, and / or duration of residual effects on vegetation, wildlife, birds, ungulates and physiography, terrain and soils.

9.4.7.1 Determination of Significance

Using the overall residual effects characteristics for each discipline, each of the potential residual effects was assigned a significance level as a means of ranking the potential effects on the surface water quantity, surface water quality, and sediment quality. The significance levels are defined as:

- Significant**:** residual effects were considered to be significant if the majority of the residual effects characteristics were assessed as high in magnitude and long-term or permanent in duration, at any geographic extent, or they represented a management concern; and
- Not Significant: residual effects were considered not significant if they demonstrated any other combination.

9.4.7.2 Vegetation

The magnitude of the predicted residual effects on vegetation valued components is either negligible or low in magnitude and range from confined to the Construction Disturbance Area to local in geographic extent.

Residual effects on vegetation valued components were considered not significant as the residual effects were assessed negligible, low or medium in magnitude, and they do not represent a substantial concern for the long-term viability of vegetation valued components. There is the potential for management concerns through an increased public access leading to the spread of invasive species, increased risk of human-ignited wildlife and increased pressure on timber and Traditional Use Plant harvest, however these risks are minor and manageable.

Based on the weight of evidence from the analysis, uncertainty in effects predictions, specifically those associated with the “floating road” approach to construction and operation, and application of the precautionary approach, Project-related changes in the availability, distribution, composition, and function of Wetland Ecosystems could occur. Specifically, those changes to Wetland Ecosystems associated with groundwater quantity and quality were assessed as significant. As a result, the combined residual effects from the Project on Wetland Ecosystems are predicted to be significant.

Overall, the remaining vegetation valued components are expected to remain to be self-sustaining and ecologically effective, and therefore, the predicted residual effects on all vegetation valued components are assessed as not significant.

Overall, there is a moderate to high degree of confidence in the predictions related to the changes to vegetation valued components. Mitigation measures and best management practices would be implemented to reduce effects on the vegetation valued components and there is a high level of confidence in the mitigation measures and best management practices as these are routinely and effectively implemented across Canada.

Overall, confidence levels were considered to be moderate because there were existing conditions data for the effects assessment Local Study Area, the project-related effects are mostly understood, and the level of certainty associated with the effectiveness of proposed mitigations is low to high.

9.4.7.3 Wildlife

9.4.7.3.1 Bats (Little Brown Myotis and Northern Myotis)

The magnitude of the predicted residual effects on little brown myotis and northern myotis are of negligible to low magnitude and vary from being confined to the effects assessment Construction Disturbance Area to the wildlife effects assessment Local Study Area in geographic extent.

Residual effects on the bat valued component were considered not significant as the residual effects were assessed negligible to low in magnitude and they do not represent a substantial risk to bat populations in the effect assessment Regional Study Area.

Overall, the regional little brown myotis and northern myotis populations are expected to remain self-sustaining and ecologically effective in the residual effects assessment (in other words, there is no predicted change in the assessment endpoints). The anticipated changes to bat habitat availability, distribution, and survival and reproduction from the Community Access Road are expected to remain within the resilience and

adaptability limits of the regional populations. The residual effects from the Community Access Road on little brown myotis and northern myotis are therefore considered not significant.

9.4.7.3.2 Furbearers (Wolverine)

The magnitude of the predicted residual effects on wolverine is of negligible to moderate magnitude, short-term to permanent (irreversible) and vary from being confined to the effects assessment Construction Disturbance Area to the wolverine effects assessment Local Study Area in geographic extent. There is uncertainty about how wolverines will respond to the Community Access Road once constructed. It has the potential impact their distribution or connectivity at a regional level.

The Community Access Road occurs near the transition from boreal shield ecozone to the Hudson Bay Lowlands. Ray et. al. (2018), demonstrated that wolverine probability of occupancy declines in the Hudson Bay Lowlands compared to the boreal shield ecozone. While the limitations to wolverine occupancy in the Hudson Bay Lowland ecozone is not fully understood, it is speculated that it could be due to a lack of suitable resources (for example prey species) (Ray et. al. 2018). A large portion of the Regional Study Area lies within the Hudson Bay Lowland ecozone. The female wolverines displaced from boreal habitat by the Community Access Road may not be successful in establishing territories to the north and east of the Community Access Road. Therefore, there is a risk of reduced reproductive success in the females that inhabit home ranges that overlap with the Community Access Road which may represent a risk to the low-density wolverine population in the effect assessment Regional Study Area.

There is high uncertainty regarding the number of wolverine mortalities that may be caused by collisions with vehicles from the Community Access Road. Given that there are no existing permanent roads present in the effect assessment Regional Study Area, the wolverine that inhabit this area will be naive to the risk of road mortality. Wolverine are considered a threatened population in Ontario, whose populations are declining, and as such they will be sensitive to changes in survival and reproduction from an additional mortality source. Compounded by wolverines' low reproductive rate, and the low population density in the Regional Study Area, the mortality of a small number of reproductive females would have a negative effect on the regional population.

The residual effect from habitat loss and alteration and collisions with vehicles were predicted to have a moderate magnitude of effect on wolverines. Due to the high level of uncertainty (in other words, low prediction confidence) about how wolverines will respond to the Community Access Road once constructed and in the ability to avoid or mitigate the magnitude of these effects on the regional wolverine population, a

precautionary approach was applied, and it is anticipated that the Project effects may be significant to the sustainability of the population in the effect assessment Regional Study Area**.**

Overall, if the reproductive success of a few female wolverines in this low-density, low-reproductive-rate population is affected, the regional wolverine population may not remain self-sustaining and ecologically effective in the residual effects assessment (in other words, there is a predicted change in the assessment endpoints). The anticipated changes to wolverine habitat availability, distribution, and survival and reproduction from the Community Access Road may not remain within the resilience and adaptability limits of the regional population.

9.4.7.3.3 Furbearers (American Marten)

Predicted residual effects on American martens are of negligible to low magnitude and are short-term to permanent (irreversible) in duration and vary from being confined to the effects assessment Construction Disturbance Area to the wildlife effects assessment Local Study Area in geographic extent.

Residual effects on American marten were considered not significant as the residual effects were assessed to be negligible to low in magnitude and do not represent a substantial risk to marten populations in the effect assessment Regional Study Area.

Overall, American marten populations are expected to remain ecologically functional and self-sustaining in the residual effects assessment and there is no predicted change in the assessment endpoints. The anticipated changes to American marten habitat availability, distribution, and survival and reproduction from the Community Access Road are expected to remain within the resilience and adaptability limits of the regional populations.

9.4.7.3.4 Furbearers (Beaver)

Predicted residual effects on beavers are of negligible to low magnitude and are short-term to permanent (irreversible) in duration and vary from being confined to the effects assessment Construction Disturbance Area to the wildlife effects assessment Local Study Area in geographic extent.

Residual effects on beaver were considered not significant as the residual effects were assessed to be negligible to low in magnitude and do not represent a substantial risk to marten populations in the effect assessment Regional Study Area.

Overall, beaver populations are expected to remain ecologically functional and self-sustaining in the residual effects assessment and there is no predicted change in the assessment endpoints. The anticipated changes to beaver habitat availability, distribution, and survival and reproduction from the Community Access Road are expected to remain within the resilience and adaptability limits of the regional populations.

9.4.7.3.5 Reptiles and Amphibians

The magnitude of the predicted residual effects on reptiles and amphibian is of negligible to low magnitude, short-term to permanent (irreversible) and vary from being confined to the effects assessment Construction Disturbance Area to the wildlife effects assessment Local Study Area in geographic extent.

Residual effects on the reptiles and amphibians valued component were considered not significant as the residual effects were assessed negligible to low in magnitude and they do not represent a substantial risk to reptile and amphibian populations in the wildlife effect assessment Regional Study Area.

Overall, the regional reptile and amphibian populations are expected to remain self-sustaining and ecologically effective in the residual effects assessment (in other words, there is no predicted change in the assessment endpoints). The anticipated changes to reptile and amphibian habitat availability, distribution, and survival and reproduction from the Community Access Road are expected to remain within the resilience and adaptability limits of the regional populations. The residual effects from the Community Access Road on reptiles and amphibians are therefore considered not significant assuming the mitigation measures, including sub-surface eco-passages at strategic locations such as culverts are implemented.

9.4.7.3.6 Pollinating Insects

The magnitude of the predicted residual effects on pollinating insects is of negligible magnitude, short-term to permanent (irreversible) and vary from being confined to the effects assessment Construction Disturbance Area to the wildlife effects assessment Local Study Area in geographic extent.

Residual effects on the pollinating insect valued component were considered not significant, as the residual effects were assessed negligible in magnitude, and they do not represent a substantial risk to insect populations in the effect assessment Regional Study Area.

Overall, the regional pollinating insect populations are expected to remain self-sustaining and ecologically effective in the residual effects assessment (in other words, there is no predicted change in the assessment endpoints). The anticipated changes to pollinating insect habitat availability, distribution, and survival and reproduction from the Community Access Road are expected to remain within the resilience and adaptability limits of the regional population. The residual effects from the Community Access Road on pollinating insects are therefore considered not significant.

9.4.7.4 Birds

9.4.7.4.1 All Bird Valued Components

Predicted residual effects on all bird valued components are negative but negligible in magnitude, unlikely to possible to occur (except effects from changes to groundwater quantity and dust emissions on bird habitat availability and distribution, which are probable or certain), and ranging from confined to the effects assessment Construction Disturbance Area (for example incidental take) to confined to the Effects Regional Study Area (for example increased public access).

Bird valued components are predicted to remain self-sustaining and ecologically effective with the implementation of the Community Access Road. Overall, the anticipated changes to bird valued component habitat availability, distribution, and survival and reproduction from the Community Access Road are expected to remain within the resilience and adaptability limits of the regional populations. Effects from soil contamination from introduction and spread of invasive plants, emissions of criteria air contaminants, changes to erosion and sedimentation, changes to groundwater quantity, dust deposition, increased public access, incidental take, collisions with vehicles and equipment, and wildlife attractants on bird valued components are therefore predicted to be not significant.

9.4.7.4.2 Individual Birds

Information on individual bird species assessed can be found in Birds Technical Support Document (**Appendix L**). The following bird species were assessed:

- Forest Birds: Red-eyed Vireo, Oven bird, Dark-eyed Junco
- Raptors: Osprey, Boreal Owl
- Shorebirds: Wilson’s Snipe
- Waterfowl and Waterbirds: Mallard
- Bog / Fen Birds and Other Wetland Birds: Palm Warbler, Common Yellowthroat, Northern Waterthrush, Sora

- Species at Risk Birds: Canada Warbler, Evening Grosbeak, Chimney Swift, Bank Swallow, Barn Swallow, Common Nighthawk, Eastern Whip-poor-will, Eastern Wood-pewee, Olive-sided Flycatcher, Bald Eagle, Peregrine Falcon, Short-eared Owl, Black Tern, Lesser Yellowlegs, Rusty Blackbird, Yellow Rail

Predicted residual effects from habitat loss and sensory disturbance on bird habitat availability, distribution, and survival and reproduction are of low magnitude and are confined to the effects assessment Construction Disturbance Area or the effects assessment Local Study Area. Effects are certain or probable and are mostly irreversible (long-term).

Birds is predicted to remain self-sustaining and ecologically effective with the implementation of the Community Access Road. Overall, the anticipated changes to bird habitat availability, distribution, and survival and reproduction from the Community Access Road are expected to remain within the resilience and adaptability limits of the regional population. The residual effects from the Community Access Road for each individual bird species are therefore considered not significant.

9.4.7.5 Ungulates

9.4.7.5.1 Boreal Caribou

The predicted residual effects associated with each Community Access Road - environment interaction on Boreal caribou habitat availability, distribution and survival and reproduction vary from negligible to high magnitude, long-term in duration and a geographic scope that extends from the effects assessment Construction Disturbance Area to beyond the caribou effects assessment Regional Study Area. Residual effects on caribou due to sensory disturbance, increased predator access, increase in public access, collisions with vehicles and equipment, changes in groundwater, and fugitive dust emissions were determined to be not significant (**Table 9.4-14**). In contrast, residual effects on caribou from habitat loss and alteration and linear barriers were determined to be significant and varied among caribou ecotypes and ranges**.**

Caribou have large home ranges with specific habitat needs in different seasons and have demonstrated negative population-level responses to anthropogenic disturbances throughout their Canadian distribution. The Nipigon range is currently below the established threshold of 65 percent undisturbed habitat that is considered necessary to support a self-sustaining population, while the Missisa, Ozhiski and Pagwachuan ranges are above the threshold and predicted to be likely self-sustaining based on availability of critical habitat. Despite the availability of undisturbed habitat, there is uncertainty about the population trends in the Missisa, Ozhiski and Pagwachuan

ranges, which vary from declining to stable in federal and provincial assessments. Research conducted in northern Saskatchewan, where there is a similar natural disturbance regime and low net primary productivity as in the Missisa and Ozhiski ranges, found that caribou were resilient to fire disturbance (McLoughlin et al., 2019) and natural disturbance was not strongly linked to population growth of caribou (Neufeld et al., 2021). In the Missisa and Ozhiski ranges, the connection between a large amount of undisturbed habitat and a declining population trend leads to uncertainty in the resiliency of the populations in the exiting environment. Due to this uncertainty and following the precautionary approach, the confidence in the predicted potential effects ranged from low to high.

With the addition of the Community Access Road, the availability of habitat for caribou is expected to remain less than the threshold of 65 percent undisturbed habitat to maintain a self-sustaining population in the Nipigon range. The small incremental increase in habitat disturbance from the Community Access Road (3,951 hectares, which represents a 0.3 percent increase in anthropogenic disturbance in the range relative to existing conditions) will contribute to the existing significant effect of habitat loss and alteration in the Nipigon range. However, the loss of habitat is predicted to have little to no influence on survival and reproduction at the population level. The availability of habitat for caribou in the Missisa, Ozhiski and Pagwachuan ranges will remain above the threshold of 65 percent undisturbed, and the effect of habitat loss associated with the addition of the Community Access Road is predicted to be not significant on caribou in those ranges or the caribou effects assessment Regional Study Area.

A conservative approach was applied to the determination of significance for linear barrier effects on caribou mostly because this assessment was primarily informed by 2 years of recent collar data for caribou that interact with the ungulate effects assessment Local Study Area. Two years of data is not long relative to the longevity of caribou and acquiring confident knowledge of movement patterns. Previous collar data and federal and provincial assessments were also used to inform potential effects but were over 10 years old. Caribou collared for this Community Access Road and in previous research in northern Ontario have demonstrated behavioural plasticity in ecotypes and their movements between habitats. Other studies have detected variation in the responses of caribou to linear developments from strong avoidance to degrees of habituation and adaptive capacity to travel across roads. These variations in migratory movements and behavioural responses to linear features influence the confidence in predicting effects from the Community Access Road on the seasonal movement of eastern migratory caribou and connectivity between populations (or ranges) within and beyond the caribou effects assessment Regional Study Area (Nipigon, Missisa, Ozhiski, Pagwachuan ranges).

Given the minimal amount of anthropogenic disturbance in the ungulate effects assessment Local Study Area and in the Missisa and Ozshiki ranges, it is anticipated that naive caribou may exhibit strong avoidance behaviours during construction and operations of the Community Access Road. This may be particularly the case for more sedentary caribou with home ranges that overlap the Community Access Road. Over time, caribou may adapt and perceive the Community Access Road as a semi-permeable barrier to seasonal movements between important habitats or ranges. Alternatively, the Community Access Road may disrupt seasonal movements across ranges and connectivity between populations, which may have demographic consequences and lead to permanent changes in survival and reproduction. Due to these uncertainties and following the precautionary approach, the magnitude of the residual effect from linear barriers was assessed as high and determined to be significant.

Based on the weight of evidence, uncertainty in effects predictions and application of the precautionary approach, project-related changes in habitat availability and distribution and survival and reproduction could approach or extend beyond the resilience capabilities of one or more caribou population(s) overlapping the caribou effects assessment Regional Study Area. As a result, the combined residual effects from the Community Access Road on caribou and caribou habitat are determined to have a significant influence on self-sustaining and ecologically effective caribou populations.

9.4.7.5.2 Moose

The predicted residual effects associated with each Project-environment interaction on moose and moose habitat vary from negligible to high magnitude, short-term (reversible) to long-term (irreversible) duration, and from the effects assessment Construction Disturbance Area to the moose effects assessment Regional Study Area. Given the uncertainty in the potential increases in non-Indigenous and Indigenous moose harvest and the limited data on current Indigenous harvest levels, it was precautionarily assumed that the effects of increases in public access during Operations of the Project could reach unsustainable levels and lead to decreased resilience and maintenance of the self-sustaining and ecologically effective regional moose population. As such, residual effects on moose from increase in public access during Operations are precautionarily considered significant.

All other Project interactions are not predicted to significantly affect the ability of the regional moose population to remain self-sustaining and ecologically effective (in other words, there is no predicted change in the assessment endpoints). As such, all other Project interactions are considered not significant.

The anticipated changes to moose habitat availability and distribution from the Project are expected to remain within the resilience and adaptability limits of the regional population. However, it was precautionarily assumed that the Project could result in a significant change to moose population survival and reproduction due to potentially unsustainable harvest levels from increases in public access during operations. As such, the combined residual effects from the Project on moose and moose habitat are determined to have a significant influence on self-sustaining and ecologically effective moose populations.

9.4.7.6 Physiography, Terrain, and Soils

A determination of significance of residual effects on the physiography, terrain, and soils valued component cannot be completed as this valued component does not have an assessment endpoint. Assessment endpoints are qualitative expressions that represent the key properties of the environment that should be protected. Physiography, terrain, and soils are critical to the effects assessment and determination of significance for other biophysical valued component; however, the importance or significance of changes in physiography, terrain, and soils can only be evaluated in context of valued components with assessment endpoints, as these valued components are the ultimate receptors of value to humans and the environment.

9.5 People

"Anishinaabe bimaadiziwin (an Anishinaabe way of living) and mino-bimaadiziwin (living a good life) are ways-of-being given to Anishinaabe people as part of their original instructions, which are reflected in the Creation story. It tells us how we were created from the earth and lowered to the earth; how the Creator had such incredible love for us, and therefore gave us gifts from Creation (such as wind / air, fire, and water) to house within our bodies. This incredible love is re-enacted in our children, as they are not to take life for granted; they are to appreciate life and be affirmed through cultural traditions and practices that they are the life of the people. When the first being was created, s/he looked back through each of the four levels of Creation to always remember where s/he came from – the incredible love of the Creator. The one first lowered to earth had such incredible respect for the earth when s/he touched down upon all her beauty that s/he did not even want to bend one blade of grass. S/he teaches the Anishinaabe people to have the utmost respect for the earth, as they depend on her for their survival. Respect is, therefore, spirit given. It is important for Anishinaabe children to know that they come from the Creator. The Creation story illustrates this for them and provides them with all of the values they need in order to fulfill the Creator's instructions of living in a good way (mino-bimaadiziwin) and celebrating life. When life is disrespected, there is a belief that that disrespect will come back to you and something will happen to you – termed as oohjine in the Anishinaabe language. There is good and bad in everything – water gives life, yet you can drown in it. Everything must be respected for this reason." (Bell, 2016).

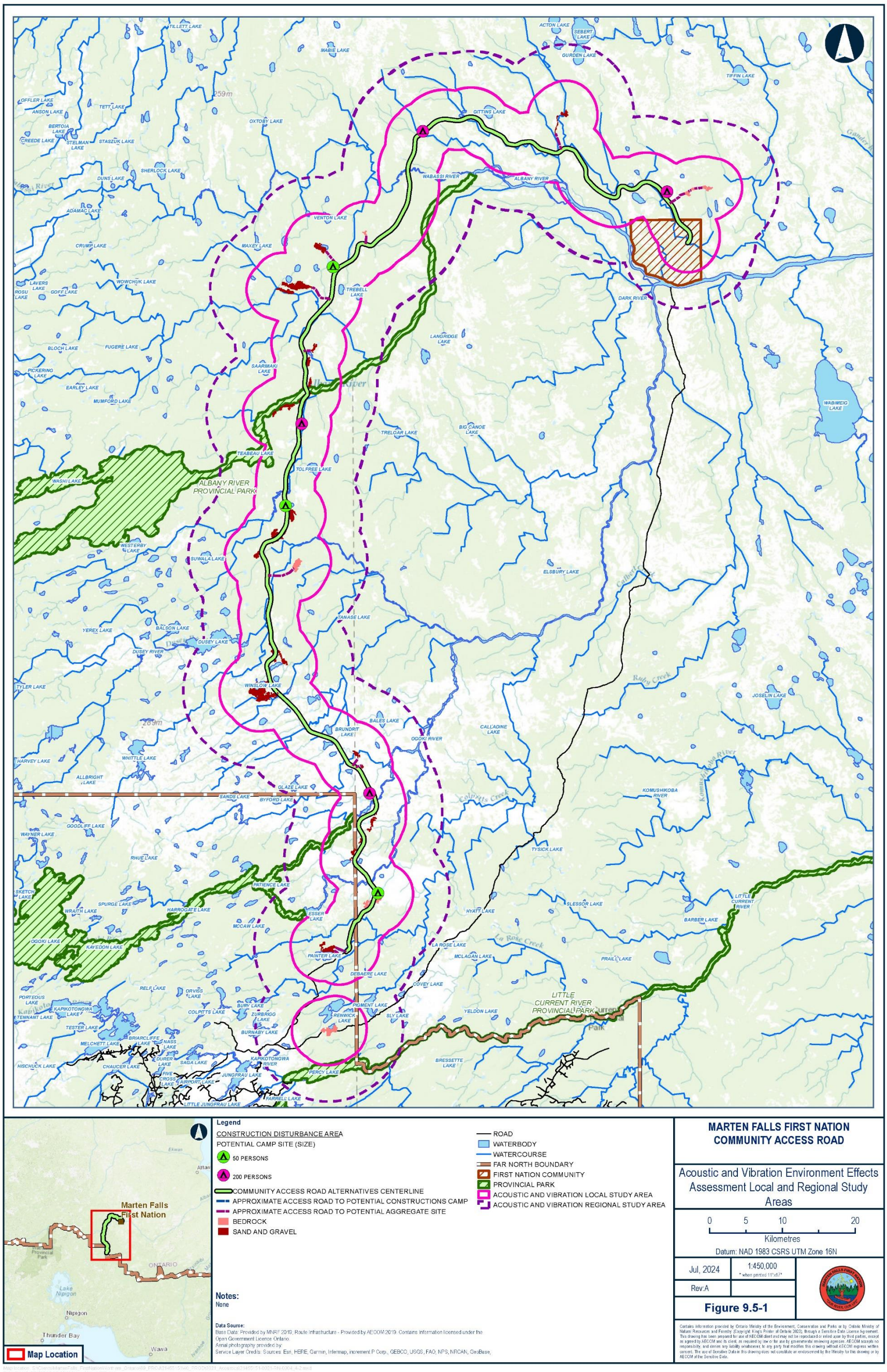
9.5.1 Spatial Boundaries of People Disciplines

As part of the effects assessment exercise, some disciplines revised their study areas based on the development of the Preferred Route. The updated study areas for Aboriginal and / or Treaty Rights and Interest, acoustic environment, atmospheric environment, archaeological and cultural heritage, community well-being, land and resource use and visual environment are defined in **Table 9.5-1** and shown on **Figure 9.5-1**.

Table 9.5-1: People Study Areas

Discipline(s)	Construction Disturbance Area	Local Study Area	Regional Study Area
• Aboriginal and Treaty Rights and Interests	• No change from **Section 8**	• No change from **Section 8**	• No change from **Section 8**
• Acoustic and Vibration	• No change from **Section 8**	• No change from **Section 8**	• No change from **Section 8**
• Atmospheric (Air Quality)	• Construction Disturbance Area plus a 5-kilometre buffer that extends from the perimeter of the Construction Disturbance Area	• A Local Study Area has been selected to align with the Ontario Ministry of the Environment, Conservation and Parks recommendations for local dispersion modelling, which is that effects be assessed up to 5 kilometres from a source (Ministry of the Environment, Conservation and Parks, 2018). • Area Size: 239,095 hectares	• Not applicable as effects are not expected beyond the Local Study Area.
• Atmospheric (Green House Gas)	• No change from **Section 8**	• No change from **Section 8**	• No change from **Section 8**
• Archaeology and Cultural Heritage (Archaeology)	• No change from **Section 8**	• No change from **Section 8**	• No Change from **Section 8**
• Archaeology and Cultural Heritage (Cultural Heritage)	• No change from **Section 8**	• No change from **Section 8**	• No change from **Section 8**
• Community Well-Being	• No change from **Section 8**	• No change from **Section 8**	• No change from **Section 8**
• Land and Resource Use	• No change from **Section 8**	• No change from **Section 8**	• No change from **Section 8**
• Visual Environment	• No change from **Section 8**	• No change from **Section 8**	• Refer to technical support document (**Appendix V**)

Figure 9.5-1 Acoustic and Vibration Environment Effects Assessment Local and Regional Study Areas



9.5.2 Aboriginal and / or Treaty Rights and Interests

As described in **Section 8.3.4**, an assessment was done for the each of the 23 Indigenous communities listed in **Section 11.2.** Communities received detailed reports describing existing conditions and potential interactions with Aboriginal and / or Treaty Rights and Interests, and were given the opportunity to review and provide feedback on draft versions. To support regulatory review, these reports will be submitted to the Regulator as part of the evidence base for determining assessment outcomes. Due to confidentiality and the sensitive nature of the information, **the detailed reports will not be shared publicly.** As a result, the following sections provide a high-level summary of the methodology used in these assessments.

Each confidential, community-specific Aboriginal and / or Treaty Rights and Interests Impact Assessment Report provides results for the Preferred Route, considering the Project's temporal boundaries. These reports outline potential positive and negative impacts, proposed mitigation and enhancement measures, and an assessment of residual impacts. Where relevant, Gender-Based Analysis Plus was applied to each Valued Component to address differential effects across community segments.

9.5.2.1 Project-Environment Interactions

The assessment examined potential interactions between the Project and each Indigenous community's Aboriginal and / or Treaty Rights and Interests. This was done by comparing Areas of Interest with defined Study Areas, incorporating input from Indigenous communities through consultation and Indigenous Knowledge programs, reviewing available information on existing conditions, and evaluating possible impacts from Project construction, operation, and maintenance. It is the Proponent's understanding that Areas of Interest are where each Indigenous community may exercise / hold Aboriginal and / or Treaty Rights and Interests and practice culture.

Each confidential, community-specific report considered two valued components: **Indigenous Current Use of Lands and Resources for Traditional Purposes** and **Cultural Continuity and Well-being**, including analysis of spatial overlaps and potential impacts on rights. This process was carried out for every Indigenous community and shared directly to them in their community-specific and confidential Aboriginal and / or Treaty Rights and Interests: Impact Assessment Report. These are not being shared publicly to protect sensitive information.

9.5.2.2 Discipline-Specific Characteristics

In support of the residual effects characteristics described in **Section 6.7.3**, **Table 6-1**, the following Aboriginal and / or Treaty Rights and Interests definitions apply to the effects assessment.

Ecological and Social Context

The assessment of Aboriginal and / or Treaty Rights and Interests incorporated both social and ecological context when characterizing residual impacts. This involved evaluating existing and potential pressures on social, economic, health, and cultural conditions that influence the sensitivity or resilience of valued components. The analysis considered factors such as reversibility of impacts, timing during culturally significant periods, and cumulative stresses that may affect an Indigenous community's ability to exercise rights. Disproportionate effects on specific groups within communities (for example, Elders, women, youth, two-spirit individuals) were addressed through a Gender-Based Analysis Plus approach, recognizing that impacts may be experienced differently across segments of the population and may extend to future generations. Indigenous Knowledge was incorporated where available to inform ecological context, including species sensitivity and resilience. These considerations confirmed that the assessment accounted for both the nature of predicted impacts and the broader social and cultural consequences for Aboriginal and / or Treaty Rights and Interests.

Magnitude

When evaluating the magnitude of effects / impacts, the assessment considers both the proportion of the valued component affected within identified spatial boundaries and the relative effect / impact.

Given the differences in social and ecological context among the valued components, definitions specific to valued components were required. Definitions used for the Aboriginal and / or Treaty Rights and Interests assessment are provided in **Table 9.5-2.**

Table 9.5-2: Magnitude Definitions for Aboriginal and / or Treaty Rights and Interests

Magnitude Level	Definition	Rationale
• **Negligible**	• No or very little discernable change from existing conditions and effect will not interfere with the ability to exercise or practice Aboriginal Treaty and / or Rights and Interests.	• Negligible effects are small and may not be noticeable. These effects do not represent a change in the day-to-day exercise or practice of Aboriginal Treaty and / or Rights and Interests.
• **Low**	• A small, discernable change from existing conditions but effect not expected to materially impede the ability to exercise or practice Aboriginal Treaty and / or Rights and Interests (for example, impacts not expected within areas of preferred or exclusive use, no or little indication there would be an impact on areas of cultural importance, the Indigenous community or group has expressed only minor concerns and has indicated that the Project risks are acceptable or have been sufficiently mitigated or accommodated).	• Low effects may be noticeable to some Indigenous community members. These effects do not represent a change in day-to-day exercise or practice of Aboriginal Treaty and / or Rights and Interests.
• **Moderate**	• A discernable change from existing conditions that is expected to impede the ability to exercise or practice of Aboriginal Treaty and / or Rights and Interests (for example, impacts may occur within areas of preferred use, may be an impact on areas or traditions of cultural importance that may impede ability to access and practice, potential physical or sensory disturbance, the Indigenous community or group has expressed concerns that some impacts remain after mitigation and / or accommodation and the Project may not be compatible with certain aspects of their land use plans or the application of traditional governance and stewardship).	• Moderate effects are noticeable to some Indigenous community members. These effects may or may not represent a change in the exercise or practice of Aboriginal Treaty and / or Rights and Interests.
• **High**	• A discernable change from existing conditions that is expected to severely or totally impede the ability to exercise or practice of Aboriginal Treaty and / or Rights and Interests (for example, impacts expected within areas of preferred use or that are considered high value, likely impact on areas and / or traditions of cultural importance, access to areas used to exercise rights will be disrupted or impeded, the Project may affect traditional laws, knowledge, and / or spiritual and cultural traditions).	• High effects are noticeable to Indigenous community members. These effects represent a notable change in the exercise or practice of Aboriginal Treaty and / or Rights and Interests.

Duration, Frequency, Reversibility and Likelihood

Definitions used for duration, frequency, reversibility, and likelihood for the Aboriginal and / or Treaty Rights and Interests assessment are provided in **Table 9.5-3**. These definitions were developed to provide additional contextual nuance relevant to Indigenous communities and groups and Aboriginal and / or Treaty Rights and Interests.

Table 9.5-3: Duration, Frequency, Reversibility and Likelihood Definitions used for Aboriginal and / or Treaty Rights and Interests Assessment

Impact Characteristic	Definition
• **Duration**	• **Short-term:** impact ends before the end of construction (in other words, within the duration of construction). • **Medium-term:** the impact occurs during construction and ends soon after operation begins and / or maintenance ends, soon after the activity causing the impact ends (in other words, may last up to one generation). • **Long-term:** the impact occurs during construction and persists into operation and / or the impact is considered permanent or the likelihood of reversibility is low or uncertain (in other words, the impact is likely to persist over multiple generations).
• **Frequency**	• **Infrequent:** The impact is expected to occur rarely (in other words, confined to one discrete period). • **Frequent:** The impact is expected to occur intermittently (in other words, daily, weekly, monthly). • **Continuous:** The impact is expected to occur continuously (in other words, the impact would occur constantly).
• **Reversibility**	• **Reversible:** the impact is not permanent (in other words, may be reversed in the short term or within one generation). • **Irreversible:** the impact is permanent (in other words, cannot be reversed in whole or in part).
• **Likelihood**	• **Unlikely:** the impact is not likely to occur. • **Possible:** the impact may occur. • **Probable:** the impact is likely to occur. • **Certain:** the impact will occur.

9.5.2.3 Residual Effects

The residual impact assessment for the Preferred Route considered both temporal phases of the Project: construction and operations. Construction includes site preparation, temporary works, and decommissioning activities, and is expected to take approximately 3 to 10 years. Operations begins after construction and is considered permanent, based on the anticipated timeline for major refurbishments. Results of the

residual impact assessment were shared confidentially with Indigenous communities in their community-specific reports.

The assessment identified potential impacts on Aboriginal and / or Treaty Rights and Interests, recommended mitigation measures, and evaluated residual impacts after mitigation, including severity and prediction confidence. Severity was determined using characteristics such as context, direction, magnitude, geographic extent, duration, frequency, reversibility, and likelihood. Predicted residual impacts were then incorporated into the cumulative impact assessment. Gender-Based Analysis Plus was applied where information on demographic roles and experiences within Indigenous communities was available; however, such data was limited for many communities.

9.5.2.3.1 Indigenous Current Use of Lands and Resources for Traditional Purposes

Potential Impacts

In each community-specific report, a description of the overlap (or lack of overlap) was described and included:

- A map illustrating the Area of Interest in relation to the Study Areas;
- Percentage of Area of Interest overlap with the:
  - Construction Disturbance Area;
  - Aboriginal and / or Treaty Rights and Interests Local Study Area;
  - Aboriginal and / or Treaty Rights and Interests Regional Study Area; and
  - Caribou Regional Study Area.

Based on the results of the above, it was determined if there was a potential for interaction between the Project and each Indigenous community's ability to exercise their rights related to the use of lands and resources for traditional purposes in the Construction Disturbance Area, the Aboriginal and / or Treaty Rights and Interests Local and Regional Study Areas, and the Caribou Regional Study Area.

Predicted Residual Impacts

In each community-specific Aboriginal and / or Treaty Rights and Interests Impact Assessment Report, a description of the potential impact pathways for Cultural Continuity and Well-being were carried forward (for example, changes in the experience of being on the land).

For each indicator pathway carried forward the following assessment sections were completed:

- A description of the potential Project effect on rights. For example, the Project has the potential to affect the experience of being on the land (in terms of freedom from disturbance) due to changes in the air, noise, and visual environments.
- An overview of the potential Project effects after mitigation. For example, noise levels will increase during construction as a result of road and bridge construction and pit / quarry construction and use.
- A description of the potential impacts on rights as a result of the Project. For example, changes to the noise environment, especially during construction, may lead to noticeable changes in noise levels, affecting experiences of peace and solitude.
- A summary of mitigation measures proposed. For example, provide Indigenous communities with advance notices and regular updates regarding location and timing of construction activities, including bridge construction and blasting operations.
- An assessment of predicted residual impacts on rights including context, Project phase(s), direction, magnitude, geographic extent, duration, frequency, reversibility, and likelihood.
- An assessment of the severity of the residual impacts and associated prediction confidence.

A summary of the predicted residual impacts and the determination of severity for the Aboriginal and / or Treaty Rights and Interests valued components was provided in Table 7-3 of each community-specific Aboriginal and / or Treaty Rights and Interests Impact Assessment Report.

9.5.2.3.2 Cultural Continuity and Well-being

Potential Impacts

If an interaction was noted in **Section 9.5.2.3.1**, then an Indigenous community may exercise their rights within these areas. If these rights are negatively impacted, this may, in turn, lead to changes in that Indigenous community's cultural continuity and well-being. In each community-specific report, a description of this interaction was provided.

Predicted Residual Impacts

In each community-specific Aboriginal and / or Treaty Rights and Interests Impact Assessment Report, a description of the potential impact pathways for Cultural Continuity and Well-being were carried forward (for example, changes in the experience of being on the land).

For each indicator pathway carried forward the following assessment sections were completed:

- A description of the potential Project effect on rights. For example, the Project has the potential to affect the experience of being on the land (in terms of freedom from disturbance) due to changes in the air, noise, and visual environments.
- An overview of the potential Project effects after mitigation. For example, noise levels will increase during construction as a result of road and bridge construction and pit / quarry construction and use.
- A description of the potential impacts on rights as a result of the Project. For example, changes to the noise environment, especially during construction, may lead to noticeable changes in noise levels, affecting experiences of peace and solitude.
- A summary of mitigation measures proposed. For example, provide Indigenous communities with advance notices and regular updates regarding location and timing of construction activities, including bridge construction and blasting operations.
- An assessment of predicted residual impacts on rights including context, Project phase(s), direction, magnitude, geographic extent, duration, frequency, reversibility, and likelihood.
- An assessment of the severity of the residual impacts and associated prediction confidence.

A summary of the predicted residual impacts and the determination of severity for the Aboriginal and / or Treaty Rights and Interests valued components was provided in Table 7-3 of each community-specific Aboriginal and / or Treaty Rights and Interests Impact Assessment Report.

It is important to note that the Project will result in some positive effects for the Aboriginal and / or Treaty Rights and Interests valued components.

Changes in Access to Sites and Areas Used for Traditional Purposes: The Project will enhance connectivity to remote regions and expand access to sites and areas that support traditional land and resource use, including:

- Access to harvesting areas and opening locations that were previously difficult to reach and supporting hunting, trapping, and fishing for local Indigenous communities.
- Access to sites used for traditional activities, including hunting, trapping, fishing, and gathering.
- Access to previously isolated grounds for berry picking and medicinal plant gathering.
- Access to local harvesting of traditional foods and support for community food sharing.
- Access to traplines, improving mobility for trappers.
- Access to areas used for ceremonial and spiritual practices.

The Project will improve access to currently remote areas and may benefit Indigenous communities already connected to the provincial road network by making it easier to exercise traditional land use rights. Shorter and safer travel to hunting, trapping, and fishing grounds can extend seasons, lower costs, and strengthen traditional harvesting. New routes to berry patches and medicinal plant sites support gathering across seasons, while better access to traplines supports set up and maintenance. Improved connectivity to ceremonial and teaching places reinforces cultural practices and intergenerational knowledge transfer. Enhanced access to the land can also bolster food security and sustain community food sharing.

Changes to Connection to the Land and Ability to Practice and Transmit Cultural Traditions: Positive impacts that could result from the Project include improved access to, and use of, traditional lands, teaching sites, and cultural areas, supporting the following outcomes:

- Elders and knowledge holders can more readily teach how to hunt, fish, trap, and process foods, strengthening intergenerational knowledge transfer.
- Time on the land strengthens life skills and cultural values alongside technical harvesting skills.
- Increased time on the land supports everyday use of Indigenous languages and helps counter language loss tied to disconnection from traditional practices.

- Traditional activities engage men, women, youth, and children in preparing, cooking, and distributing country foods, reinforcing communal roles and responsibilities.
- Sharing harvested foods strengthens social bonds and intergenerational ties, promotes distribution, and enhances food security.
- Easier access enables more frequent participation in harvesting and cultural activities, deepening connections to language, culture, and ways of life.
- Improved mobility supports communities seeking to renew and revitalize cultural traditions and practices on the land.

By improving access to traditional lands and teaching sites, the Project is also expected to deliver positive outcomes. Elders and knowledge holders can more readily teach hunting, fishing, trapping, and food processing, strengthening intergenerational knowledge transfer. More time on the land reinforces life skills and cultural values alongside technical harvesting and supports everyday use of Indigenous languages. The whole community becomes engaged in preparing and sharing country foods, strengthening social bonds and enhancing food security. Easier access encourages participation in cultural activities and deepens connections to language and culture.

Improved access to the land enables Elders and knowledge holders to teach hunting, fishing, trapping, and food processing, strengthening intergenerational knowledge transfer. More time on the land builds life skills and cultural values alongside technical harvesting and supports everyday use of Indigenous languages. Traditional activities engage the whole community in preparing and sharing country foods, reinforcing roles, social bonds, and food security. Easier access increases participation and deepens connections to language and culture, while overall mobility supports the renewal and revitalization of land-based traditions.

9.5.3 Acoustic Environment

9.5.3.1 Project-Environment Interactions

As a component of the effects assessment, the Project activities for Acoustics were reviewed to find potential environmental interactions. These interactions were then assessed for potential effect (**Table 9.5-4**).

Table 9.5-4: Project-Environment Interactions - Acoustic Environment

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• **Construction**	• Temporary Construction Staging Areas	• Noise and Vibration	• Continuous 1-hour equivalent sound level • Day-night sound level • Daytime sound level (Footnote a) • Percent highly annoyed • Peak particle ground vibration velocity • Root-mean square ground vibration velocity	• Potential interactions between temporary construction staging areas construction and noise and vibration are anticipated. • Potential effects associated with this activity are further described in this Application.
• **Construction**	• Temporary Access Roads and Trails	• Noise and Vibration	• Continuous 1-hour equivalent sound level • Day-night sound level • Daytime sound level (Footnote a) • Percent highly annoyed • Peak particle ground vibration velocity • Root-mean square ground vibration velocity	• Potential interactions between temporary access road and trail construction and noise and vibration are anticipated. • Potential effects associated with this activity are further described in this Application.
• **Construction**	• Temporary Construction Camps	• Noise and Vibration	• Continuous 1-hour equivalent sound level • Day-night sound level • Daytime sound level (Footnote a) • Percent highly annoyed • Peak particle ground vibration velocity • Root-mean square ground vibration velocity	• Potential interactions between temporary construction camp construction and noise and vibration are anticipated. • Potential effects associated with this activity are further described in this Application.
• **Construction**	• Right-of-way Clearing and Grubbing	• Noise and Vibration	• Continuous 1-hour equivalent sound level • Day-night sound level • Daytime sound level (Footnote a) • Percent highly annoyed • Peak particle ground vibration velocity • Root-mean square ground vibration velocity	• Potential interactions between right-of-way clearing and grubbing and noise and vibration are anticipated. • Potential effects associated with this activity are further described in this Application.
• **Construction**	• Pits and Quarries	• Noise and Vibration	• Continuous 1-hour equivalent sound level • Day-night sound level • Daytime sound level (Footnote a) • Percent highly annoyed • Peak particle ground vibration velocity • Root-mean square ground vibration velocity • Air overpressure	• Potential interactions between pit and quarry use and noise and vibration are anticipated. • Potential effects associated with this activity are further described in this Application.
• **Construction**	• Temporary Concrete Batch Plants	• Noise and Vibration	• Continuous 1-hour equivalent sound level • Day-night sound level • Daytime sound level (Footnote a) • Percent highly annoyed • Peak particle ground vibration velocity • Root-mean square ground vibration velocity	• Potential interactions between the use of temporary concrete batch plants and noise and vibration are anticipated. • Potential effects associated with this activity are further described in this Application.
• **Construction**	• Drilling / Blasting / Aggregate Production	• Noise and Vibration	• Continuous 1-hour equivalent sound level • Day-night sound level • Daytime sound level (Footnote a) • Percent highly annoyed • Peak particle ground vibration velocity • Root-mean square ground vibration velocity • Air overpressure	• Potential interactions between aggregate production, including drilling and blasting, and noise and vibration are anticipated. • Potential effects associated with this activity are further described in this Application.

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• **Construction**	• Road Construction (stripping, subgrade excavation, embankment fill placement, grading, ditching)	• Noise and Vibration	• Continuous 1-hour equivalent sound level • Day-night sound level • Daytime sound level (Footnote a) • Percent highly annoyed • Peak particle ground vibration velocity • Root-mean square ground vibration velocity	• Potential interactions between road construction and noise and vibration are anticipated. • Potential effects associated with this activity are further described in this Application.
• **Construction**	• Bridge and Culvert Installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls)	• Noise and Vibration	• Continuous 1-hour equivalent sound level • Day-night sound level • Daytime sound level (Footnote a) • Percent highly annoyed • Peak particle ground vibration velocity • Root-mean square ground vibration velocity	• Potential interactions between bridge and culvert construction and noise and vibration are anticipated. • Potential effects associated with this activity are further described in this Application.
• **Construction**	• Construction Site Restoration	• Noise and Vibration	• Continuous 1-hour equivalent sound level • Day-night sound level • Daytime sound level (Footnote a) • Percent highly annoyed • Peak particle ground vibration velocity • Root-mean square ground vibration velocity	• Potential interactions between construction site restoration and noise and vibration are anticipated. • Potential effects associated with this activity are further described in this Application.
• **Construction**	• Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*.	• Noise and Vibration	• Continuous 1-hour equivalent sound level • Day-night sound level • Daytime sound level (Footnote a) • Percent highly annoyed • Peak particle ground vibration velocity • Root-mean square ground vibration velocity	• Potential interactions between pit and quarry decommissioning and noise and vibration are anticipated. • Potential effects associated with this activity are further described in this Application.
• **Construction**	• Decommissioning of Temporary Camps, Roads / Trails, and Staging Areas	• Noise and Vibration	• Continuous 1-hour equivalent sound level • Day-night sound level • Daytime sound level (Footnote a) • Percent highly annoyed • Peak particle ground vibration velocity • Root-mean square ground vibration velocity	• Potential interactions between decommissioning of temporary camps, roads, trails and staging areas and noise and vibration are anticipated. • Potential effects associated with this activity are further described in this Application.
• **Operations**	• Road Usage	• Noise and Vibration	• Day-night sound level • Daytime sound level (Footnote a) • Nighttime sound level • Maximum nighttime sound level • Percent highly annoyed • Peak particle ground vibration velocity • Root-mean square ground vibration velocity	• Potential interactions between road usage and noise and vibration are anticipated. • Potential effects associated with this activity are further described in this Application.
• **Operations**	• Maintenance (Footnote b)	• Noise and Vibration	• Continuous 1-hour equivalent sound level • Day-night sound level • Daytime sound level (Footnote a) • Percent highly annoyed • Peak particle ground vibration velocity • Root-mean square ground vibration velocity	• Potential interactions between maintenance and noise and vibration are anticipated. • Potential effects associated with this activity are further described in this Application.

Footnotes: (a) The definition of daytime sound level depends on the guidance document being considered. When assessing construction and operations activities, daytime sound level is defined as 7 a.m. to 10 p.m. When assessing road usage, daytime sound level is defined as 7 a.m. to 11 p.m.

(b) Includes general maintenance (for example grading, erosion control, quarrying, pits), seasonal maintenance (for example snow clearing, bridge and culvert maintenance), and special maintenance (for example slope failures, road settlement / break up).

9.5.3.2 Discipline-Specific Characteristics

In support of the residual effects characteristics described in **Section 6.7.3**, **Table 6-1**, the following acoustic definitions apply to the effects assessment.

Ecological and Social Context

Ecological context for the acoustic and vibration environment valued component considers noise and vibration sensitivity, timing of an effect in relation to the duration and frequency of use of identified points of reception, applicable legislation and best management practices. The current and future sensitivity of the acoustic and vibration environment to change caused by the Community Access Road are considered and includes Indigenous Knowledge where it was available.

Magnitude

For magnitude, environmental discipline-specific definitions are required and are provided in **Table 9.5-5**. Magnitude of effects are project-related and exclude variations due to climate change.

Table 9.5-5: Acoustic and Vibration Valued Component

Valued Component	Definition	Rationale
• **Noise**	• Project noise levels do not exceed federal and provincial limits	• Established noise limits based on federal and provincial guidance
• **Vibration**	• Project vibration levels do not exceed reference municipal and industry limits	• Established vibration limits based on municipal (within Ontario) guidance and standard industry thresholds
• **Noise**	• Project noise levels exceed federal and provincial limits	• Established noise limits based on federal and provincial guidance
• **Vibration**	• Project vibration levels exceed reference municipal and industry limits	• Established vibration limits based on municipal (within Ontario) guidance and standard industry thresholds

9.5.3.3 Residual Effects – Construction Phase

9.5.3.3.1 Changes to Noise Level

9.5.3.3.1.1 Potential Effects

Noise levels can be expected to increase, on occasion, due to construction activities at the potential points of reception, but construction noise will be temporary in nature and

localized within the Local Study Area. The range in increased noise levels associated with construction activities will depend primarily on the number and type of noise sources and their proximity to the points of reception (in other words, the Project noise levels in the environment decrease as the distance between the points of reception and construction activities increases).

Table 9.5-6, **Table 9.5-7**, and **Table 9.5-8** and **Figure 9.5-2**, **Figure 9.5-3**, and **Figure 9.5-4** present the predicted noise levels from road construction, bridge construction, and pit and quarry construction and use, respectively, associated with the Project. The tables also indicate the applicable noise limit for each parameter and indicates where noise levels exceed these limits in bold / underline.

The results in **Table 9.5-6** and **Figure 9.5-2** indicate that during road construction, noise levels may exceed Health Canada's daytime criteria for speech comprehension and day-night criteria for noise complaints (in other words, 55 A-weighted decibels) at points of reception within 1,000 metres of the effects assessment Construction Disturbance Area along the Community Access Road. It also indicates that exceedances of Health Canada's change in percent highly annoyed criteria may occur at points of reception within the Local Study Area.

The results in **Table 9.5-7** and **Figure 9.5-3** indicate that during bridge construction, noise levels may exceed Health Canada's daytime criteria for speech comprehension and day-night criteria for noise complaints (in other words, 55 A-weighted decibels) and change in percent highly annoyed criteria at points of reception within the Local Study Area.

The results in **Table 9.5-8** and **Figure 9.5-4** indicate that during construction and use of pits and quarries, noise levels may exceed Health Canada's daytime criteria for speech comprehension and day-night criteria for noise complaints (in other words, 55 A-weighted decibels) and change in percent highly annoyed criteria at points of reception within 200 metres of the effects assessment Construction Disturbance Area surrounding the pits and quarries.

Table 9.5-6: Summary of Predicted Noise Levels at Points of Reception During Road Construction

Distances from the Construction Disturbance Area	Number of Potential Points of Reception – No Habitation Expected (Footnote a)	Number of Potential Points of Reception – Habitation May Occur (Footnote b)	Project Daytime (Footnote c) Noise Level (dBA)	Existing + Project Daytime (Footnote c) Noise Level (dBA)	Existing + Project Day-Night Noise Level (dBA) (Footnote d), (Footnote e)	Change in Percent Highly Annoyed (percent) (Footnote d)
Applicable Noise Limit	Not applicable	Not applicable	Not applicable	55 (Footnote f)	55 (Footnote f)	6.5 (f)
Edge of Construction Disturbance Area(a)	76	0	74 to 75	**74 to 75**	Not applicable	Not applicable
Construction Disturbance Area to 100 m	3	1	71 to 75	**71 to 75**	**68**	**44.9**
100 to 200 m	11	1	62 to 70	**62 to 70**	**65**	**35.3**
200 to 300 m	4	1	61 to 64	**61 to 64**	**61**	**24.0**
300 to 400 m	9	2	58 to 64	**58 to 64**	**56 to 59**	**13.4 to 19.2**
400 to 500 m	5	1	56 to 62	**56 to 62**	**60**	**21.5**
500 to 600 m	11	3	55 to 62	55 to **62**	**58 to 58**	**17.1 to 17.1**
600 to 1,000 m	16	7	49 to 60	49 to **60**	48 to **56**	3.6 to **13.4**
1,000 to edge of Local Study Area	103	48	27 to 55	38 to 55	41 to 52	0.1 to **7.8**

Footnotes: **Bold** indicates exceedance of applicable noise limit

(a) Land uses where habitation (in other words, sleep) is not expected to occur included recreation, animal, fish and plant harvest, and cultural, spiritual, and sacred.

(b) Locations where habitation may occur included outfitter camps and locations identified as habitation through Indigenous Knowledge.

(c) Daytime is defined as 7 a.m. to 10 p.m.

(d) Day-night noise level and percent highly annoyed criteria are only applicable for points of reception where habitation may occur.

(e) As no Project Construction is expected to occur during the nighttime, the existing nighttime noise level of 33 A-weighted decibels was used to calculate the day-night noise level.

(f) Source: Health Canada Noise Guidance (Health Canada, 2023).

Table 9.5-7: Summary of Predicted Noise Levels at Points of Reception During Bridge Construction

Distances from the Construction Disturbance Area	Number of Potential Points of Reception – No Habitation Expected (Footnote a)	Number of Potential Points of Reception – Habitation May Occur (Footnote b)	Project Daytime (Footnote c) Noise Level (dBA)	Existing + Project Daytime (Footnote c) Noise Level (dBA)	Existing + Project Day-Nigh Noise Level (dBA) (Footnote d), (Footnote e)	Change in Percent Highly Annoyed (percent) (Footnote d)
Applicable Noise Limit	Not applicable	Not applicable	Not applicable	55 (Footnote f)	55 (Footnote f)	6.5 (Footnote f)
Edge of Construction Disturbance Area[a]	18	0	83 to 84	**83 to 84**	Not applicable	Not applicable
Construction Disturbance Area to 100 m	2	0	76	**76**	Not applicable	Not applicable
100 to 200 m	6	1	71 to 76	**71 to 76**	**69**	**48.2**
200 to 300 m	2	0	68 to 70	**68 to 70**	Not applicable	Not applicable
300 to 400 m	9	2	56 to 67	**56 to 67**	**62 to 65**	**26.6 to 35.3**
400 to 500 m	1	0	60	**60**	Not applicable	Not applicable
500 to 600 m	7	4	57 to 64	**57 to 64**	55 to **62**	**11.8 to 26.6**
600 to 1,000 m	17	4	49 to 61	49 to **61**	55 to **56**	**11.8 to 13.4**
1,000 to edge of Local Study Area	109	32	26 to 56	38 to **56**	41 to 53	0 to **9.0**

Footnotes: **Bold** indicates exceedance of applicable noise limit

(a) Land uses where habitation (in other words, sleep) is not expected to occur included recreation, animal, fish and plant harvest, and cultural, spiritual, and sacred.

(b) Locations where habitation may occur included outfitter camps and locations identified as habitation through Indigenous Knowledge.

(c) Daytime is defined as 7 a.m. to 10 p.m.

(d) Day-night noise level and percent highly annoyed criteria are only applicable for points of reception where habitation may occur.

(e) As no Project Construction is expected to occur during the nighttime, the existing nighttime noise level of 33 A-weighted decibels was used to calculate the day-night noise level.

(f) Source: Health Canada Noise Guidance (Health Canada, 2023).

Table 9.5-8: Summary of Predicted Noise Levels at Points of Reception During Pit and Quarry Use During Construction

Distances from the Construction Disturbance Area	Number of Potential Points of Reception – No Habitation Expected (Footnote a)	Number of Potential Points of Reception – Habitation May Occur (Footnote b)	Project Daytime (Footnote c) Noise Level (dBA)	Existing + Project Daytime (Footnote c) Noise Level (dBA)	Existing + Project Dau-Night Noise Level (dBA) (Footnote d), (Footnote e)	Change in Percent Highly Annoyed (percent) (Footnote d)
Applicable Noise Limit	Not applicable	Not applicable	Not applicable	55 (Footnote f)	55 (Footnote f)	6.5 (Footnote f)
Edge of Construction Disturbance Area[a]	44	3	55 to 81	55 to **81**	**56 to 68**	**13.4 to 44.9**
Construction Disturbance Area to 100 m	15	0	56 to 68	**56 to 68**	Not applicable	Not applicable
100 to 200 m	5	2	46 to 60	47 to **60**	46 to **58**	2.5 to **17.1**
200 to 300 m	6	0	42 to 55	43 to 55	Not applicable	Not applicable
300 to 400 m	10	0	42 to 54	43 to 54	Not applicable	Not applicable
400 to 500 m	1	2	44 to 50	45 to 50	47 to 49	3.0 to 4.2
500 to 600 m	9	3	46 to 54	47 to 54	46 to 49	2.1 to 4.2
600 to 1,000 m	17	7	40 to 52	42 to 52	44 to 47	1.5 to 3.0
1,000 to edge of Local Study Area	94	23	10 to 44	38 to 45	38 to 44	0.0 to 1.2

Footnotes: **Bold** indicates exceedance of applicable noise limit

(a) Land uses where habitation (in other words, sleep) is not expected to occur included recreation, animal, fish and plant harvest, and cultural, spiritual, and sacred.

(b) Locations where habitation may occur included outfitter camps and locations identified as habitation through Indigenous Knowledge.

(c) Daytime is defined as 7 a.m. to 10 p.m.

(d) Day-night noise level and percent highly annoyed criteria are only applicable for points of reception where habitation may occur.

(e) As no Project Construction is expected to occur during the nighttime, the existing nighttime noise level of 33 A-weighted decibels was used to calculate the day-night noise level.

(f) Source: Health Canada Noise Guidance (Health Canada, 2023).

Figure 9.5-2: Noise Modelling Results – Road Construction

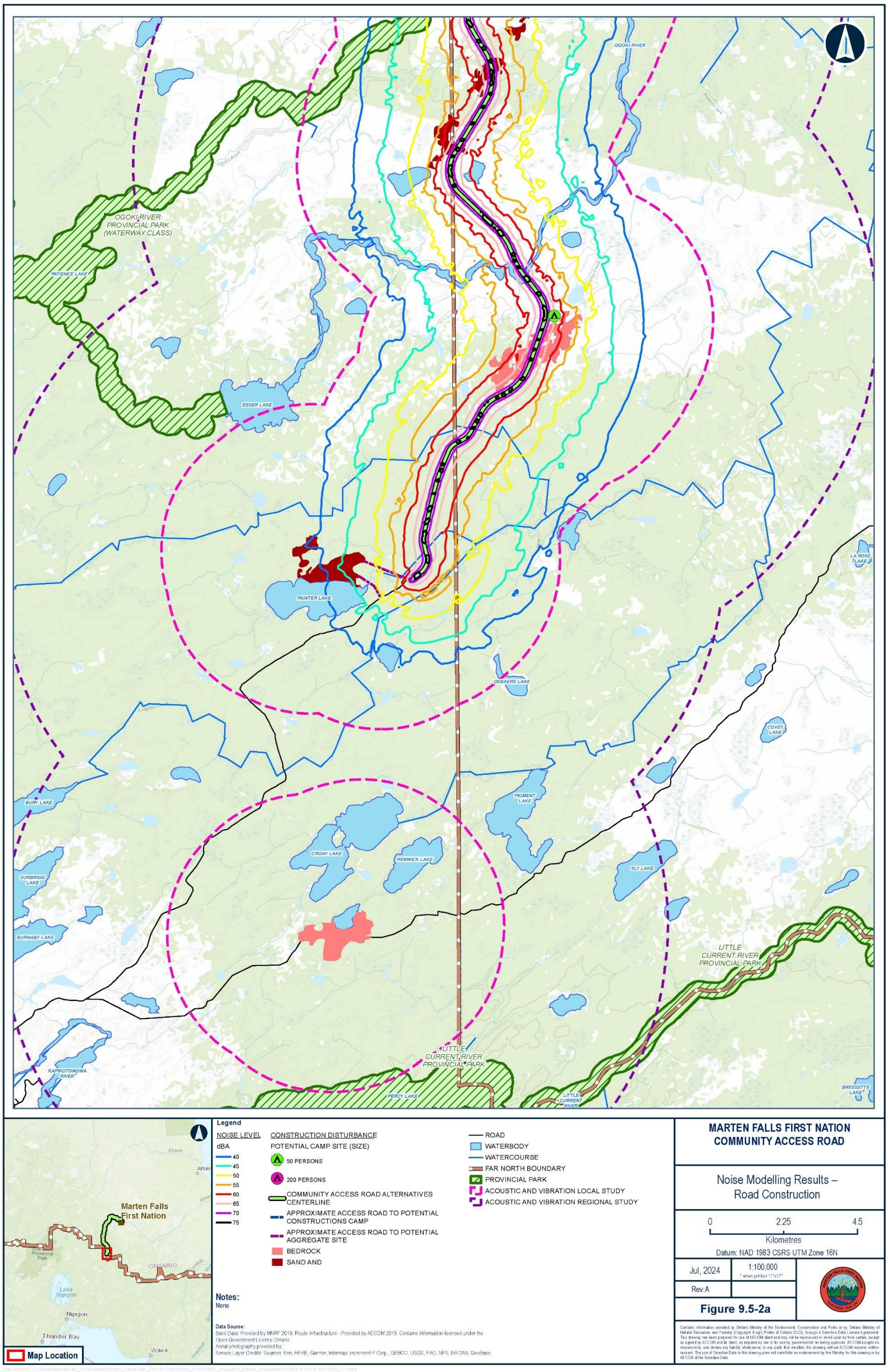


Figure 9.5-2b: Noise Modelling Results – Road Construction

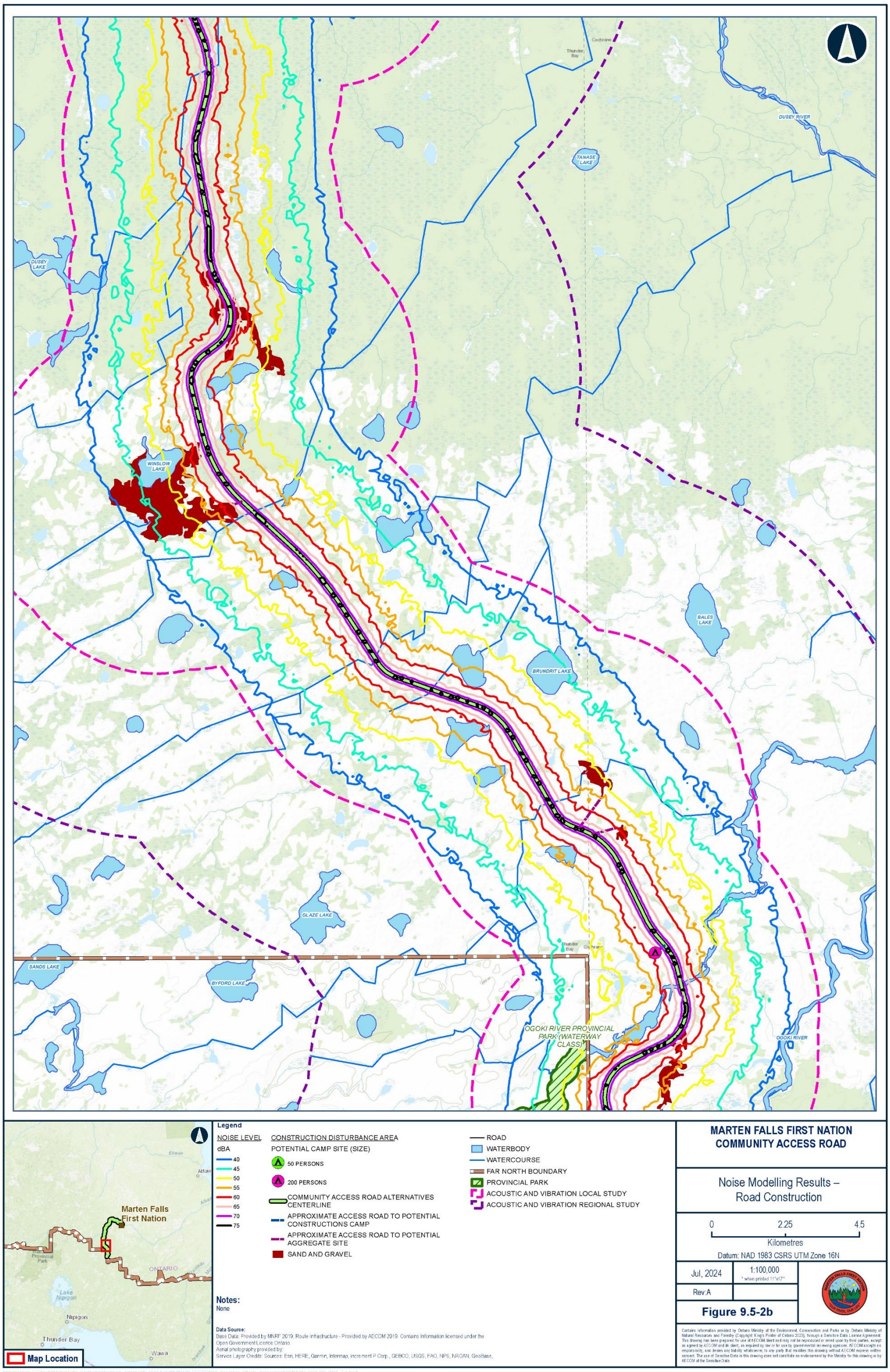


Figure 9.5-2c: Noise Modelling Results – Road Construction

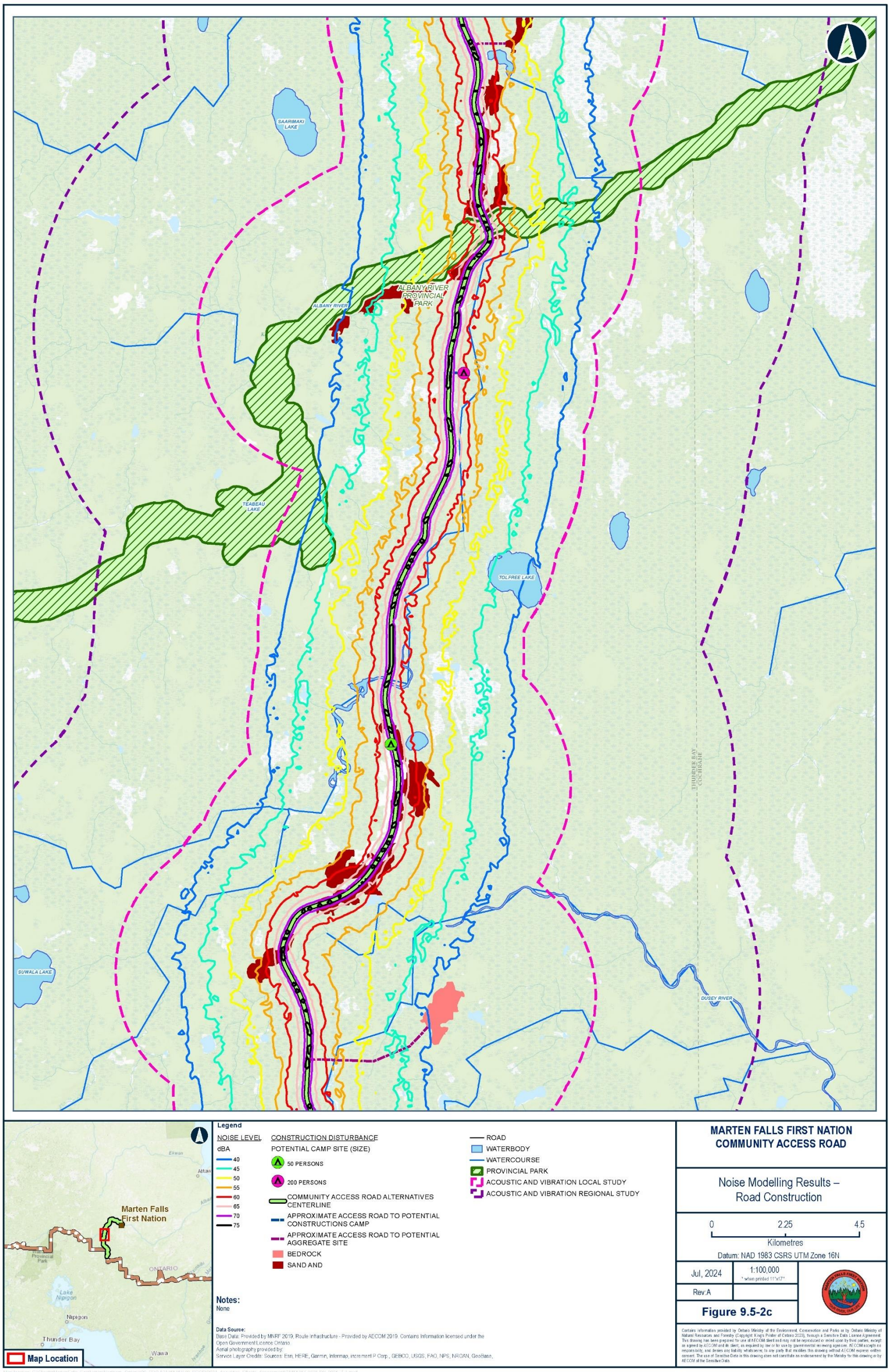


Figure 9.5-2d: Noise Modelling Results – Road Construction

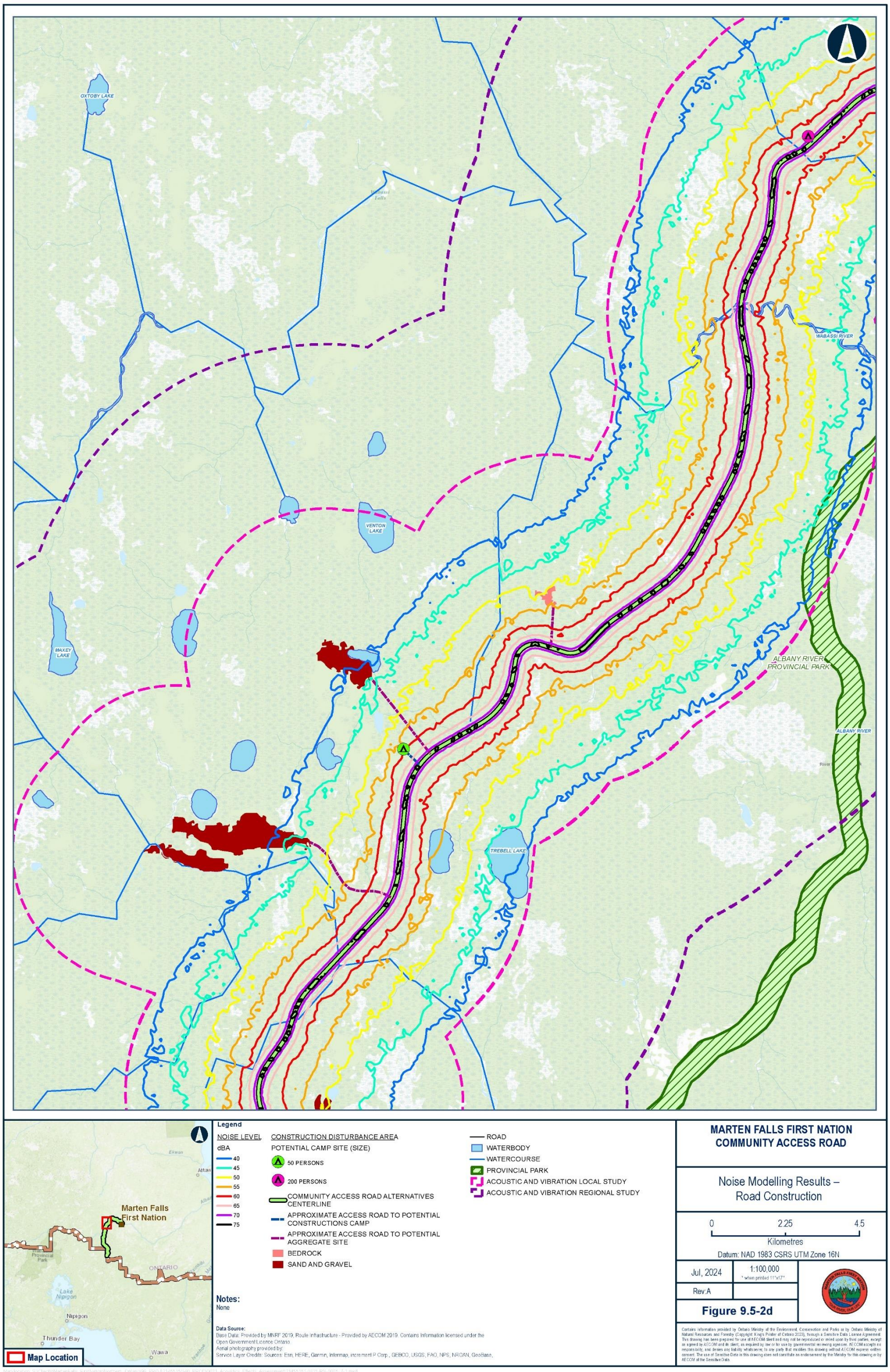


Figure 9.5-2e: Noise Modelling Results – Road Construction

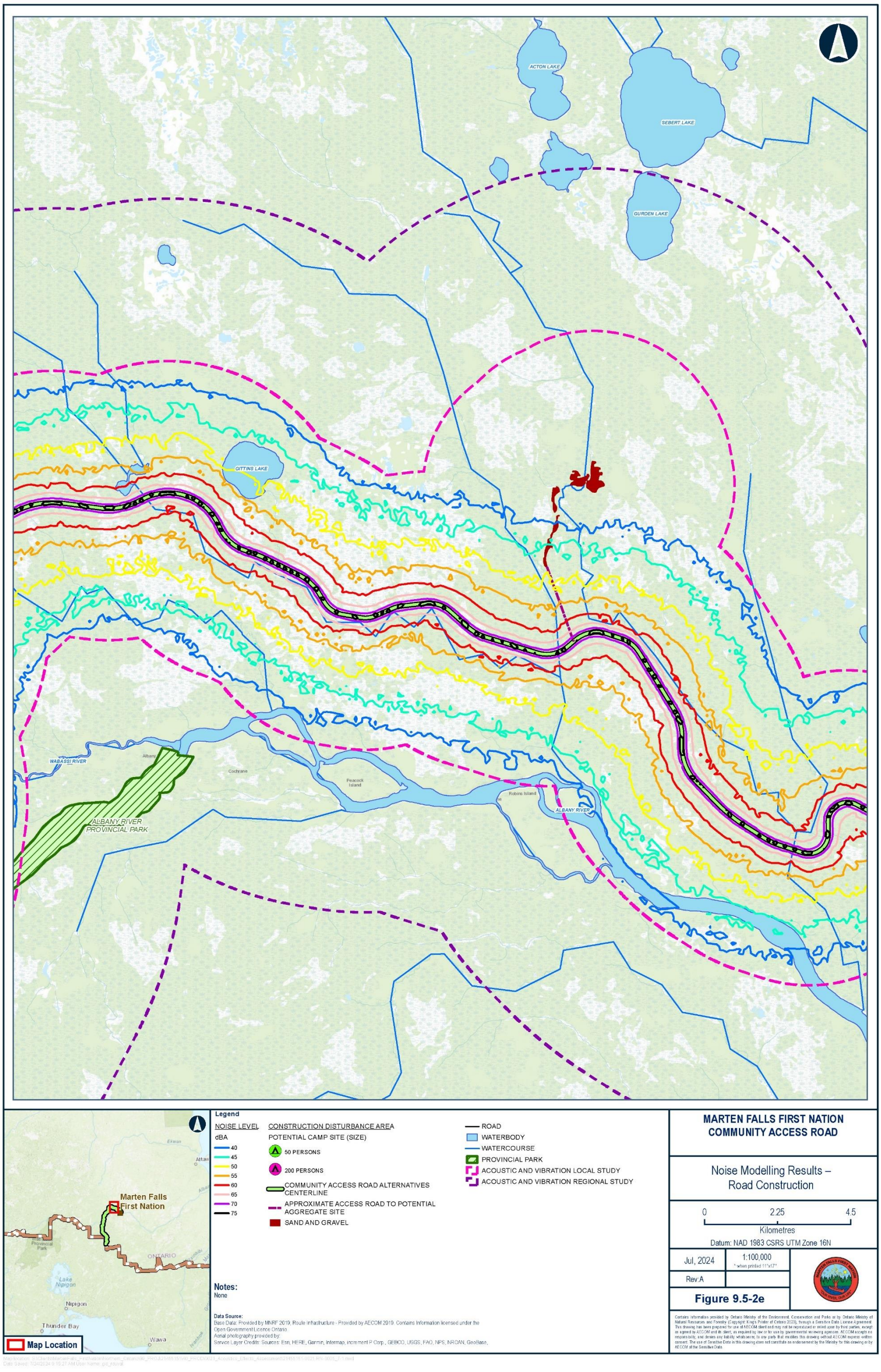


Figure 9.5-2f: Noise Modelling Results – Road Construction

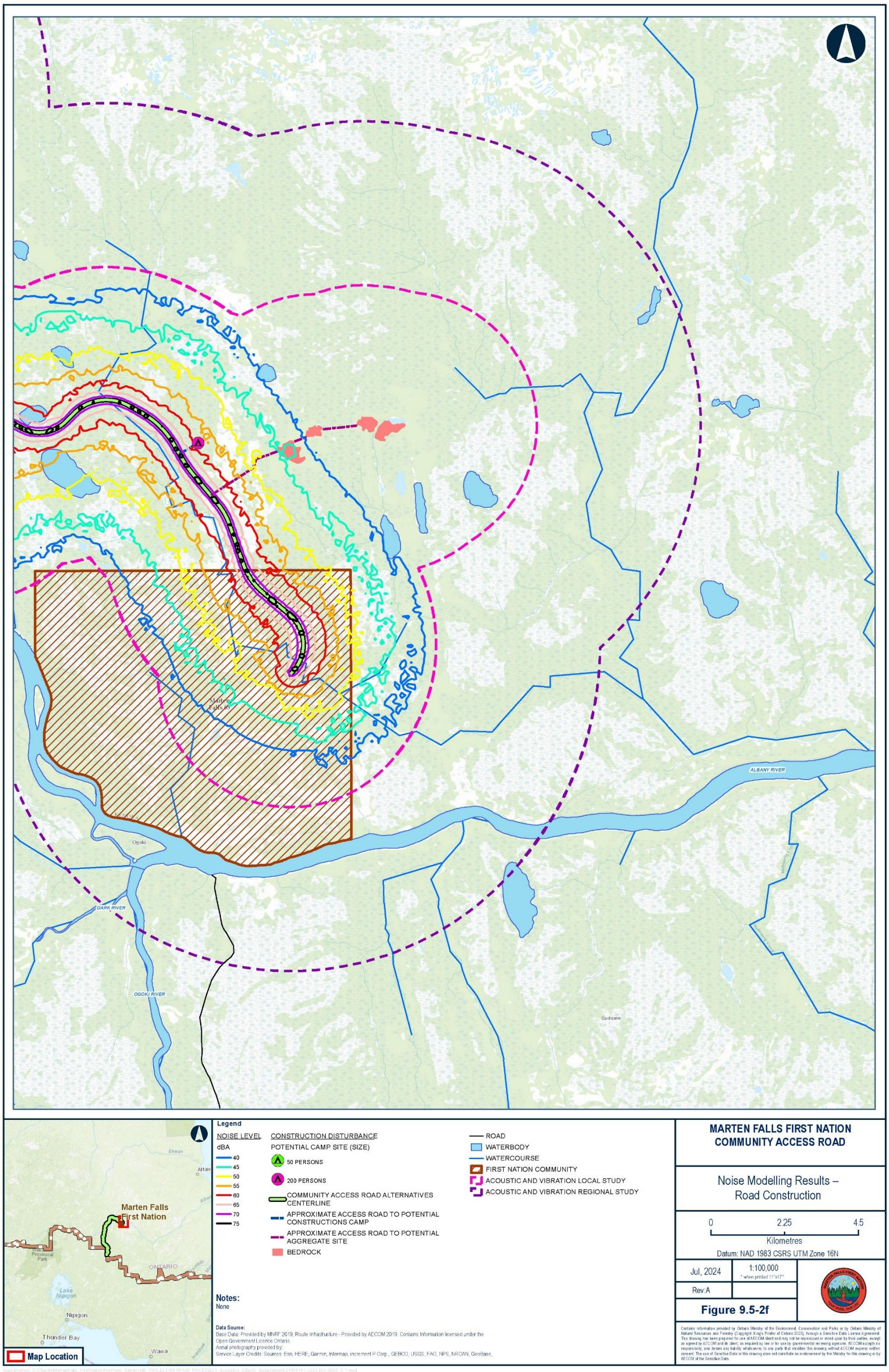


Figure 9.5-3: Noise Modelling Results – Bridge Construction

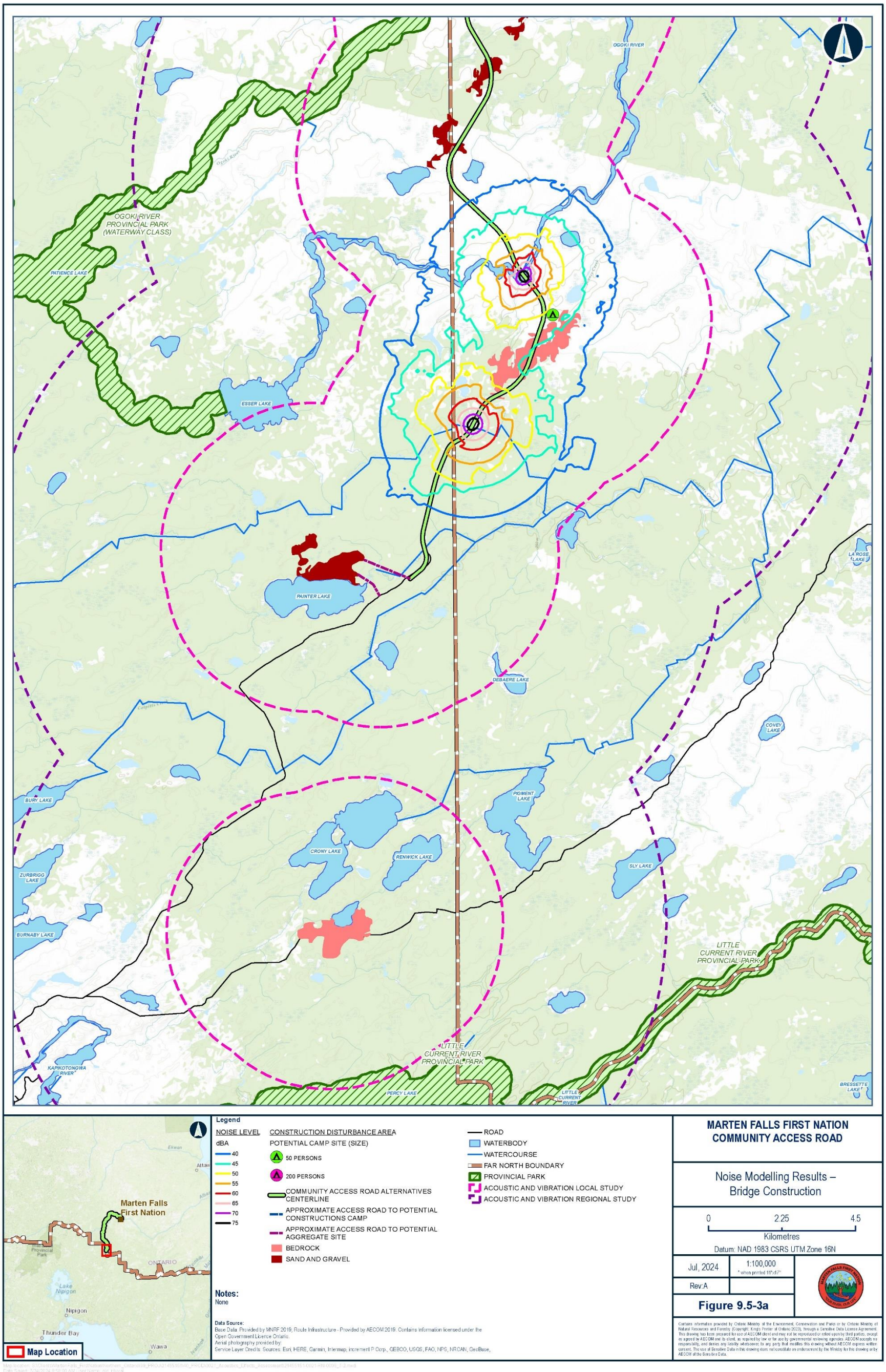


Figure 9.5-3b: Noise Modelling Results – Bridge Construction

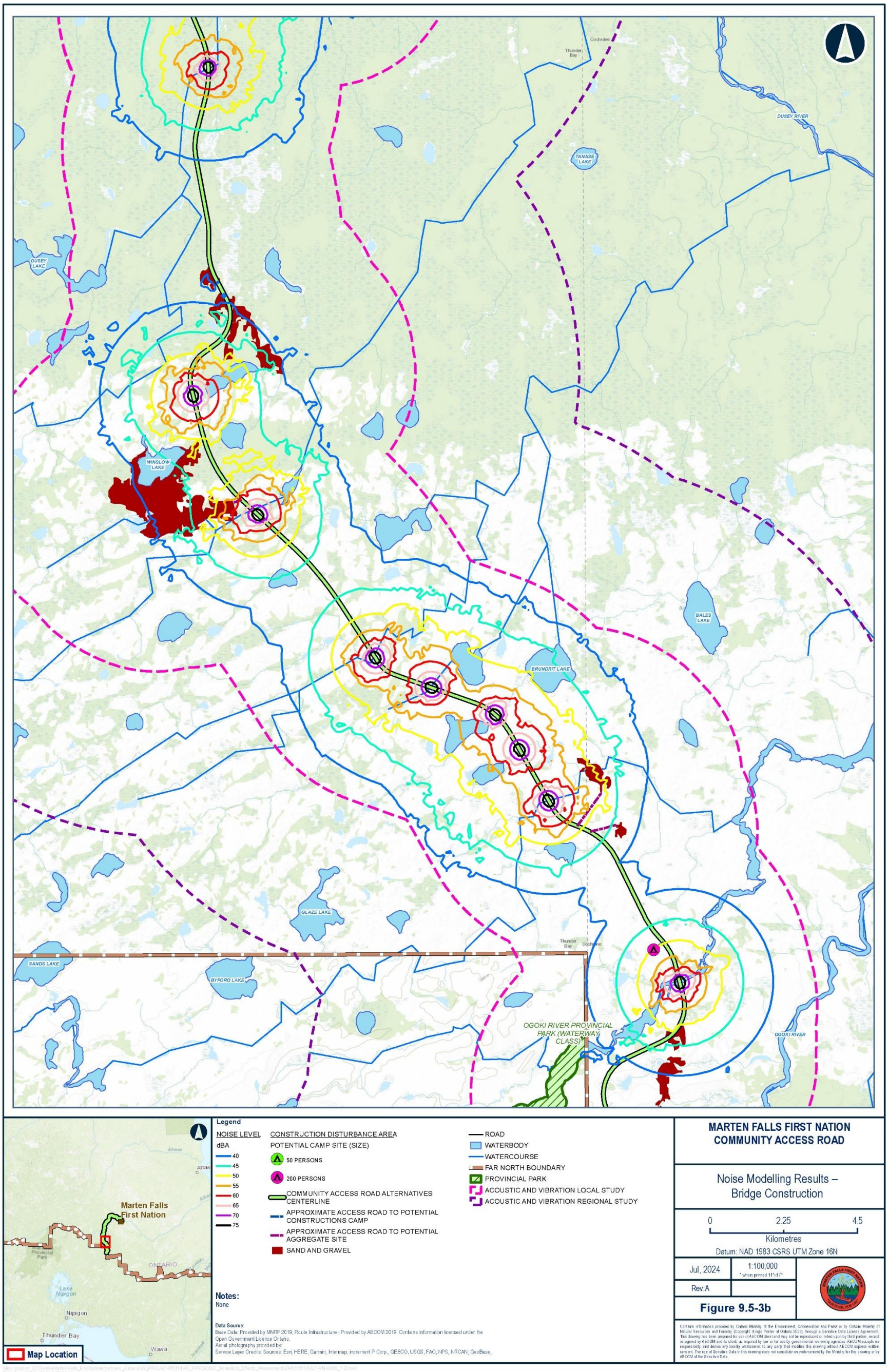


Figure 9.5-3c: Noise Modelling Results – Bridge Construction

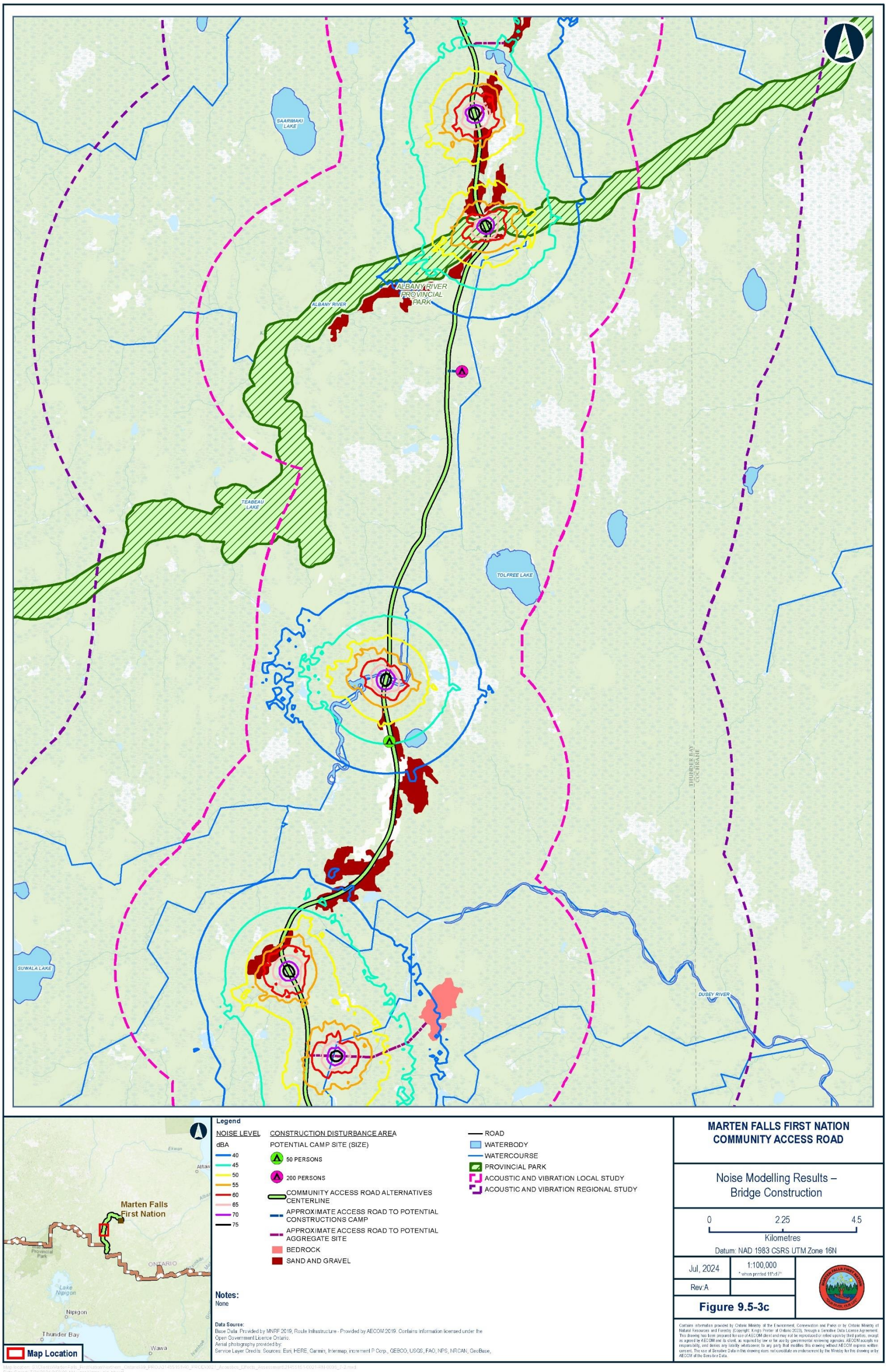


Figure 9.5-3d: Noise Modelling Results – Bridge Construction

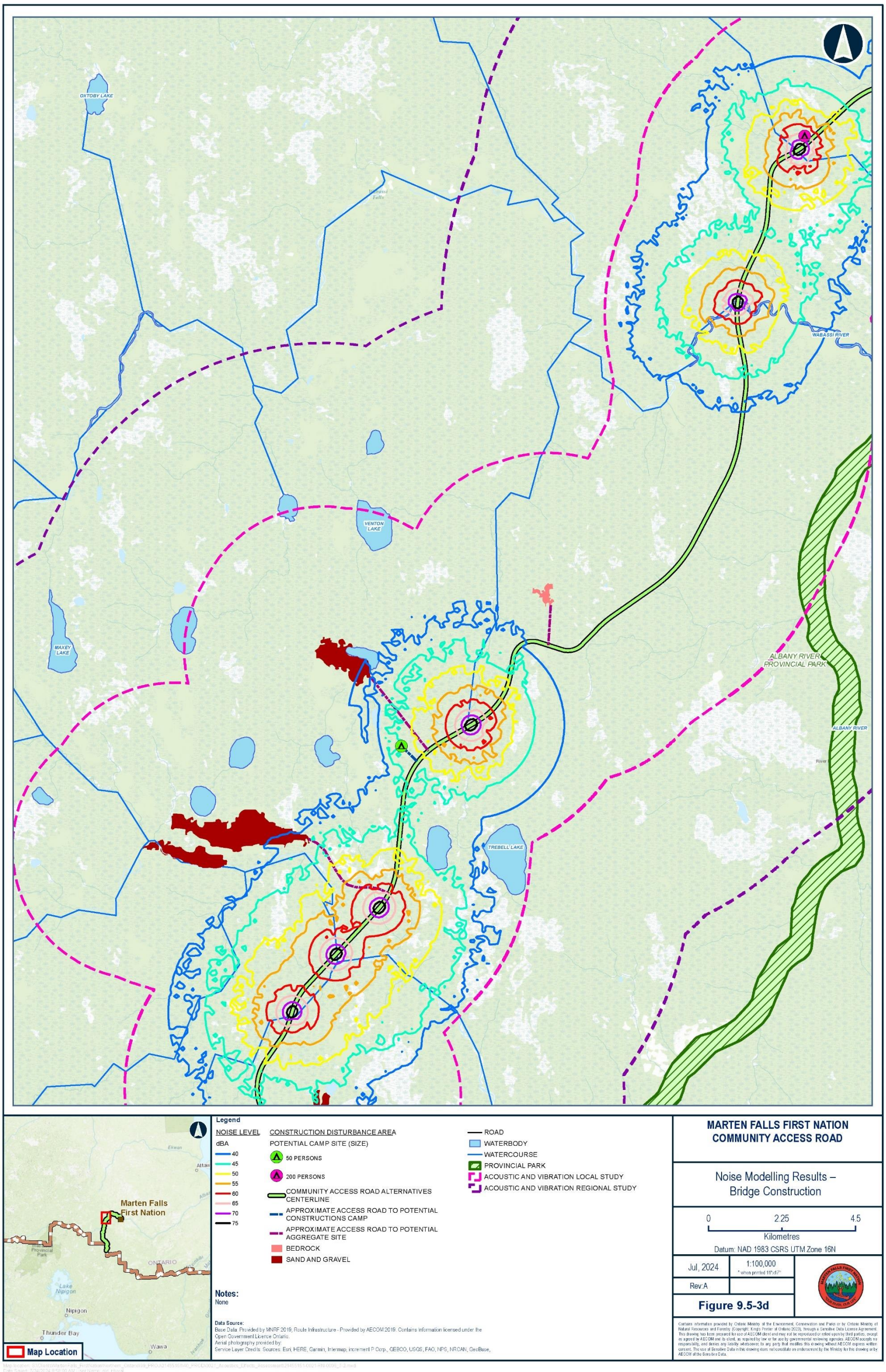


Figure 9.5-3e: Noise Modelling Results – Bridge Construction

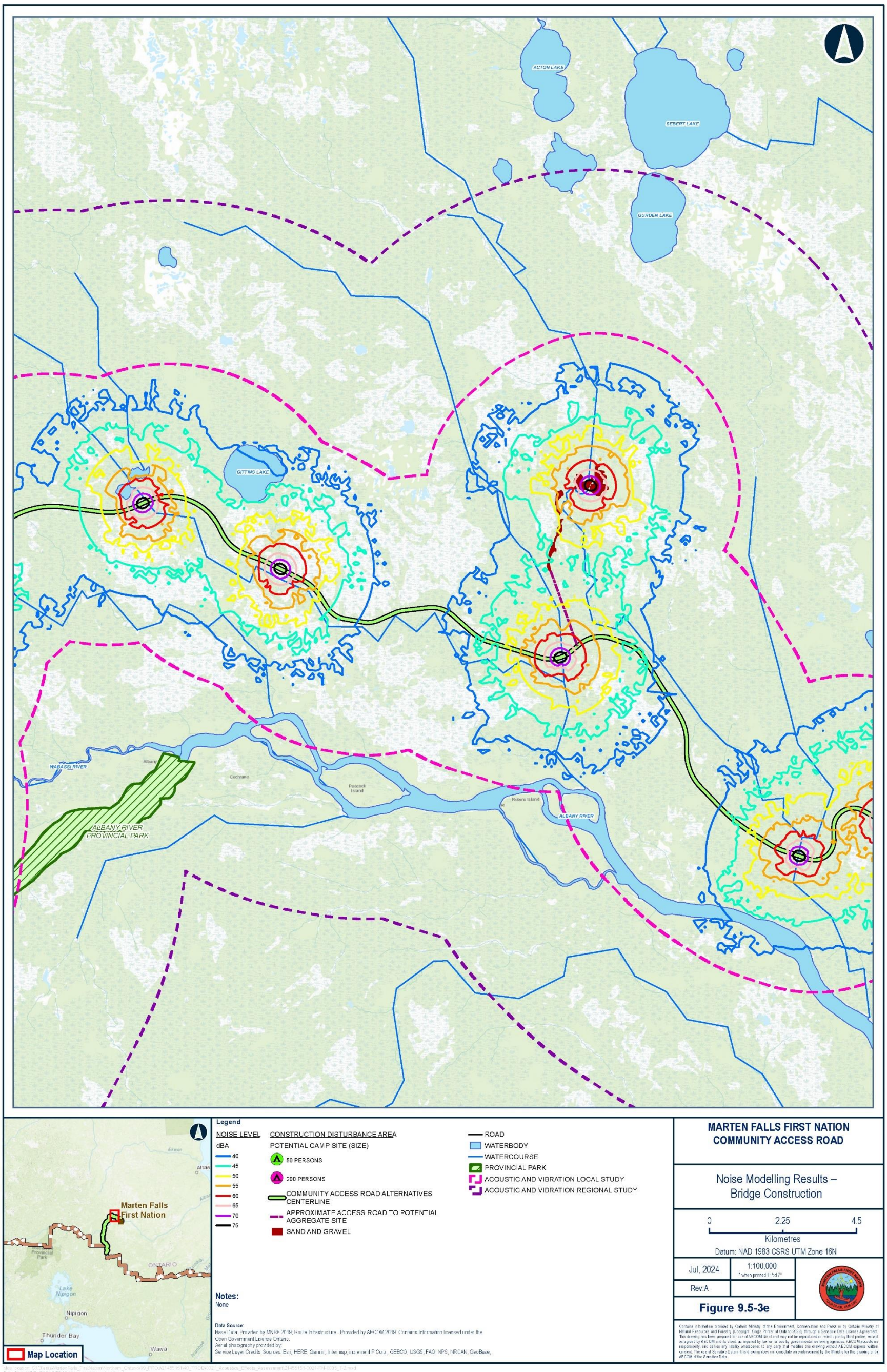


Figure 9.5-3f: Noise Modelling Results – Bridge Construction

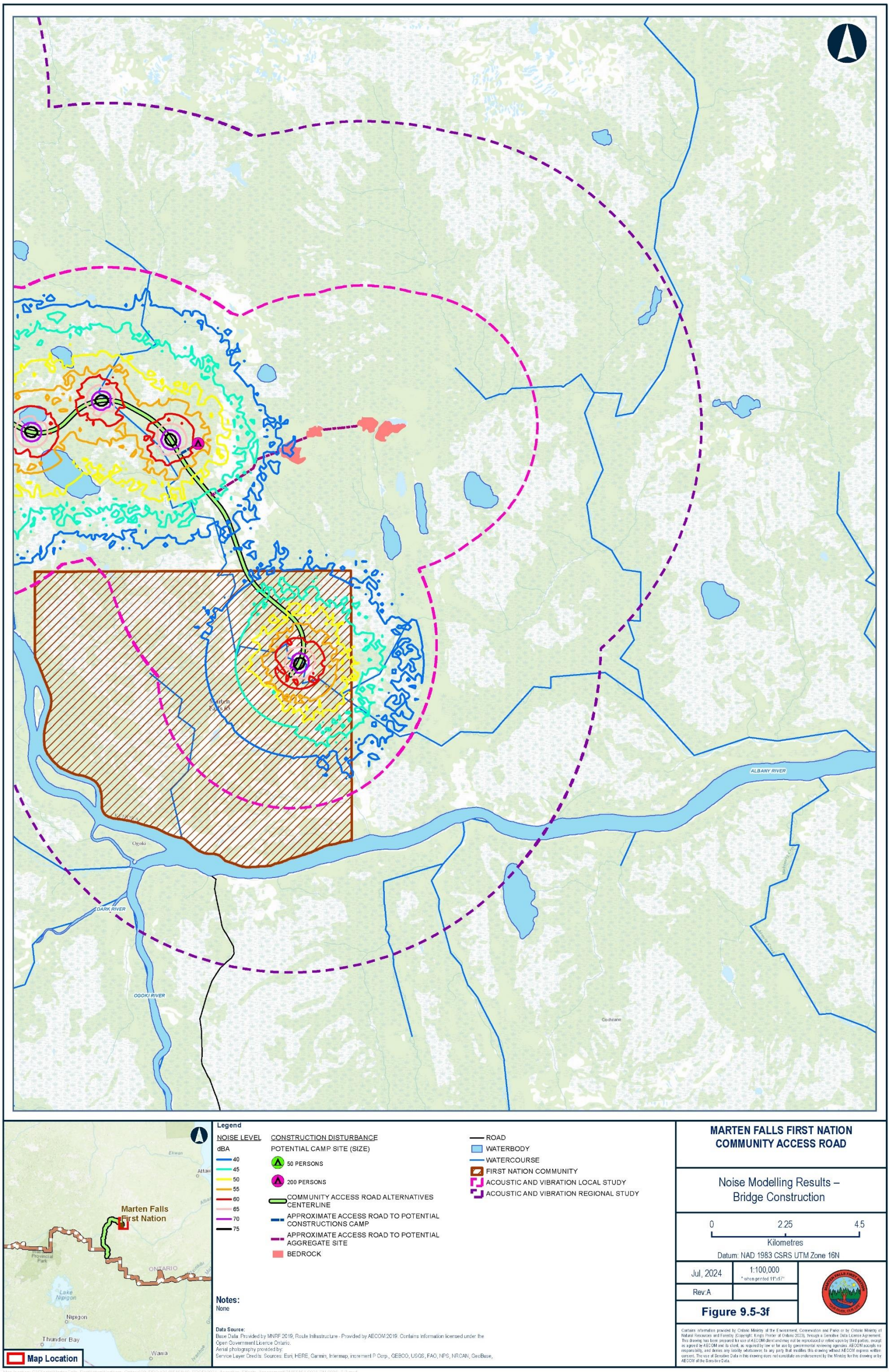


Figure 9.5-4: Noise Modelling Results – Pit and Quarry Use

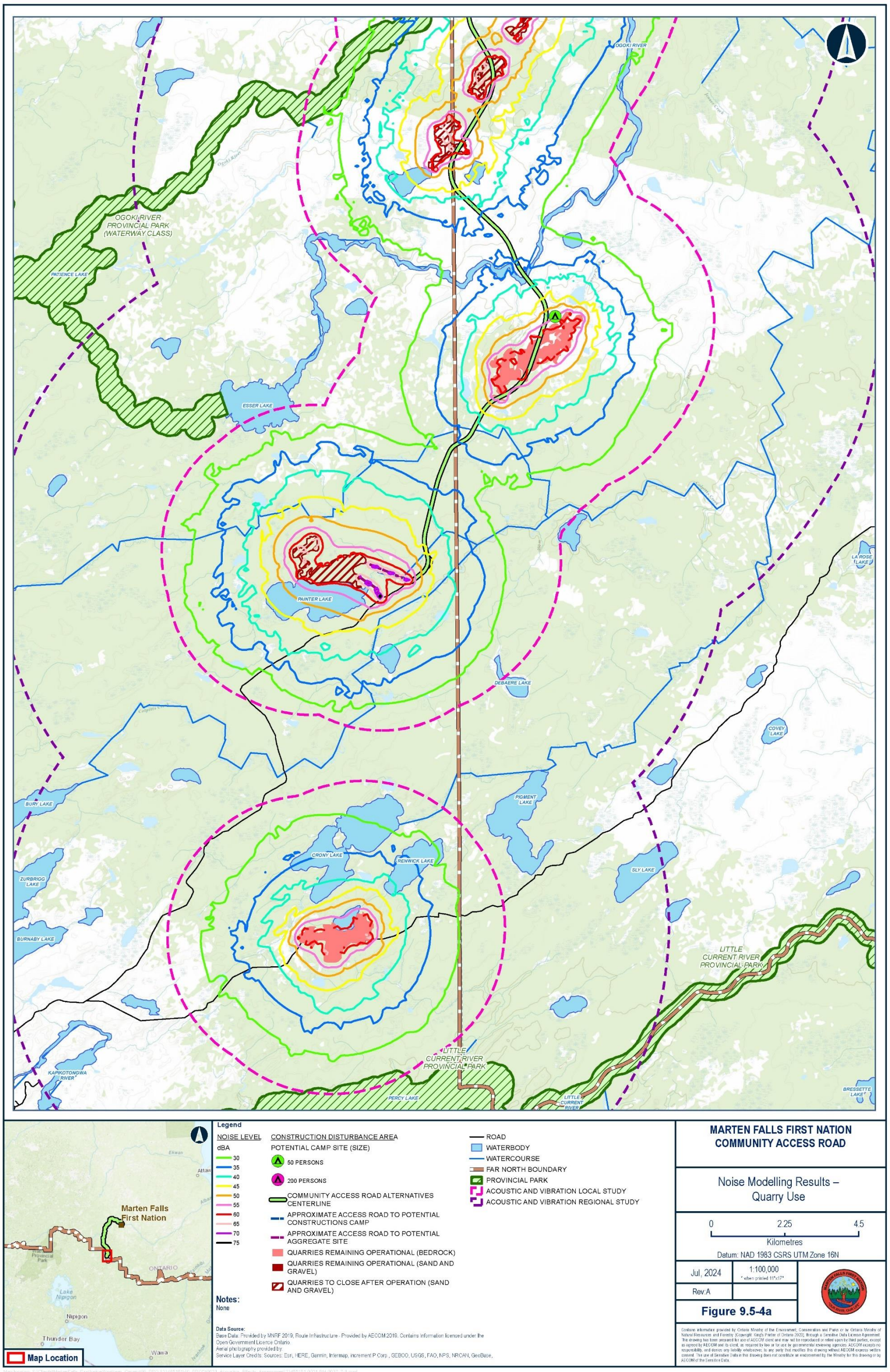


Figure 9.5-4b: Noise Modelling Results – Pit and Quarry Use

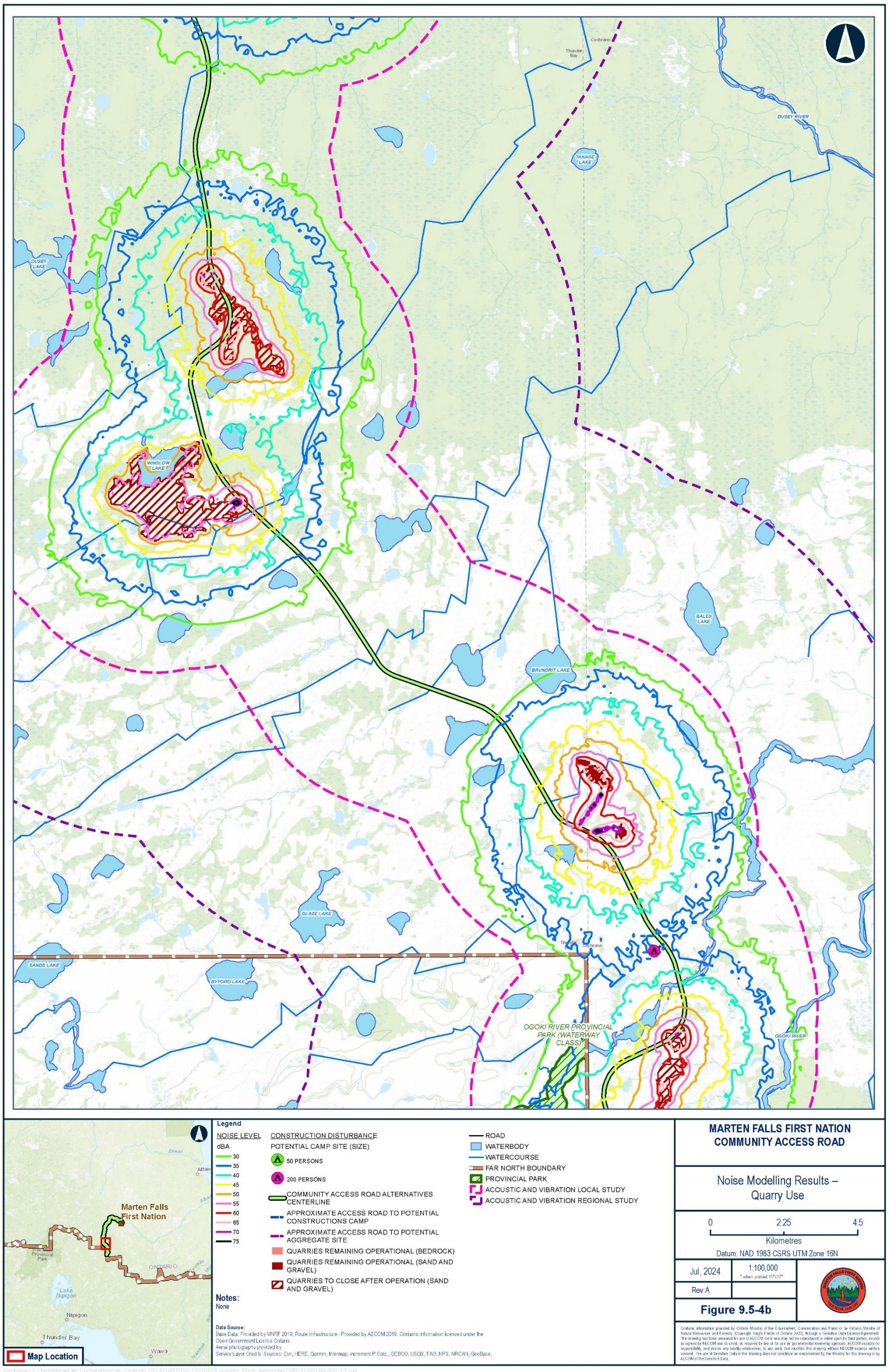


Figure 9.5-4c: Noise Modelling Results – Pit and Quarry Use

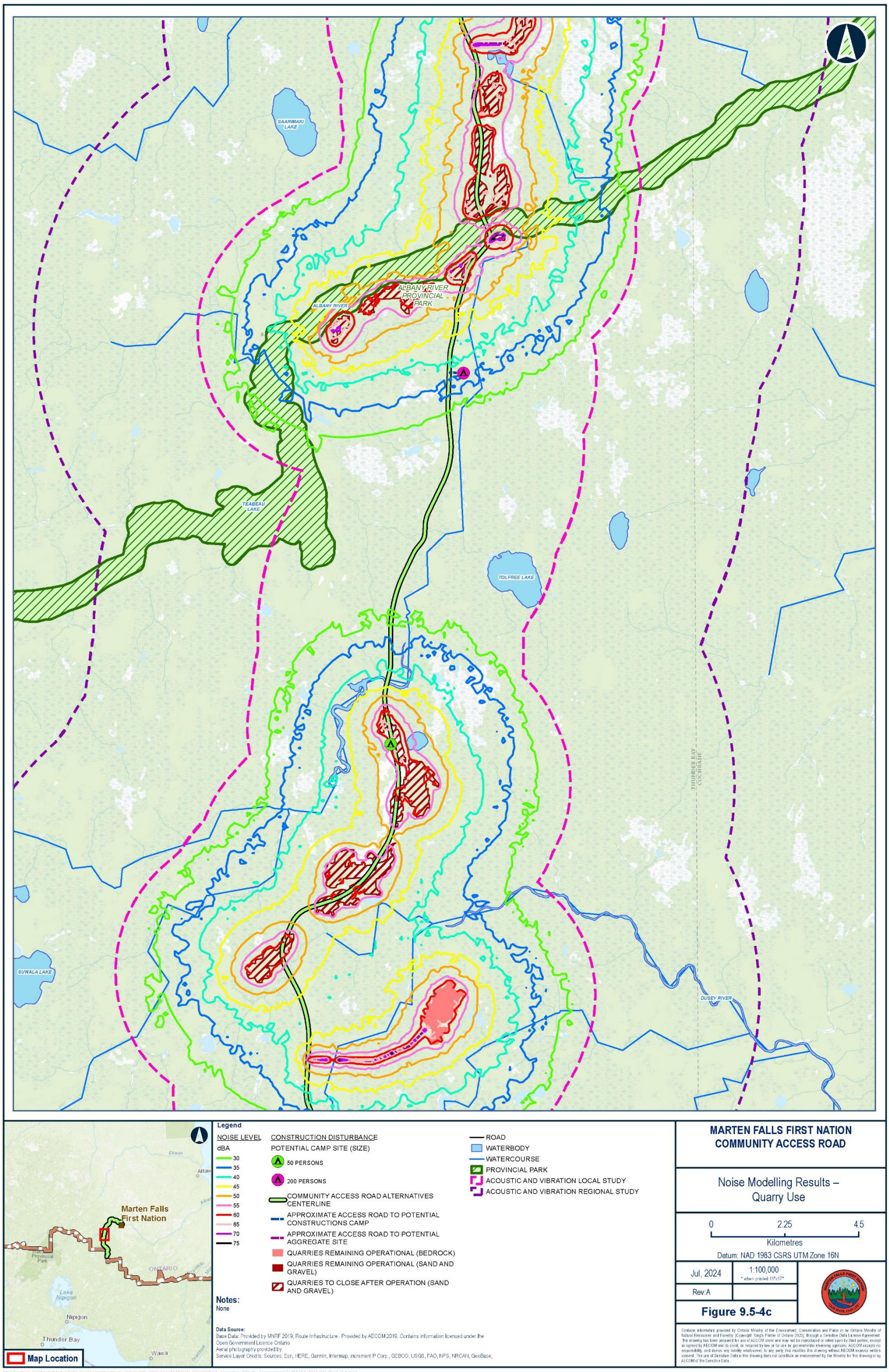


Figure 9.5-4d: Noise Modelling Results – Pit and Quarry Use

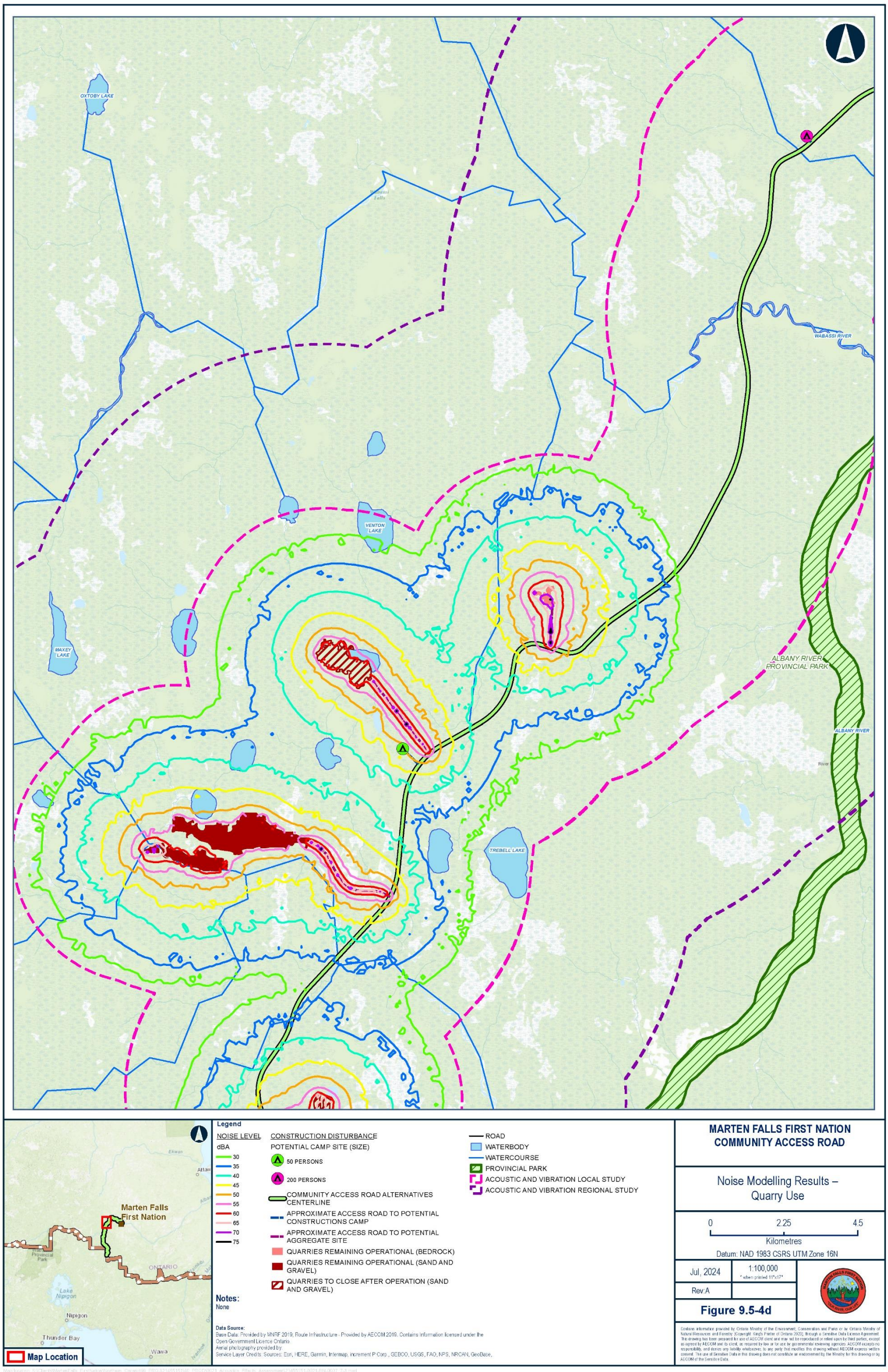


Figure 9.5-4e: Noise Modelling Results – Pit and Quarry Use

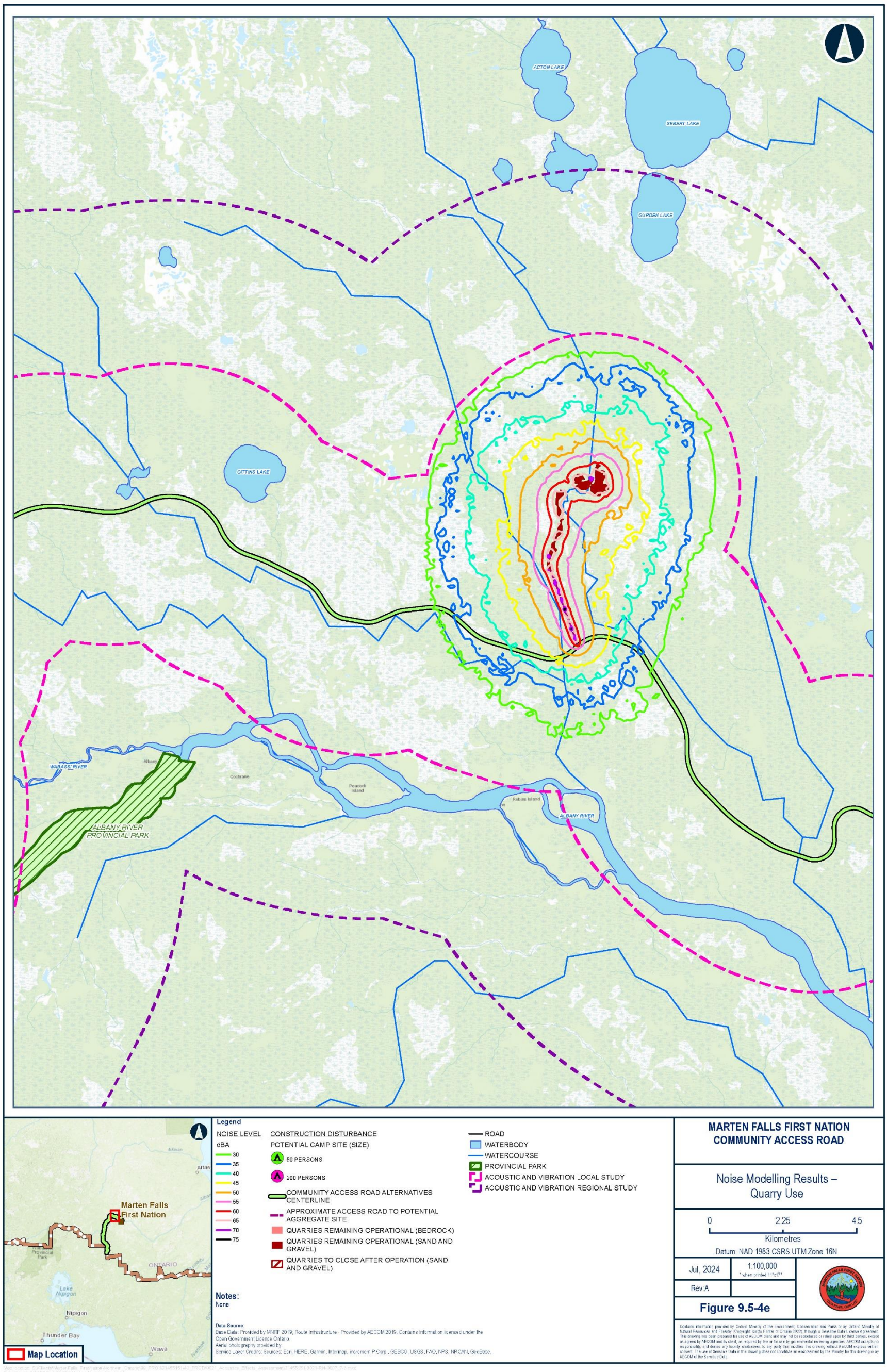
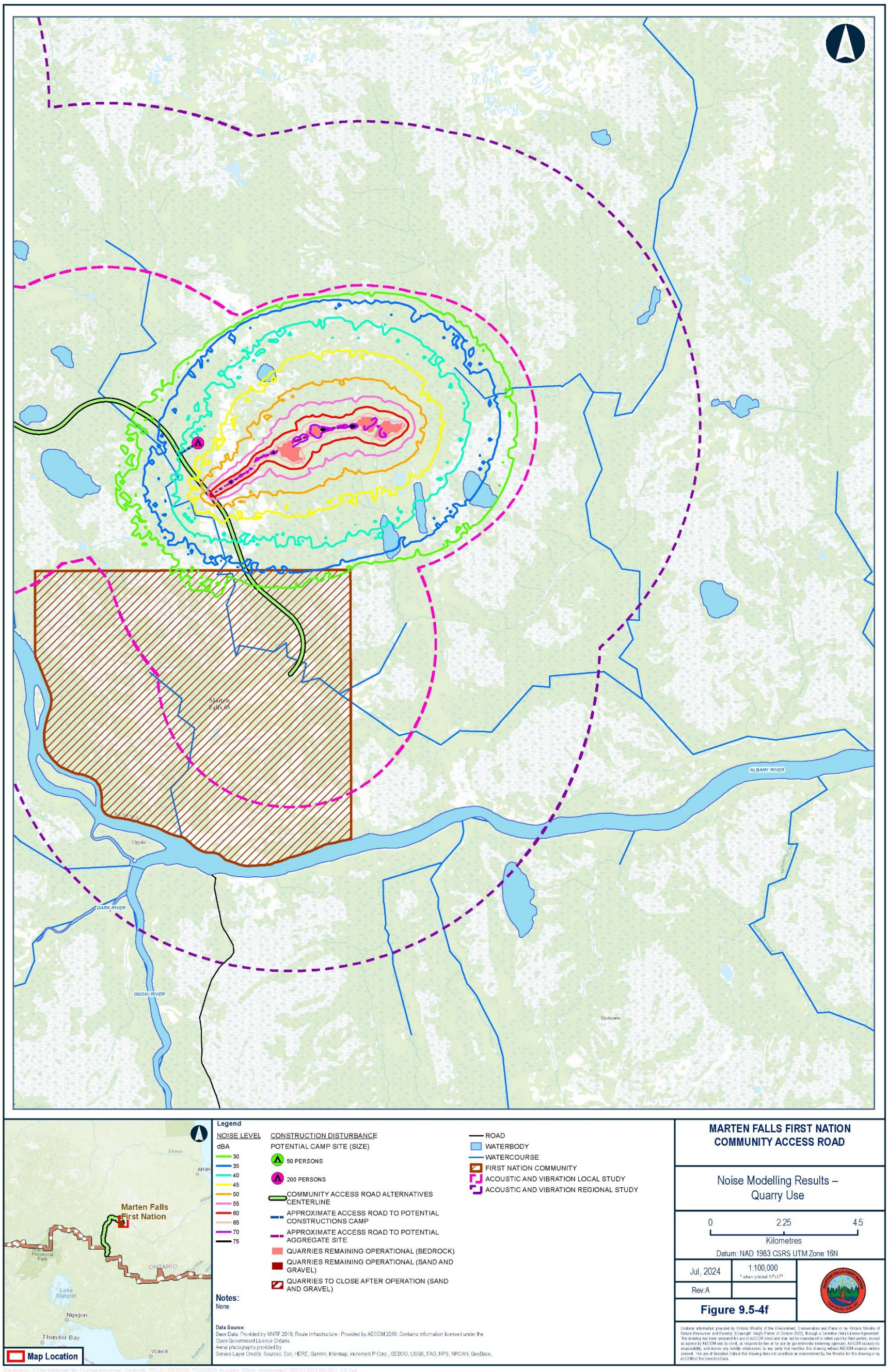


Figure 9.5-4f: Noise Modelling Results – Pit and Quarry Use



9.5.3.3.1.2 Mitigation and Enhancement Measures

The following is a general summary of the items to be considered relating to construction noise according to the Ontario Ministry of Transportation Noise Guide (Ontario Ministry of Transportation, 2022):

- Conduct construction activities, including quarry use, during the daytime period (in other words, 7 a.m. to 7 p.m.). Nighttime work is not anticipated. In the event construction will occur beyond the daytime period, applicable mitigation measures will be reviewed and implemented as required;
- Check that equipment and machinery used on site is maintained in good working conditions through regular maintenance and inspection;
- Design access roads to minimize reversing, which is expected to minimize use of backup beepers, where possible;
- Locate and operate construction equipment as far as possible from points of reception;
- Engage with Indigenous communities and relevant stakeholders to coordinate the planned construction schedule before the start of construction and prior to specific noisy activities to minimize overlap with the timing of traditional land use activities (for example, fall and spring hunting seasons);
- Where reasonable and practicable, turn off vehicles and equipment when idle, unless weather and / or safety conditions dictate the need for them to remain turned on and in a safe operating condition;
- Maintain the surface of the road such that rough surface conditions are avoided;
- Investigate noise concerns as they arise through a complaint resolution mechanism developed by the owner / operator whereby persons can contact the Project team if there are perceived noise issues; and
- Operate vehicles and equipment to minimize impulsive noise, where possible.

9.5.3.3.1.3 Predicted Residual Effects

Noise emissions during construction may result in a potential effect because it is predicted that, after the implementation of impact management measures, exceedances of applicable criteria at potential points of reception may occur. This potential effect is therefore carried through for further assessment in the following sections, including an assessment of significance.

9.5.3.3.2 Changes to Vibration Levels

9.5.3.3.2.1 Potential Effects

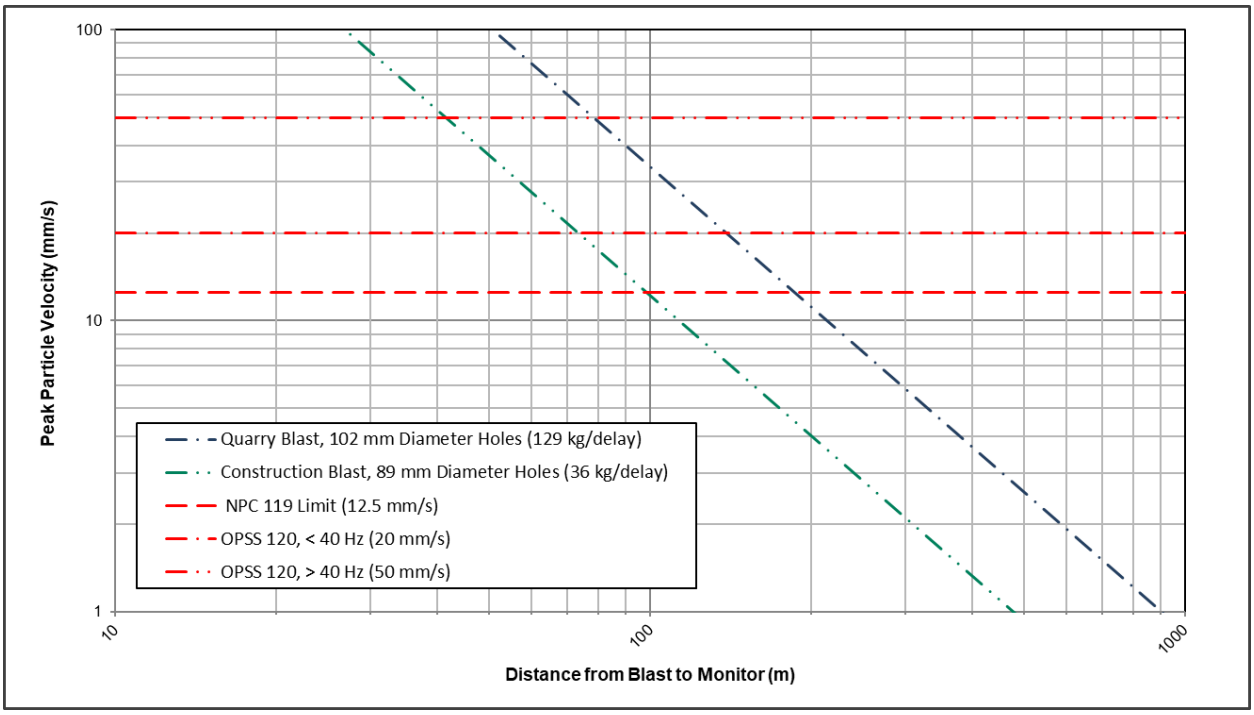
Blasting

Existing vibration levels can be expected to increase, on occasion, due to the construction blasting and quarry blasting activities at nearby points of reception, but blast-induced vibration is expected to be temporary in nature, occur only during specific activities, and limited to the vicinity of the Project footprint within the Study Area. The range in increased vibration levels associated with construction blasting will depend primarily on the maximum explosive weight detonated at any given instance and the proximity to the points of reception (in other words, the Project vibration levels in the environment generally decrease as the distance between the point of reception and maximum charge weight detonated at a given instance [in other words, delay period]).

Potential effects on vibration levels during blasting for construction will vary based on type of blasting, but for the Project, vibration effects are expected to be greatest during quarry blasting and when construction blasting is required near an existing point of reception.

A semi-quantitative assessment of the potential blasting during construction was carried out using the Ministry of the Environment, Conservation and Parks (1985) vibration attenuation model and the blast parameters described in **Appendix P**. It is assumed the blasting activities will occur near where aggregate materials are required and / or where the local bedrock profile require construction blasts to achieve the proper elevations. As the exact locations for the required blasting are not currently known, the results are presented as distance between the blast and the nearest sensitive receptor. When the blast locations are identified, the effect on specific vibration sensitive receptors can be estimated. The predictive vibration and air overpressure models developed for the proposed blasting methods are shown graphically in **Figure 9.5-5** and **Figure 9.5-6**, respectively. These are summarized in **Table 9.5-9** and **Table 9.5-10**.

Figure 9.5-5: Estimated Vibration Level with Distance from Receptor



Footnotes: mm/s = millimetre per second; mm = millimetre; kg/delay = kilogram per delay; < = less than; > = greater than; Hz = hertz; m = metre.

The estimated vibration levels shown in **Figure 9.5-5** are summarized in **Table 9.5-9**.

Table 9.5-9: Estimated Ground Vibrations for the Assessed Blast Design at a Range of Distances

Distance (Footnote a) (metres)	Peak Particle Velocity (Footnote b) (millimetre per second)	
	Quarry Blasts	Construction Blasts
100	33.9	12.2
200	11.2	4.0
300	5.8	2.1
400	3.7	1.3
500	2.6	0.9
600	1.9	0.7
700	1.5	0.5
800	1.2	0.4
900	1.0	0.4
1,000	0.9	0.3

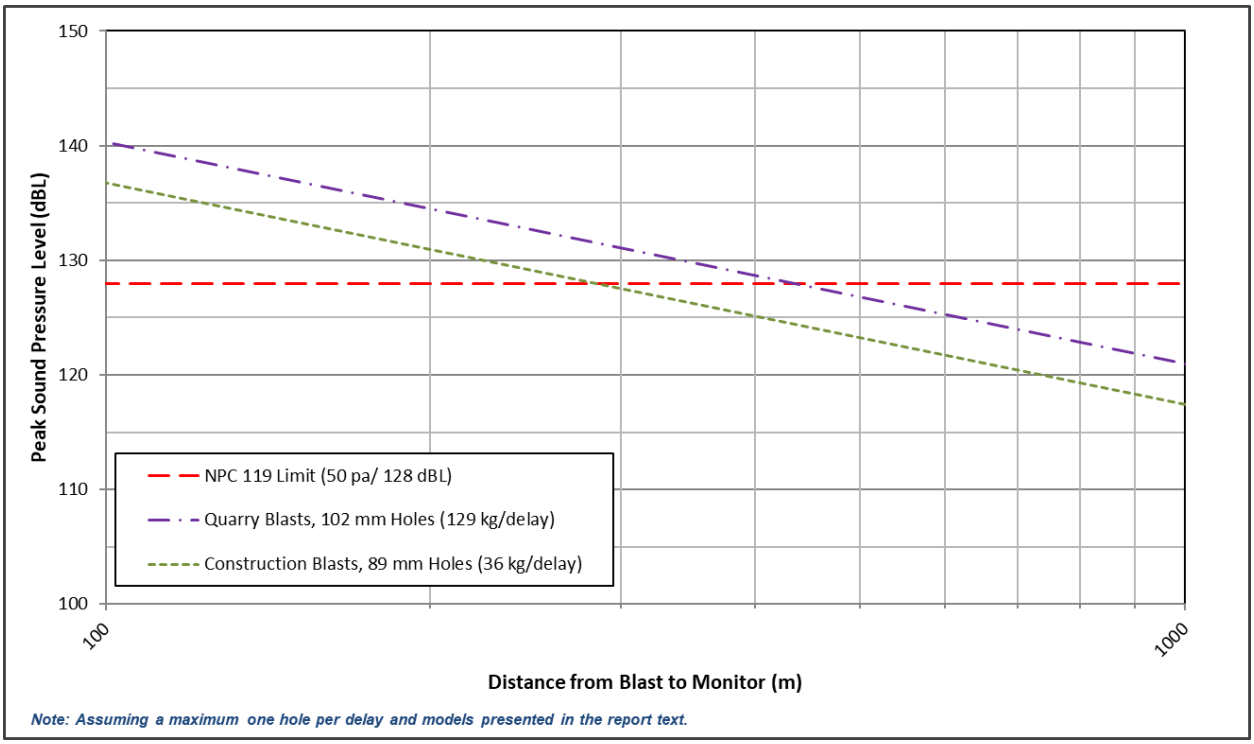
Footnotes: (a) Distance between the blast and the sensitive receptor.
(b) Assuming the attenuation models proposed previously.

Assuming a single hole per delay, the Ministry of the Environment, Conservation and Parks guideline limit of 12.5 millimetres per second may be complied with for all blasting beyond the following estimated standoff distances:

- Quarry blasts - 187 metres from the nearest receptor residence; and
- Construction blasts - 98 metres from the nearest receptor residence.

The estimated air overpressure levels are shown in **Figure 9.5-6** and summarized in **Table 9.5-10.**

Figure 9.5-6: Estimated Air Overpressure Level with Distance from Receptor



Footnotes: dBL = linear decibel; pa = pascal; mm = millimetre; kg/delay = kilogram per delay; m = metre.

Table 9.5-10: Estimated Ground Air Overpressure for the Proposed Blast Design at a Range of Distances

Distance (Footnote a) (metres)	Peak Sound Pressure Level (Footnote b) (linear decibel)	
	Quarry Blasts	Construction Blasts
75	143	139
100	140	137
200	135	131
300	131	128

Distance (Footnote a) (metres)	Peak Sound Pressure Level (Footnote b) (linear decibel)	
	Quarry Blasts	Construction Blasts
400	129	125
500	127	123
600	125	122
700	124	120
800	123	119
900	122	118
1000	121	117

Footnotes: (a) Distance between the blast and the sensitive receptor.
(b) Assuming the attenuation models proposed.

Assuming a single hole per delay, the Ministry of the Environment, Conservation and Parks guideline limit of 128 dBL may be complied with for all blasting measured in front of the face beyond the following estimated standoff distances from adjacent receptor locations:

- Quarry blasts – 430 metres; and
- Construction blasts – 300 metres.

Assuming a single hole per delay, the Health Canada guideline limit of 125 dBL for a single blast per day may be complied with for all blasting measured in front the face beyond the following estimated standoff distances from adjacent receptor locations:

- Quarry blasts – 600 metres; and
- Construction blasts – 400 metres.

The estimated standoff distances do not consider the effect of vegetation (for example, trees) and local topography on the air vibration levels. If the construction blasts require the use of blast mats to control flyrock (in other words, ejected rock fragments and debris) the air overpressure will be reduced significantly.

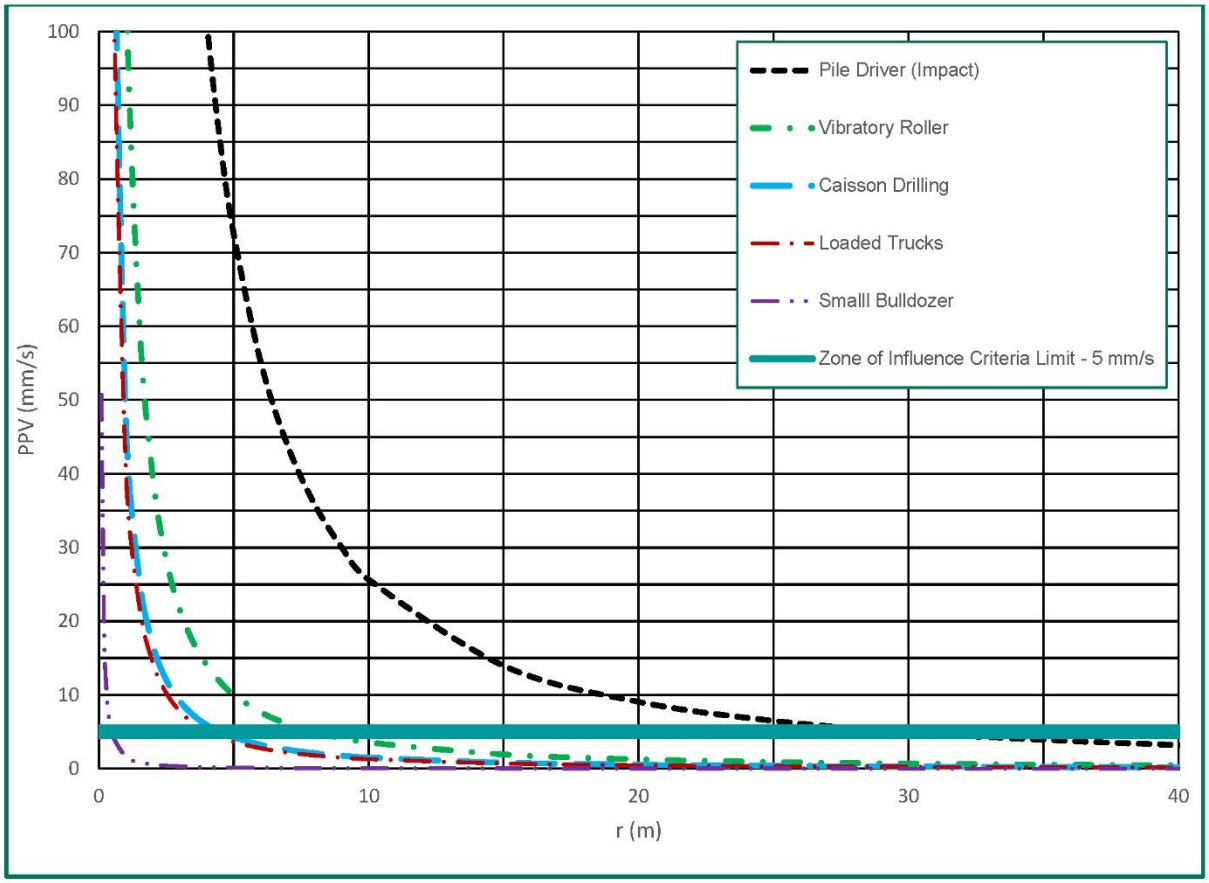
General Construction Activities

Existing vibration levels can be expected to increase, on occasion, due to the general construction activities at nearby points of reception, but general construction vibration is expected to be temporary in nature, occur only during specific activities, and limited to the vicinity of the Project footprint within the Study Area. The range in increased vibration levels associated with general construction activities will depend primarily on the number and type of vibration sources and their proximity to the points of reception (in other words, the Project vibration levels in the environment generally decrease as the distance between the point of reception and construction activities increase). Potential effects on vibration levels during construction will vary based on type of

general construction activities, but for the Project, vibration effects are expected to be greatest during impact pile driving.

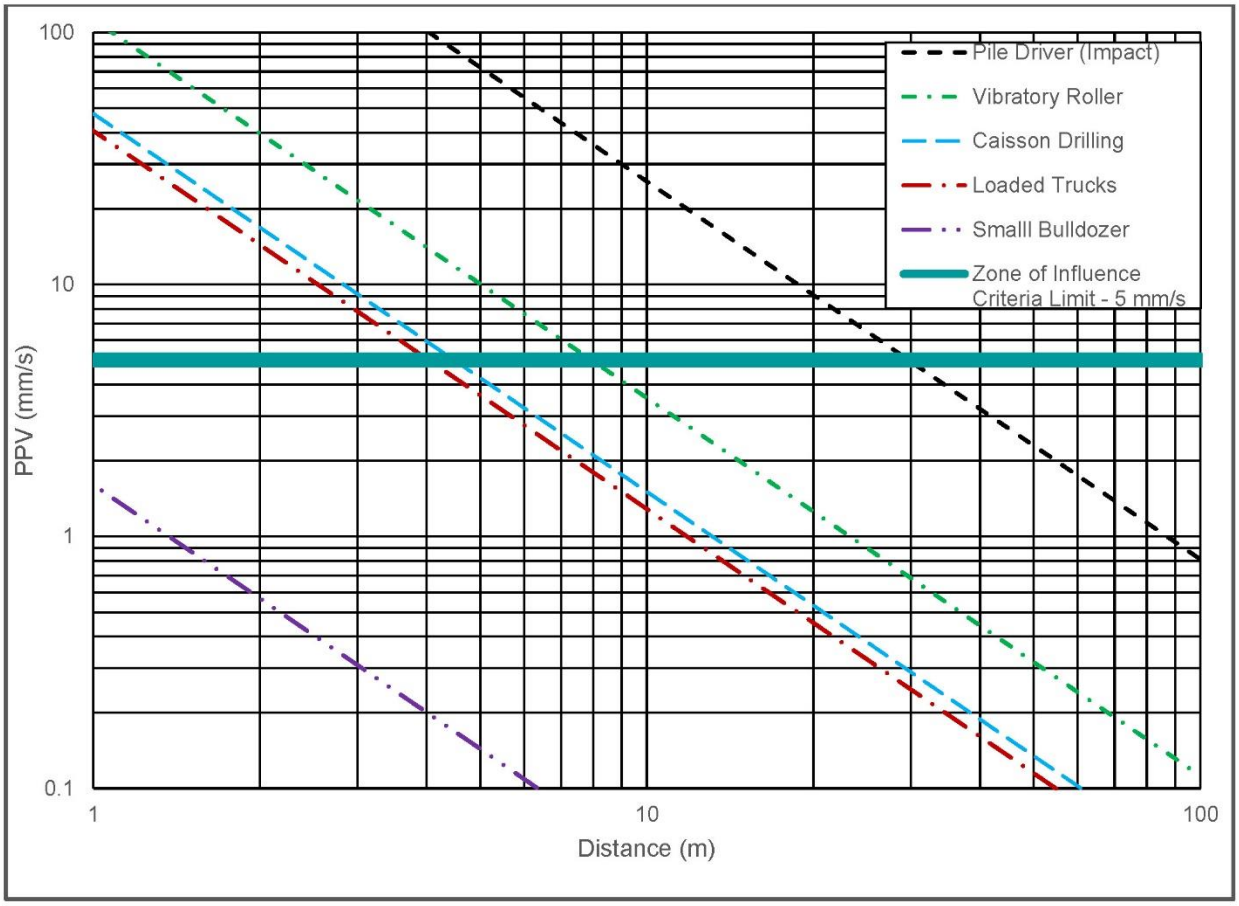
The assessment of the Project's general construction activities was carried out using the Transit Noise and Vibration Impact Assessment Manual vibration attenuation model. Select pieces of construction equipment were selected to present a range in potential vibration levels due to the Project general construction activities. It is assumed the general construction activities will occur anywhere within the Project right-of-way; therefore, the predicted zone of influence was considered to begin at the edge of the cleared section of the Project right-of-way (in other words, 30 metres from the Community Access Road centreline), unless otherwise stated below. The predictive vibration models developed for various proposed selected construction equipment and the zone of influence levels are shown graphically in linear and logarithmic scales in **Figure 9.5-7** and **Figure 9.5-8**, respectively.

Figure 9.5-7: Ground Vibration Attenuation Model for Various Proposed General Construction Activities – Linear Scale



Footnote: PPV = peak particle velocity; ZOI = zone of influence; mm/s = millimetre per second.

Figure 9.5-8: Ground Attenuation Model for Various Proposed General Construction Activities – Logarithmic Scale



Footnote: PPV = peak particle velocity; ZOI = zone of influence; mm/s = millimetre per second.

The City of Toronto Bylaw 514-2008 preliminary zone of influence criteria (in other words, 5 millimetres per second) for building damage may exist for some general construction equipment, which are expected to be the greatest source of vibrations, within the following estimated standoff distances:

- Impact pile driving – 30 metres from impact pile driving location. It is assumed any impact pile driving would occur within the edges of the road, therefore approximately 6 metres from the Community Access Road centreline (in other words, edge of road width);
  - Vibratory Roller – 8 metres from the cleared section of the Project right-of-way; and
  - Caisson Drilling – 5 metres from the cleared section of the Project right-of-way.

The Transit Noise and Vibration Impact Assessment Manual guideline limit of 0.1 millimetres per second for human annoyance may be complied with for some general construction equipment, which are expected to be the greatest source of vibration, beyond the following estimated standoff distances:

- Impact pile driving – 175 metres from impact pile driving location. It is assumed any impact pile driving would occur within the edges of the road, therefore approximately 6 metres from the Community Access Road centreline (such as, edge of road width);
  - Vibratory Roller – 50 metres from the cleared section of the Project right-of-way; and
  - Caisson Drilling – 25 metres from the cleared section of the Project right-of-way.

Based on the results of the vibration attenuation model, the predicted preliminary zone of influence (in other words, 5 millimetres per second) for building damage is within the right-of-way. Therefore, for the purposes of this assessment, a frequency-dependent analysis was not carried out for building damage.

Based on the results of the vibration attenuation model, the predicted general construction activities vibration levels at some of the identified representative points of reception exceed the human annoyance criteria considered for this vibration assessment. For the purposes of this assessment, a frequency-dependent analysis was not carried out for human annoyance. Therefore, potential vibration effects are expected during Project Construction at some of the points of reception and a detailed vibration assessment, including a frequency-dependent analysis, mitigation assessment as required and a monitoring program, is recommended to be carried out during detail design.

9.5.3.3.2.2 Mitigation and Enhancement Measures

The construction phase of any project is typically considered temporary or short term relative to the entire life cycle of a project. The following is a general summary of the items to be considered relating to construction vibration according to the various guidance documents and experience on similar projects.

As potential construction vibration effects are expected at some of the points of reception in the vicinity of the Project, the following are general recommendations to assist in minimizing vibration effects due to the Project's construction activities:

- Develop a Construction Vibration Workplan prior to the start of construction describing the construction schedule, list of construction equipment, list of point of reception locations (in other words, traditional land use, residential, heritage structures and utilities), applicable guidance documents including criteria and control measures;

- Consider the use of frequency-dependent vibration limits as more detailed information regarding the construction activities is known;
- Engage with Indigenous communities and relevant stakeholders to coordinate the planned construction schedule before the start of construction and prior to specific activities that may generate vibration to minimize overlap with the timing of traditional land use activities (for example, fall and spring hunting seasons);
- Investigate vibration concerns as they arise through a complaint resolution mechanism whereby persons can contact the Project team if there are perceived vibration issues;
- Conduct construction activities during the daytime period (such as, 7 a.m. to 7 p.m.). Nighttime work is not anticipated. In the event construction will occur beyond the daytime period, applicable mitigation measures will be reviewed and implemented as required;
- Locate and operate construction equipment as far as possible from points of reception;
- Maintain the surface of the road such that rough surface conditions are avoided;
- Avoid operating equipment that is expected to generate significant vibrations at the same time. Operating them separately may reduce overall vibration levels;
- Construction blasting will be carried out in compliance with the Ontario Provincial Standard Specification 120 and NPC-119. The Ontario Provincial Standard Specification 120 details items such as vibration limits, protective measures, pre-blast surveys and notification to nearby owners and tenants. All blasts which might impact local structures or disrupt humans will be monitored for ground and air vibrations;
- Blasting at temporary or existing quarries will be carried out to comply with the conditions provided in the licence or aggregate permit, if a licence or aggregate permit exists or is required; and
- Blasting delays and blast mats will be used, as appropriate, to control vibration and fly rock as required.

9.5.3.3.2.3 Predicted Residual Effects

Vibration during construction may result in a potential effect because it is predicted that, after the implementation of impact management measures, exceedances of applicable criteria at potential points of reception may occur. This potential effect is therefore carried through for further assessment in the following sections, including an assessment of significance.

9.5.3.4 Residual Effects – Operations Phase

9.5.3.4.1 Changes to Noise Levels

9.5.3.4.1.1 Potential Effects

Noise levels can be expected to increase during operations due to road traffic and maintenance activities. Noise levels due to maintenance activities at the potential points of reception are expected to be similar to (or lower than) construction noise levels, temporary in nature and localized within the Local Study Area. Therefore, noise levels due to maintenance during Operations are bounded by those assessed for Project Construction and are not further assessed.

Table 9.5-11 and **Figure 9.5-9** and **Figure 9.5-10** present the predicted noise levels from road traffic during Project operations at the potential points of reception. **Table 9.5-12** presents the predicted noise levels from the pit and quarry operations at those locations which will operate during Project operations (**Figure 9.5-4**). The following tables also indicate the applicable noise limit for each parameter and indicates where noise levels exceed these limits in bold / underline. Note, the criteria related to the nighttime L_{max} to address potential sleep disturbance was not further assessed as the road traffic noise prediction algorithm does not predict this parameter. For the purposes of this assessment, sleep disturbance was assessed considering the Health Canada criteria L_n.

The range in increased noise levels associated with operations will depend primarily on the distance from the Community Access Road or pit and quarry to the points of reception (in other words, the Project noise levels in the environment generally decrease as the distance between the points of reception and noise sources increases).

The results in **Table 9.5-11** and **Figure 9.5-9** and **Figure 9.5-10** indicate that for the operation of the Community Access Road, predicted noise levels were below applicable thresholds.

The results in **Table 9.5-12** indicate that for the operation of pits and quarries, at one point of reception where habitation may occur (in other words, a potential receptor as defined by NPC-300), the predicted daytime noise level of 46 A-weighted decibels exceeds the NPC-300 daytime sound level limit of 45 A-weighted decibels by 1 A-weighted decibels. The results also indicate that at points of reception within 100 metres of the effects assessment Construction Disturbance Area surrounding pits and quarries that are active during Project operations, predicted daytime noise levels exceed the Health Canada criteria of 55 A-weighted decibels for good speech comprehension. Note that no potential habitation locations were identified within 100 metres of the effects assessment Construction Disturbance Area.

Table 9.5-11: Summary of Predicted Noise Levels at Points of Reception During Operation – Road Use

Distances from the Construction Disturbance Area	Number of Potential Points of Reception – No Habitation Expected (Footnote a)	Number of Potential Points of Reception – Habitation May Occur (Footnote b)	Project Daytime (Footnote c) Noise Level (dBA)	Project Nighttime (Footnote c) Noise Level (dBA) (Footnote d)	Existing + Project Daytime (Footnote c) Noise Level (dBA)	Existing + Project Nighttime (Footnote c) Noise Level (dBA) (Footnote d)	Existing + Project Day-Night Noise Level (dBA) (Footnote d)	Change in Percent Highly Annoyed (percent) (Footnote d)
Applicable Noise Limit	Not applicable	Not applicable	55 (Footnote e)	Not applicable	55 (Footnote f)	40 (Footnote f)	55 (Footnote f)	6.5 (Footnote f)
Edge of Construction Disturbance Area[a]	77	0	38 to 53	Not applicable	41 to 53	Not applicable	Not applicable	Not applicable
Construction Disturbance Area to 100 m	1	0	49	Not applicable	49	Not applicable	Not applicable	Not applicable
100 to 200 m	10	2	27 to 47	22 to 26	38 to 48	33 to 34	41	0.1 to 0.3
200 to 300 m	5	0	20 to 44	Not applicable	38 to 45	Not applicable	Not applicable	Not applicable
300 to 400 m	7	3	37 to 41	33 to 35	41 to 43	36 to 37	43 to 45	1.0 to 1.5
400 to 500 m	6	1	21 to 38	34	38 to 41	37	44	1.3
500 to 600 m	11	2	21 to 38	16	38 to 41	33	41	0.0
600 to 1,000 m	17	8	5 to 35	0 to 30	38 to 40	33 to 35	41 to 42	0.0 to 0.6
1,000 to edge of Local Study Area	103	48	0 to 31	0 to 26	38 to 39	33 to 34	41	0.0 to 0.3

Footnotes: (a) Land uses where habitation (in other words, sleep) is not expected to occur included recreation, animal, fish and plant harvest, and cultural, spiritual, and sacred.
(b) Locations where habitation may occur included outfitter camps and locations identified as habitation through Indigenous Knowledge.
(c) Daytime is defined as 7 a.m. to 11 p.m. and nighttime is defined as 11 p.m. to 7 a.m.
(d) Nighttime and day-night noise level and percent highly annoyed criteria are only applicable for points of reception where habitation may occur.
(e) Source: Ministry of Environment / Ministry of Transportation Noise Protocol (Ministry of Environment / Ministry of Transportation 1986).
(f) Source: Health Canada Noise Guidance (Health Canada, 2023).

Table 9.5-12: Summary of Predicted Noise Levels at Points of Reception During Pit and Quarry Operations

Distances from the Construction Disturbance Area	Number of Potential Points of Reception – No Habitation Expected (Footnote a)	Number of Potential Points of Reception – Habitation May Occur (Footnote b)	Project Daytime (Footnote c) Noise Level (dBA)	Project Daytime (Footnote c) Noise Level (dBA) at Points of Reception – Habitation May Occur	Existing + Project Daytime (Footnote c) Noise Level (dBA)	Existing + Project Day-Nigh Noise Level (dBA) (Footnote d),(Footnote e)	Change in Percent Highly Annoyed (percent) (Footnote d)
Applicable Noise Limit	Not applicable	Not applicable	Not applicable	45 (Footnote f)	55 (Footnote g)	55 (Footnote g)	6.5 (Footnote g)
Edge of Construction Disturbance Area[a]	11	0	55 to 77	Not applicable	**55 to 77**	Not applicable	Not applicable
Construction Disturbance Area to 100 m	7	0	60 to 64	Not applicable	**60 to 64**	Not applicable	Not applicable
100 to 200 m	1	0	55	Not applicable	55	Not applicable	Not applicable
200 to 300 m	0	0	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
300 to 400 m	2	0	51 to 53	Not applicable	51 to 53	Not applicable	Not applicable
400 to 500 m	0	0	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
500 to 600 m	3	1	45 to 54	**46**	46 to 54	46	2.1
600 to 1,000 m	4	1	42 to 52	44	43 to 52	44	1.5
1,000 to edge of Local Study Area	47	4	10 to 46	10 to 30	38 to 47	41 to 41	0.0 to 0.1

Footnotes: **Bold** indicates exceedance of applicable noise limit
(a) Land uses where habitation (in other words, sleep) is not expected to occur included recreation, animal, fish and plant harvest, and cultural, spiritual, and sacred.
(b) Locations where habitation may occur included outfitter camps and locations identified as habitation through Indigenous Knowledge.
(c) Daytime is defined as 7 a.m. to 10 p.m.
(d) Day-night noise level and percent highly annoyed criteria are only applicable for points of reception where habitation may occur.
(e) As quarry operations are expected to occur during the daytime only, the existing nighttime noise level of 33 A-weighted decibels was used to calculate the day-night noise level.
(f) Source: NPC-300 (Ministry of the Environment, Conservation and Parks, 2013).
(g) Source: Health Canada Noise Guidance (Health Canada, 2023).

Figure 9.5-9: Noise Modelling Results – Daytime Road Operations

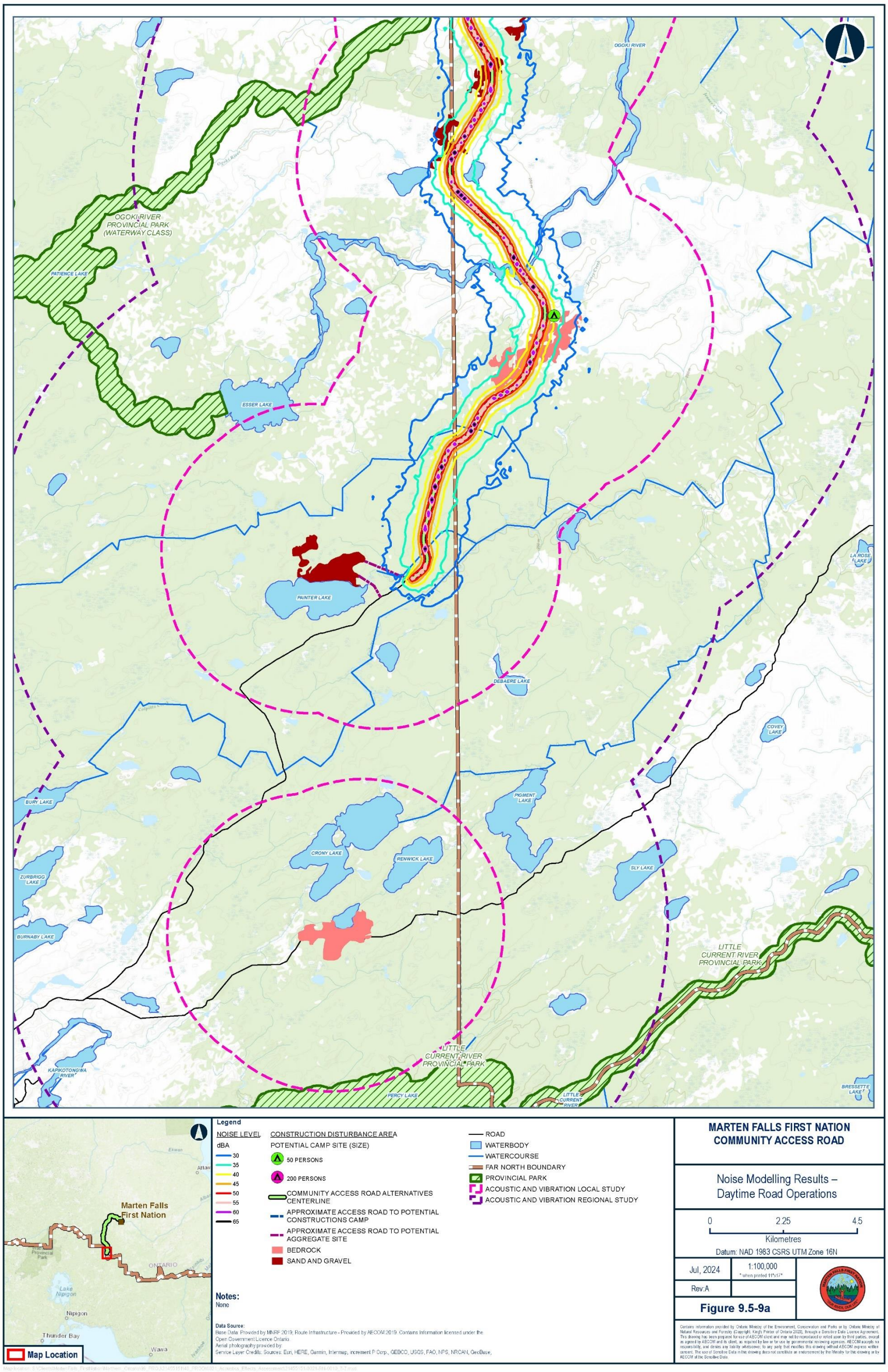


Figure 9.5-9b: Noise Modelling Results – Daytime Road Operations

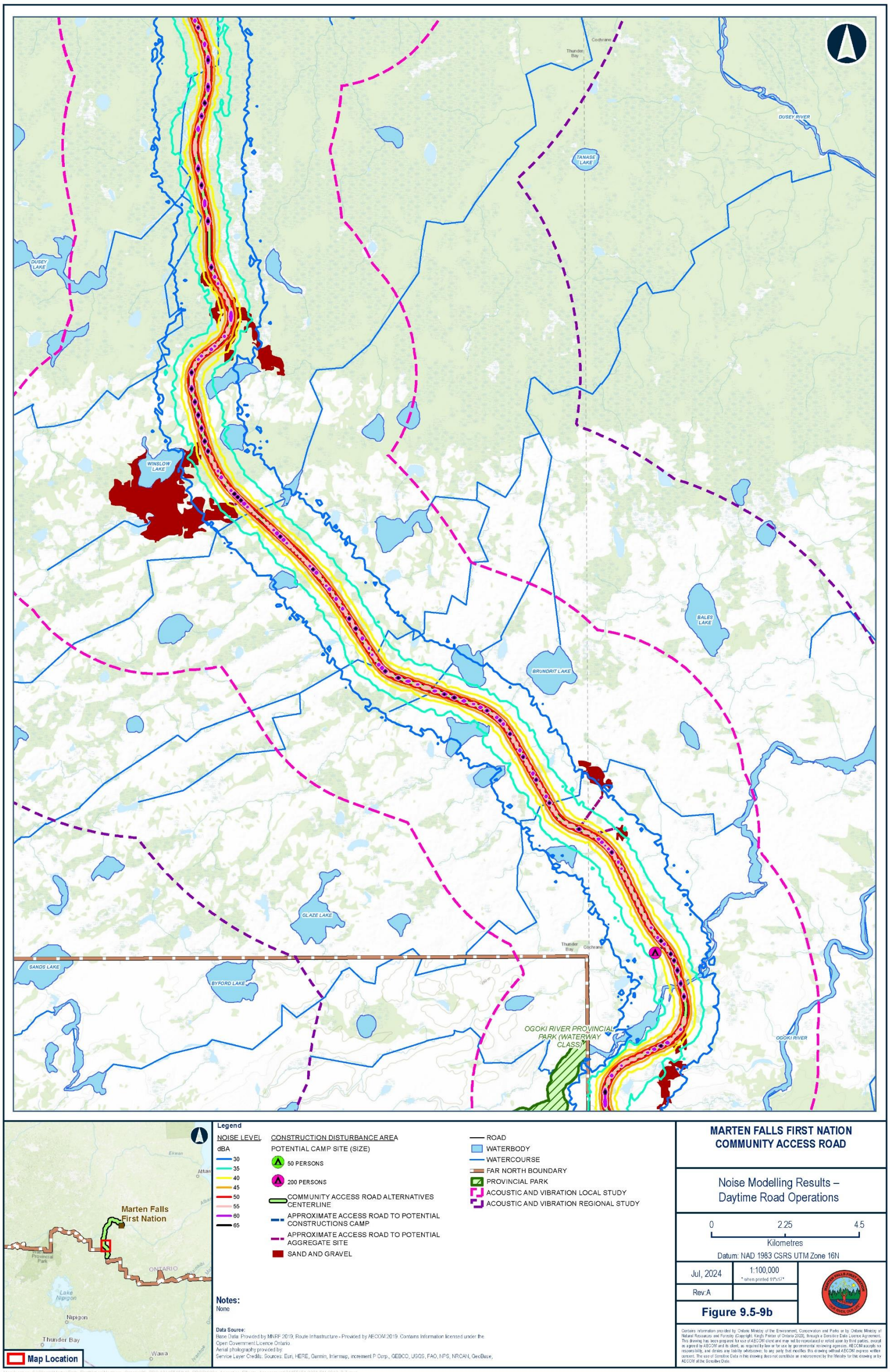


Figure 9.5-9c: Noise Modelling Results – Daytime Road Operations

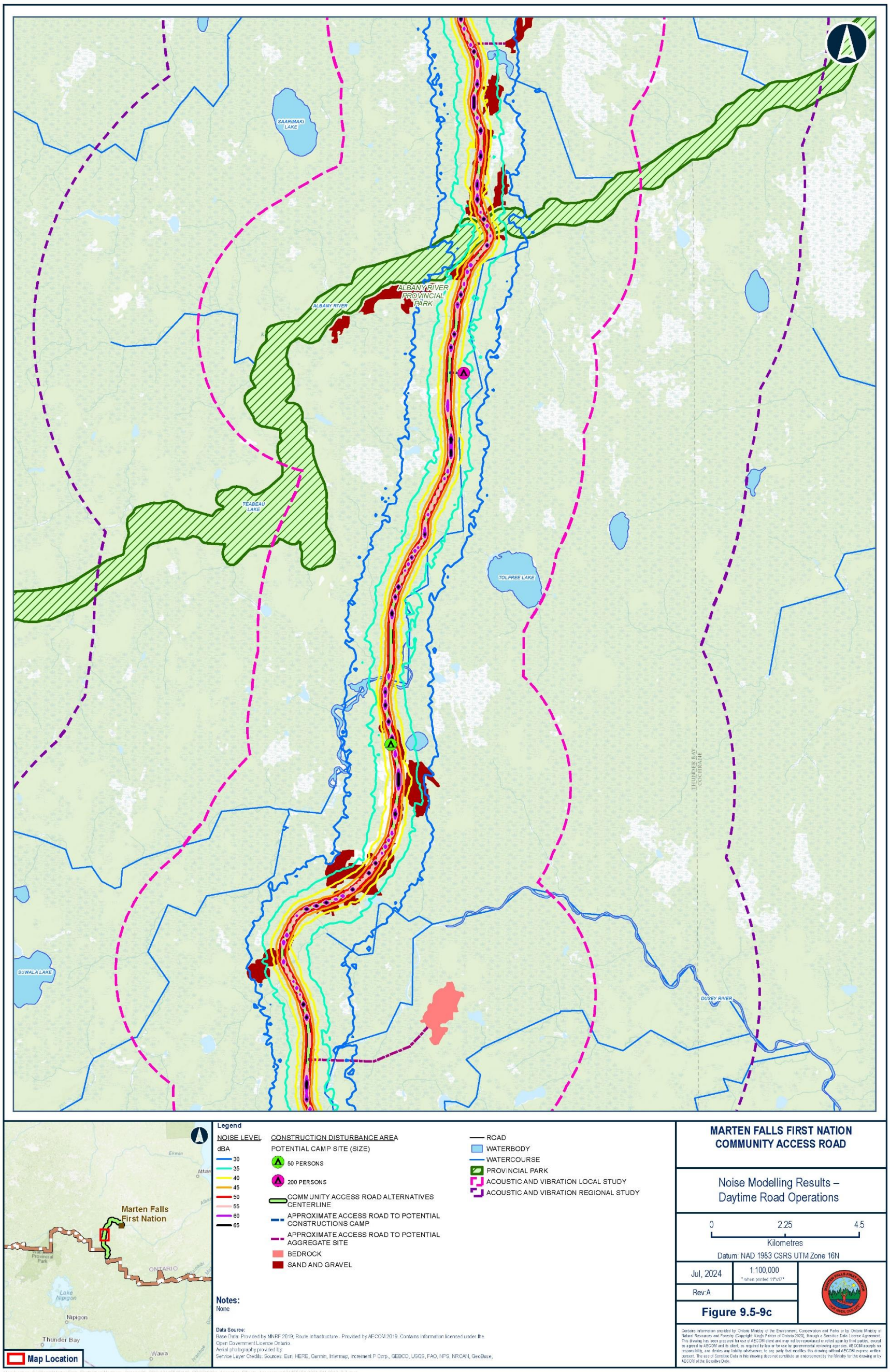


Figure 9.5-9d: Noise Modelling Results – Daytime Road Operations

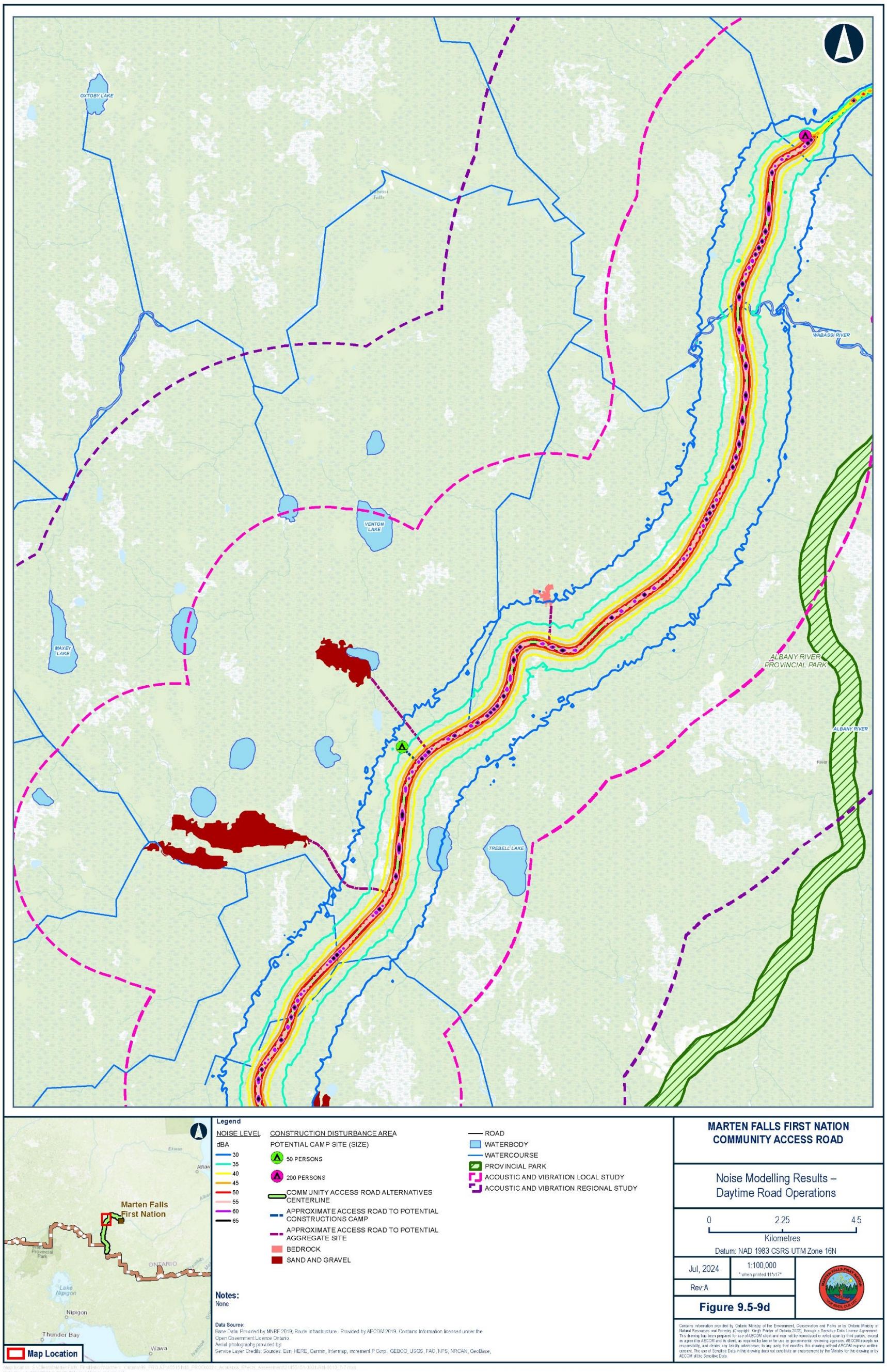


Figure 9.5-9e: Noise Modelling Results – Daytime Road Operations

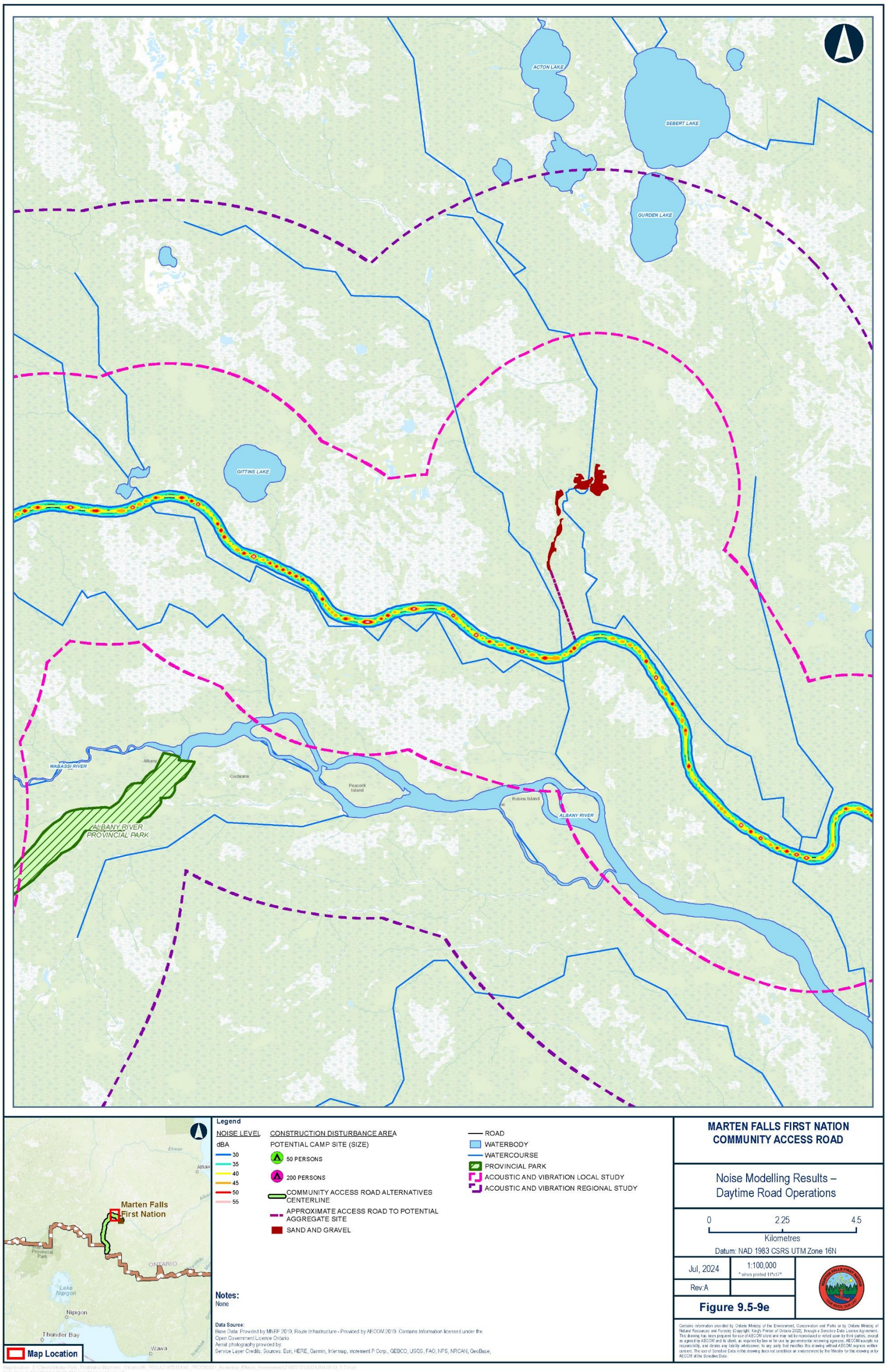


Figure 9.5-9f: Noise Modelling Results – Daytime Road Operations

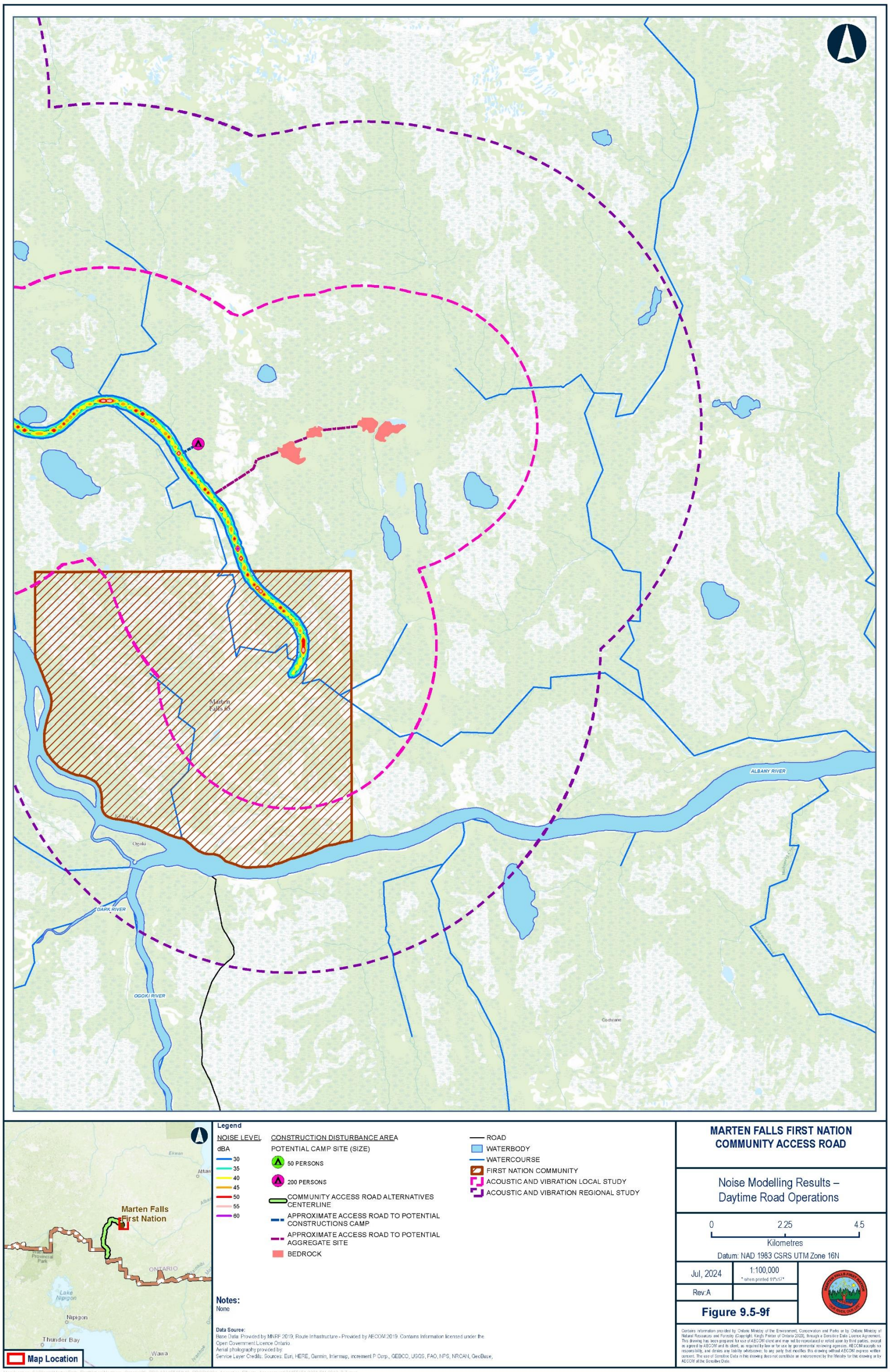


Figure 9.5-10: Noise Modelling Results – Nighttime Road Operations

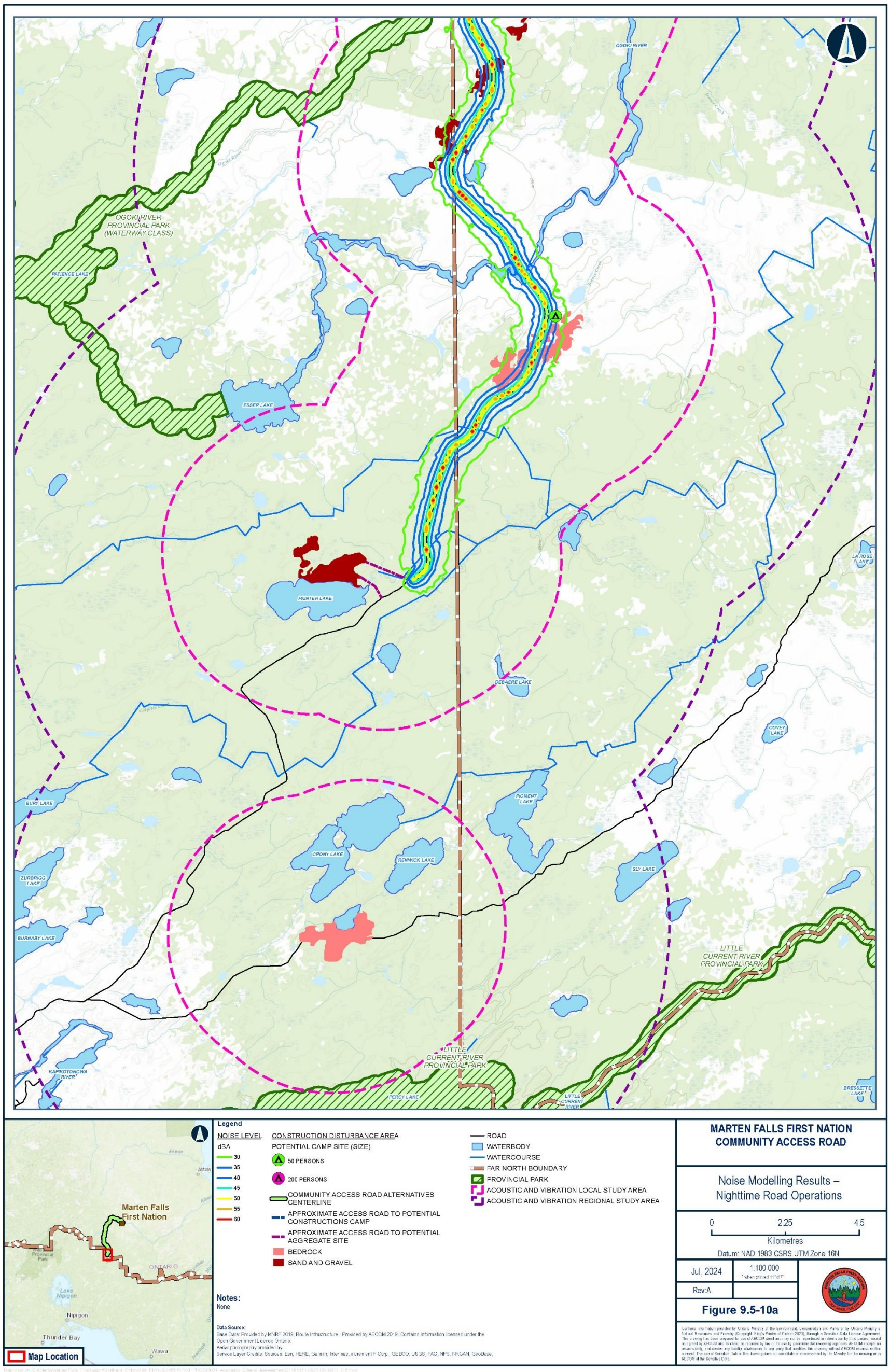


Figure 9.5-10b: Noise Modelling Results – Nighttime Road Operations

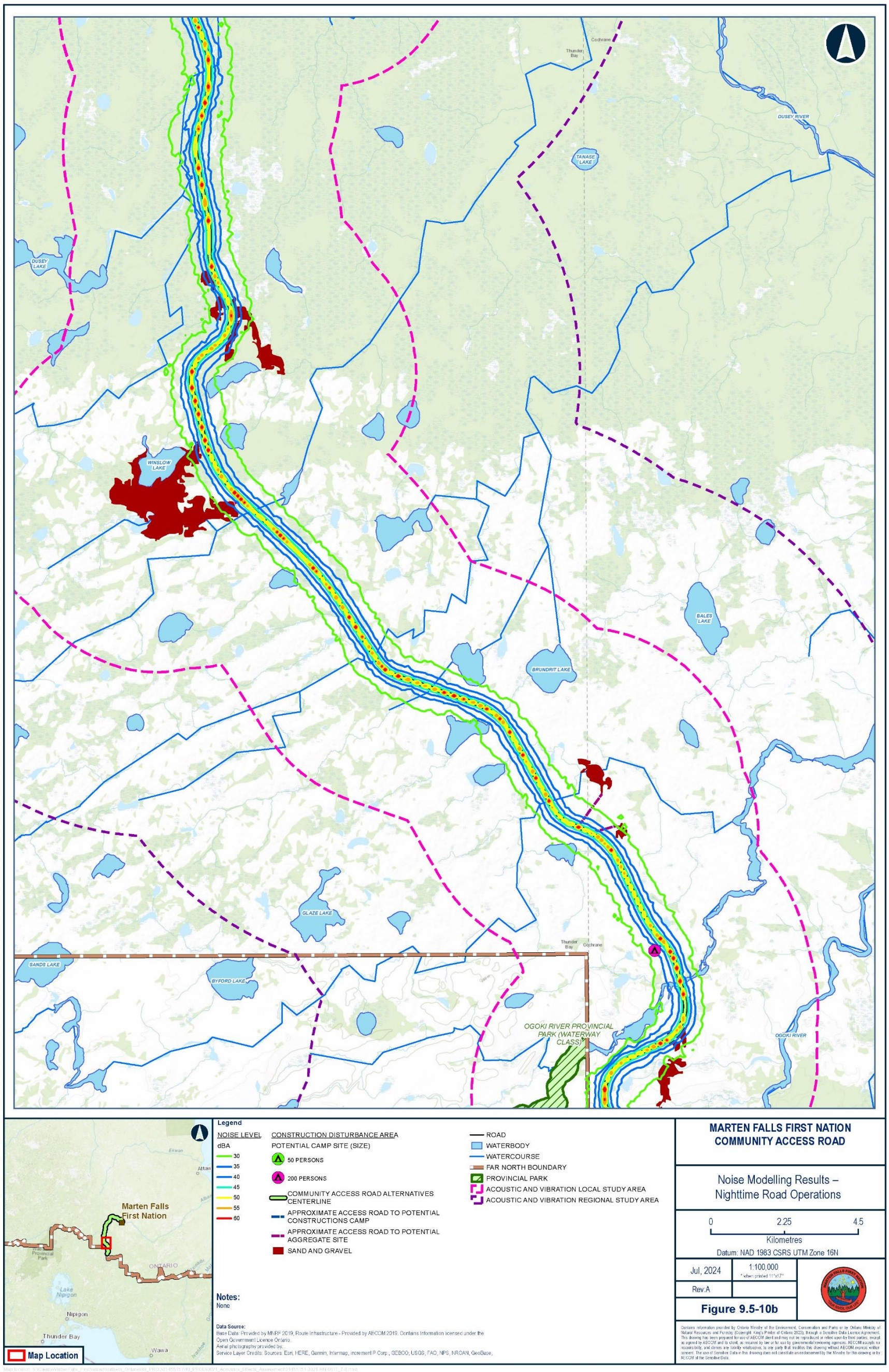


Figure 9.5-10c: Noise Modelling Results – Nighttime Road Operations

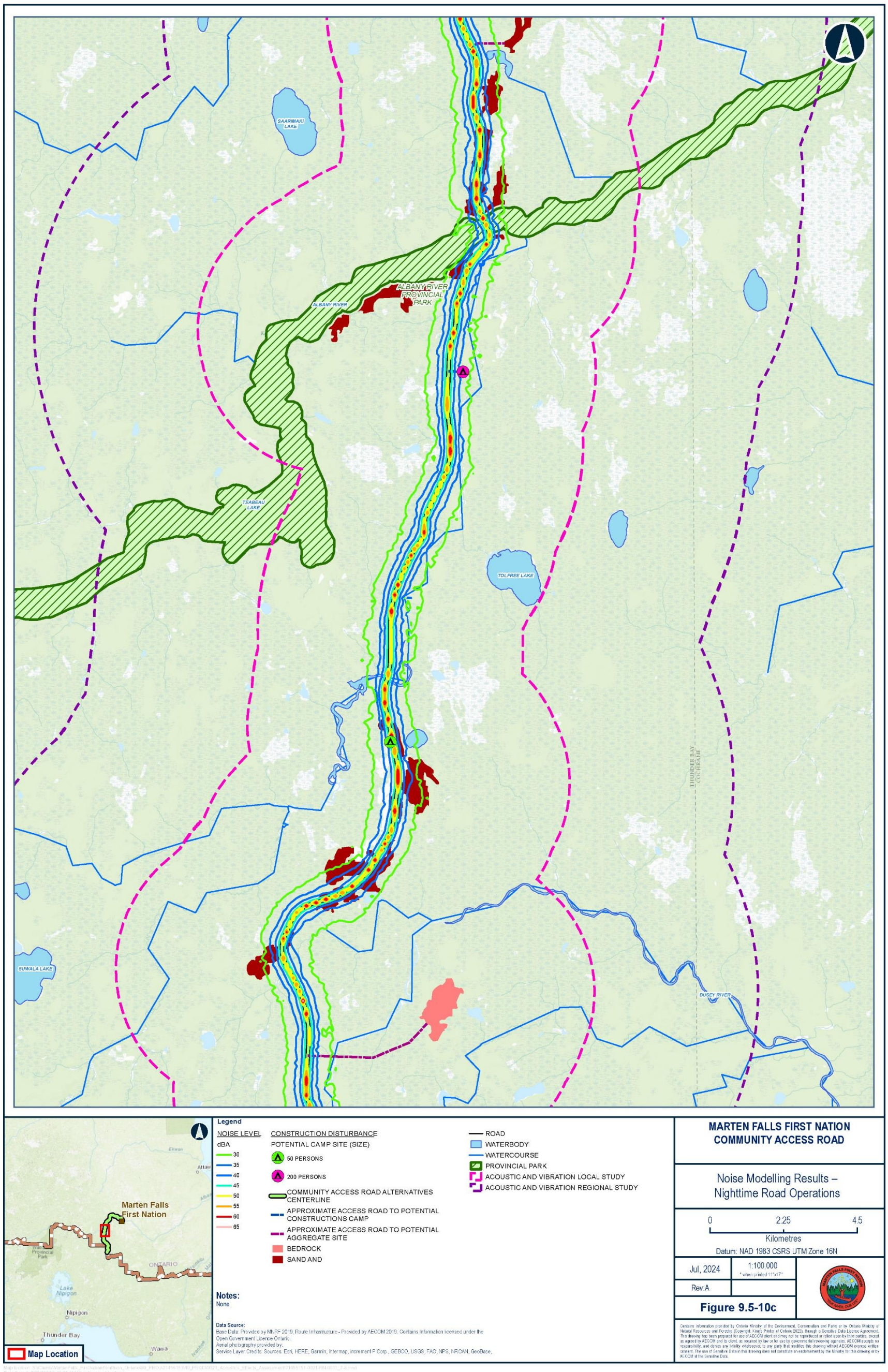


Figure 9.5-10d: Noise Modelling Results – Nighttime Road Operations

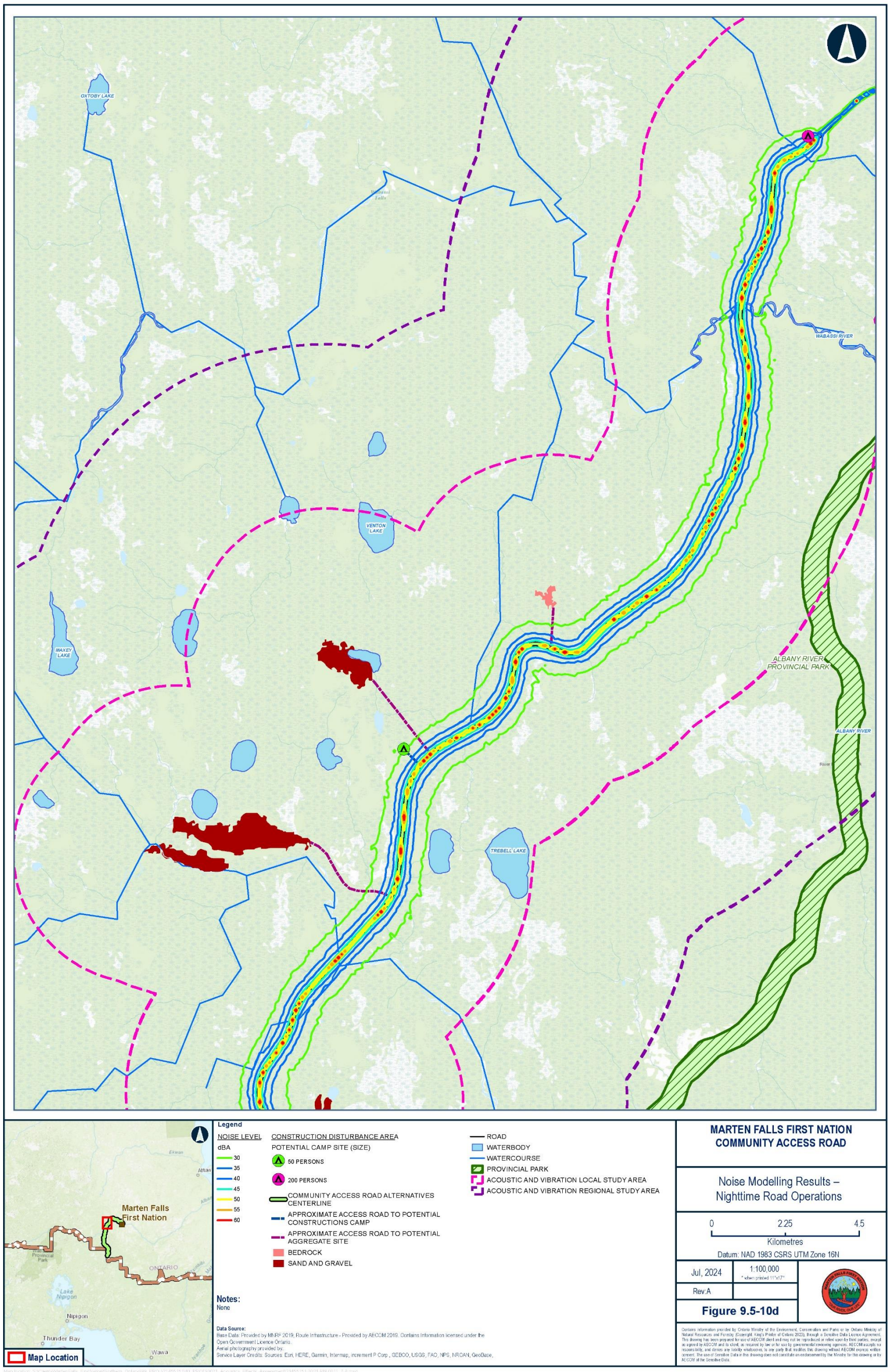


Figure 9.5-10e: Noise Modelling Results – Nighttime Road Operations

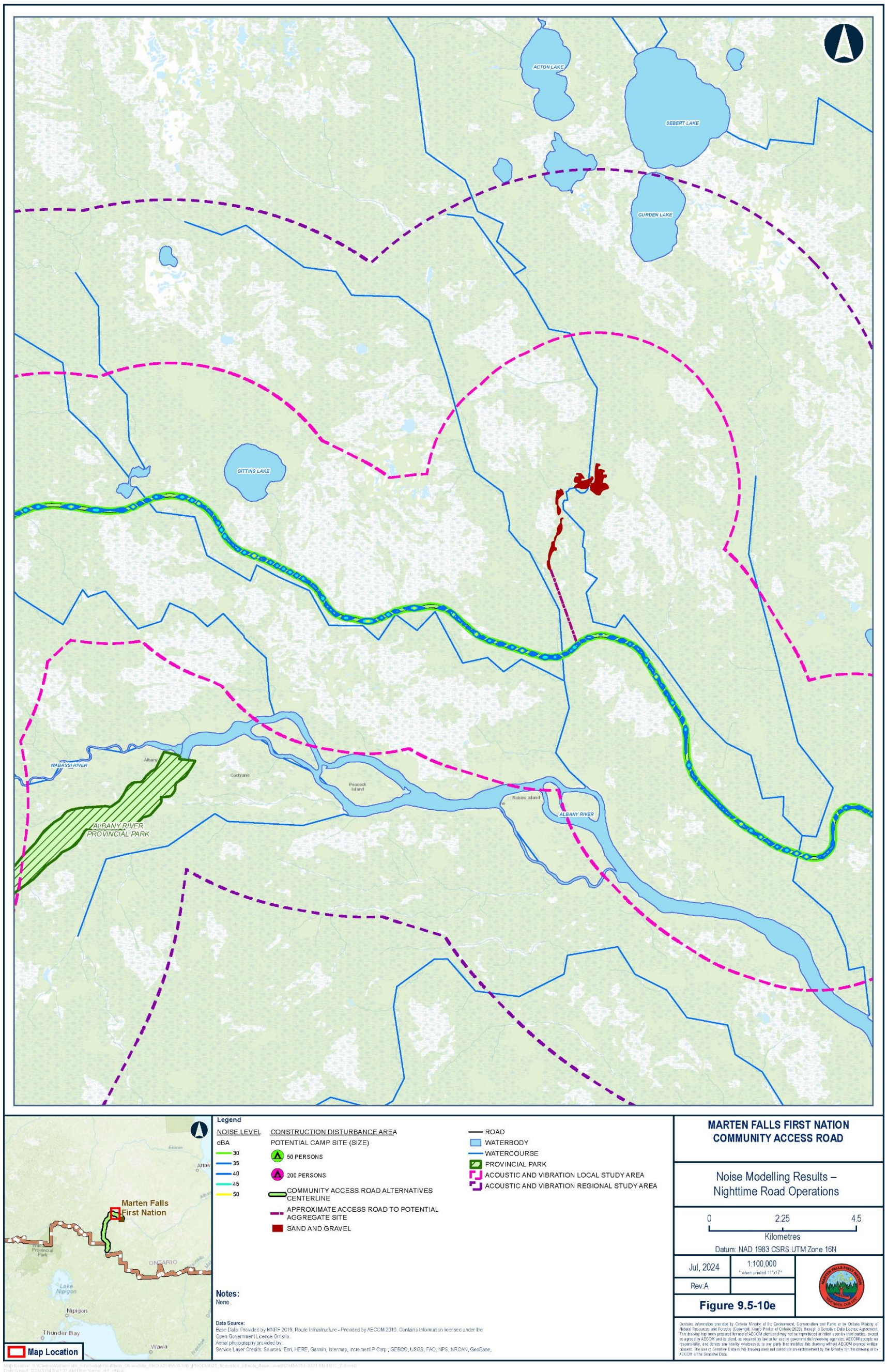
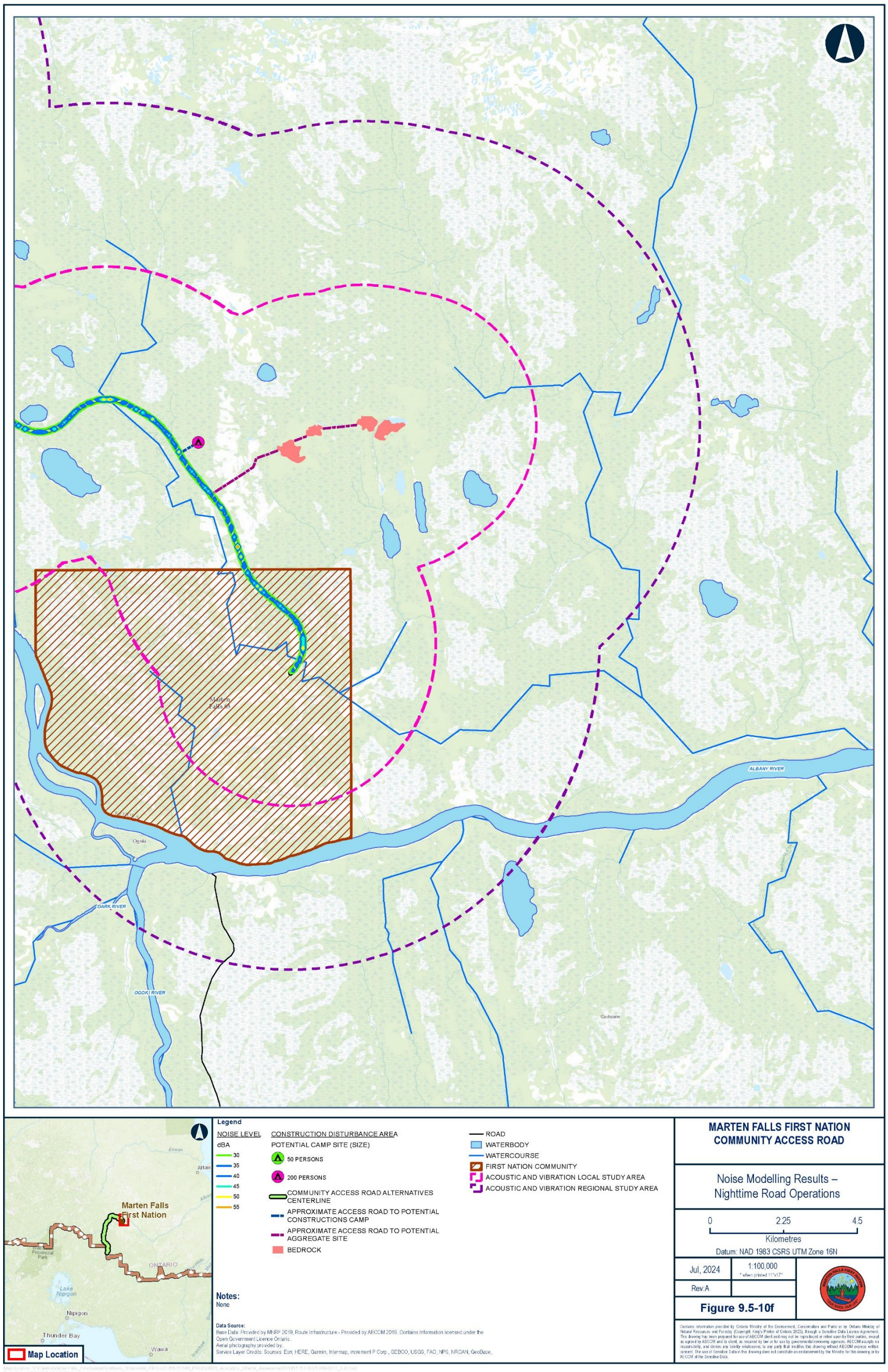


Figure 9.5-10f: Noise Modelling Results – Nighttime Road Operations



It is expected that the pits and quarries that continue operating during Project operations will require a permit / licence application for aggregate extraction under other municipal and / or provincial jurisdictions (in other words, Ministry of the Environment, Conservation and Parks and Ministry of Natural Resources). This permitting process is expected to include a quantitative noise assessment for each quarry in accordance with NPC-300. As part of these noise assessments, it is expected that the points of reception in the vicinity of the quarries and the equipment operating at the quarries will be refined, and noise mitigation requirements will be determined if needed. It is expected that, through this process, the noise assessments will demonstrate that the quarries comply with the applicable NPC-300 sound level limits.

9.5.3.4.1.2 Mitigation and Enhancement Measures

It is expected that it will be demonstrated through the permitting process that noise levels from the pits and quarries comply with the applicable NPC-300 sound level limits. If required, mitigation measures will be determined during the permitting process.

9.5.3.4.1.3 Predicted Residual Effects

Noise emissions during operations may result in a potential effect because it is predicted that, after the implementation of impact management measures, exceedances of applicable criteria at potential points of reception within 100 metres of an active pit and quarry may occur. This potential effect is therefore carried through for further assessment in the following sections, including an assessment of significance.

9.5.3.4.2 Changes to Vibration Level

9.5.3.4.2.1 Potential Effects

The vibrations induced by vehicle traffic due to the operation of the Community Access Road (in other words from road traffic) were estimated to meet the human annoyance criteria beyond 25 metres of the edge of the Community Access Road (in other words, approximately 31 metres from the Community Access Road centreline). The City of Toronto Bylaw 514-2008 preliminary zone of influence criteria (such as, 5 millimetres per second) for building damage is expected to be within the edges of the road when assuming a crest factor of 4 to estimate peak particle velocity vibration levels due to the operation of the Community Access Road (in other words, from road traffic).

The existing vibration levels due to quarry blasting activities can be expected to increase, on occasion, at nearby points of reception, but blast-induced vibration is expected to be temporary in nature, occur only during specific activities, and limited to the vicinity of the Project footprint within the Study Area. The range in increased vibration levels associated with blasting during operations will depend primarily on the

maximum explosive weight detonated at any given instance and the proximity to the points of reception (in other words, the Project vibration levels in the environment generally decrease as the distance between the point of reception and maximum charge weight detonated at a given instance [in other words, delay period]).

9.5.3.4.2.2 Mitigation and Enhancement Measures

No mitigation is expected for vibration from the vehicle traffic along the road due to the operation of the Community Access Road.

Mitigation measures that relate to blasting will be carried forward from construction to the quarry blasting that occurs during operations.

9.5.3.4.2.3 Predicted Residual Effects

Vehicle use on the road due to the operation of the Community Access Road has not been carried forward for further assessment as no residual effect is expected.

Vibration during operations from quarry blasting may result in a potential effect because it is predicted that, after the implementation of impact management measures, exceedances of applicable criteria at potential points of reception may occur. This potential effect is therefore carried through for further assessment in the following sections, including an assessment of significance.

9.5.3.5 Summary of Residual Effects

Table 9.5-13 provides a summary of the potential effects for acoustic environment, mitigation measures, and residual effects. Detailed information is included in **Appendix P**.

Table 9.5-13:Summary of Residual Effects for Acoustic Environment

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Noise**	• Clearing, grading, earth moving, grubbing of vegetation, and stockpiling of materials along the right-of-way and other access and construction areas, and construction of infrastructure (for example, access roads, bridges, temporary laydown areas, turn-around areas, and temporary construction camps) • Reclamation and decommissioning of access roads, temporary laydown areas, staging areas and construction camps • Use of pits and quarries	• Construction	• Construction activities may result in an increase in noise levels	• Conduct construction activities during the daytime period (7 a.m. to 7 p.m.). Nighttime work is not anticipated. In the event construction will occur beyond the daytime period, applicable mitigation measures will be reviewed and implemented as required. • Check that equipment and machinery used on site is maintained in good working conditions through regular maintenance and inspection. • Design access roads to minimize reversing, which is expected to minimize use of backup beepers, where possible. • Locate and operate construction equipment as far as possible from points of reception. • Engage with Indigenous communities and relevant stakeholders to coordinate the planned construction schedule before the start of construction and prior to specific noisy activities to minimize overlap with the timing of traditional land use activities (for example, fall and spring hunting seasons). • Where reasonable and practicable, turn off vehicles and equipment when idle, unless weather and / or safety conditions dictate the need for them to remain turned on and in a safe operating condition. • Investigate noise concerns as they arise through a complaint resolution mechanism developed by the owner / operator whereby persons can contact the Project team if there are perceived noise issues. • Operate vehicles and equipment to minimize impulsive noise, where possible.	• Net change in noise levels during construction activities	• Context: Ecological, Social • Direction: Negative • Magnitude: High • Geographic Extent: Local • Duration: Short term • Frequency: Infrequent • Reversibility: Reversible • Probability: Certain • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Direct
• **Noise**	• Operations of the right-of-way, fencing, and permanent access roads • Use of pits and quarries	• Operations	• Operations activities may result in an increase in noise levels	• Maintain the surface of the road such that rough surface conditions are avoided. • Operate pits and quarries in accordance with NPC-300 and applicable permitting requirements. • Conduct maintenance activities during the daytime period (7 a.m. to 7 p.m.). • Check that equipment and machinery used for site maintenance is maintained in good working conditions through regular maintenance and inspection. • Where reasonable and practicable, turn off maintenance equipment when idle, unless weather and / or safety conditions dictate the need for them to remain turned on and in a safe operating condition. • Operate maintenance equipment to minimize impulsive noise, where possible.	• Net change in noise levels during operations activities (road / quarry)	• Context: Ecological, Social • Direction: Negative • Magnitude: Low / High • Geographic Extent: Local • Duration: Long term • Frequency: Frequent / Infrequent • Reversibility: Reversible • Probability: Certain • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Vibration**	• Clearing, grading, earth moving, grubbing of vegetation, and stockpiling of materials along the right-of-way and other access and construction areas, and construction of infrastructure (for example, access roads, bridges, temporary laydown areas, turn-around areas, and temporary construction camps) • Reclamation and decommissioning of access roads, temporary laydown areas, staging areas and construction camps • Use of pits and quarries	• Construction	• Construction activities may result in an increase in vibration levels	• Develop a Construction Vibration Workplan prior to the start of construction describing the construction schedule, list of construction equipment, list of point of reception locations (such as, traditional land use, residential, heritage structures and utilities), applicable guidance documents including criteria and control measures. • Consider the use of frequency-dependent vibration limits as more detailed information regarding the construction activities is known. • Engage with Indigenous communities and relevant stakeholders to coordinate the planned construction schedule before the start of construction and prior to specific activities that may generate vibration to minimize overlap with the timing of traditional land use activities (for example, fall and spring hunting seasons). • Investigate vibration concerns as they arise through a complaint resolution mechanism whereby persons can contact the Project team if there are perceived vibration issues. • Construction activities should be limited to the daytime period (7 a.m. to 7 p.m.). Nighttime work is not anticipated. In the event construction will occur beyond the daytime period, applicable mitigation measures will be reviewed and implemented as required. • Locate and operate construction equipment as far as possible from points of reception. • Avoid operating equipment that is expected to generate significant vibration at the same time. Operating them separately may reduce overall vibration levels. • Construction blasting will be carried out in compliance with the General Specification for the use of Explosives (Ministry of Transportation. 2014) and NPC-119: Blasting (Ministry of the Environment, 1978). The General Specification for the use of Explosives details items such as vibration limits, protective measures, preblast surveys and notification to nearby owners and tenants. All blasts, which might impact local structures or disrupt humans, will be monitored for ground and air vibrations. • Blasting at temporary or existing quarries will be carried out to comply with the conditions provided in the licence or aggregate permit, if a licence or aggregate permit exists or is required. • Blasting delays and blast mats will be used, as appropriate, to control vibration and fly rock as required.	• Net change in vibration levels during construction activities	• Context: Ecological, Social • Direction: Negative • Magnitude: High • Geographic Extent: Local • Duration: Short term • Frequency: Infrequent • Reversibility: Reversible • Probability: Certain • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Vibration**	• Operations of the right-of-way, fencing, and permanent access roads • Use of pits and quarries	• Operations	• Operations activities may result in an increase in vibration levels	• Maintain the surface of the road such that rough surface conditions are avoided. • Blasting will be carried out in compliance with NPC-119. • Quarry blasting will be carried out to comply with the conditions provided in the licence or aggregate permit, if a licence or aggregate permit exists or is required. • Blasting delays and blast mats will be used, as appropriate, to control vibration and fly rock as required.	• Net change in vibration levels during operations activities (quarry blasting)	• Context: Ecological, Social • Direction: Negative • Magnitude: High • Geographic Extent: Local • Duration: Short term • Frequency: Infrequent • Reversibility: Reversible • Probability: Certain • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Direct

9.5.4 Atmospheric Environment

9.5.4.1 Air Quality

9.5.4.1.1 Project-Environment Interactions

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• **Construction and Operation**	• Mobilization of equipment and supplies • Temporary construction staging areas • Temporary access roads and trails • Temporary construction camps • Right-of way clearing and grubbing • Pits and quarries • Temporary concrete batch plants • Drilling / blasting / aggregate production • Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction site restoration • Rehabilitation (progressive and final) and surrender of pits and quarries in accordance with the *Aggregate Resources Act*. • Decommissioning of temporary camps, roads / trails and staging areas	• Air Quality	• Concentration of air contaminants: • nitrogen dioxide • carbon monoxide • sulphur dioxide • Total Suspended Particulate • particulate matter less than 10 micrometres • particulate matter less than 2.5 micrometres • Selected Volatile Organic Compounds (acrolein, acetaldehyde, benzene, formaldehyde, 1,3-butadiene, toluene, ethylbenzene, and xylene) • Polycyclic aromatic hydrocarbons (benzo(a)pyrene)	• Change in concentration of air contaminants

9.5.4.1.2 Discipline-Specific Characteristics

In support of the residual effects characteristics described in **Section 6.7.3**, **Table 6-1**, the following air quality definitions apply to the effects assessment.

Ecological and Social Context

For the air quality assessment, ecological and social context is directly related to changes in air quality with respect to relevant air quality criteria.

Modelling was completed for the construction and operation phases of this Project. Predicted impacts from the model were combined with monitored background air quality to determine the potential effects.

The potential residual effects were assessed along the Construction Disturbance Area and at the Marten Falls First Nation community for the construction and operational scenarios. Community-specific models were developed to provide predicted impacts of road construction activities in close proximity to the Marten Falls First Nation community. Community model results were based on a worst-case operations condition assuming the worst-case emissions for each indicator compound across all construction operations / activities where all equipment and construction-related activities are occurring at the same time. This includes blasting and burning emissions. This scenario is unlikely to occur during periods of construction however it was assessed to provide the most conservative model results for the purpose of evaluating potential air quality impacts at the Marten Falls First Nation community location.

Magnitude

For magnitude, environmental discipline-specific definitions are required and are provided below in **Table 9.5-14**. Magnitude of effects are project-related and exclude variations due to climate change.

Table 9.5-14: Air Quality Magnitude Definition

Magnitude Level	Definition	Rationale
• **Negligible**	• Cumulative concentrations (Community Access Road plus background) are below air quality criteria and an increase of less than 50 percent of existing conditions values at sensitive receptors	• Magnitude definitions consider compliance with air quality criteria and changes from existing conditions (Ministry of the Environment, Conservation and Parks, 2020; Canadian Council of Ministers of the Environment, 2025)

Magnitude Level	Definition	Rationale
• Low	• Cumulative concentrations (Community Access Road plus background) are below air quality criteria and an increase of more than 50 percent of existing conditions values at sensitive receptors	• Same as previous
• Medium	• Cumulative concentrations (Community Access Road plus background) exceed air quality criteria, and an increase of less than 50 percent of existing conditions values at sensitive receptors	• Same as previous
• High	• Cumulative concentrations (Community Access Road plus background) exceed air quality criteria, and an increase of more than 50 percent of existing conditions values at sensitive receptors	• Same as previous

9.5.4.1.3 Residual Effects – Construction Phase

9.5.4.1.3.1 Potential Effects

Nitrogen Dioxide

The largest contributor to the predicted impact of hourly nitrogen dioxide emissions are quarry blasting operations. Comparing the predicted impacts against the hourly nitrogen dioxide Ambient Air Quality Criteria, no individual construction activity predicted an impact that would result in an exceedance of the 1-hour thresholds besides demonstrating an increase in background concentrations above 50 percent of the existing conditions. The largest contributor to the predicted impact of 24-hour nitrogen dioxide emissions is land clearing operations (in other words, biomass / tree burning). No activity resulted in an exceedance of the 24-hour thresholds besides demonstrating an increase in background concentrations above 50 percent of the existing conditions. Annual results were elevated above Canadian Ambient Air Quality Standards criteria.

Total Suspended Particulates

The largest contributor to the predicted impact of 24-hour Total Suspended Particulate emissions is biomass burning during Operations. Exceedances of the 24-hour thresholds (Ambient Air Quality Criteria, 50 percent of Ambient Air Quality Criteria and 50 percent of ambient background), may occur during road construction activities, access road usage to aggregates and burning operations.

No construction activity was shown to exceed any threshold for the annual averaging period with the exception of the access road. The access road was shown to exceed the

threshold for maximum distance to criteria with background removed. This threshold indicates that when effects of Project and ambient background concentrations are considered, there is the potential for exceedance of the Ambient Air Quality Criteria. The ambient Total Suspended Particulate concentrations represent 94 percent of the Ambient Air Quality Criteria.

Particulate Matter 10 micrometres or less in diameter

The largest contributor to the predicted impact of 24-hour particulate matter less than 10 micrometres emissions is biomass burning operations. Exceedances of the 24-hour thresholds (Ambient Air Quality Criteria, 50 percent of criteria, 50 percent of ambient background and criteria minus background) may occur during road construction activities, access road usage and burning operations.

Particulate Matter 2.5 micrometres or less in diameter

The largest contributor to the predicted impact of 24-hour particulate matter less than 2.5 micrometres emissions is biomass burning operations. Exceedances of the 24-hour thresholds (Ambient Air Quality Criteria, Canadian Ambient Air Quality Standards, 50 percent of criteria, 50 percent of ambient background and criteria minus background) may occur during road construction activities and burning operations.

Sulfur Dioxide

The largest contributor to the predicted impact of 10-min as well as 1-hour sulphur dioxide emissions is quarry blasting operations. With the exception of quarry blasting and road blasting, comparing the predicted impacts against both the 10-min and hourly Ambient Air Quality Criteria as well as the 1-hour Canadian Ambient Air Quality Standards, no individual construction activity predicted an impact that would result in an exceedance of either the 10-min or 1-hour thresholds except for demonstrating an increase in background concentrations above 50 percent of the existing conditions. As previously noted, the Canadian Ambient Air Quality Standards are stringent aspirational regional air quality targets and not Project-specific air quality criteria.

No activities were shown to exceed any threshold for the annual averaging period.

Carbon Monoxide

The largest contributor to the predicted impact of 1-hour and 8-hour carbon monoxide emissions is quarry blasting operations. With the exception of quarry blasting, comparing the predicted impacts against the hourly Ambient Air Quality Criteria, no individual construction activity predicted an impact that would result in an exceedance of

the 1-hour or 8-hour thresholds with except for demonstrating an increase in background concentrations above 50 percent of the existing conditions.

Acrolein

The largest contributor to the predicted impact of hourly acrolein emissions is bridge building operations. The activity associated with bridge building including fossil fuel combustion from heavy-duty construction equipment and the location of bridge building sources compared to distance to the edge of the Construction Disturbance Area (in other words, operations occurring in close proximity to the edge of the road) contribute to the maximum predicted impacts from volatile organic compounds. With the exception of bridge building, comparing the predicted impacts against the hourly Ambient Air Quality Criteria, no individual construction activity predicted an impact that would result in an exceedance of the 1-hour thresholds.

No construction activity was shown to exceed any threshold for the 24-hour averaging period with the exception of bridge building activities that demonstrating an increase in background concentrations above 50 percent of the existing conditions.

Acetaldehyde

No construction activity was shown to exceed any threshold for the 0.5-hour or 1-hour averaging periods with the exception of bridge building activities that demonstrating an increase in background concentrations above 50 percent of the existing conditions.

Benzene

No construction activity was shown to exceed any threshold for the 24-hour or annual averaging periods.

Formaldehyde

No construction activity was shown to exceed any threshold for the 24-hour averaging period.

1, 3-Butadiene

No construction activity was shown to exceed any threshold for the 24-hour or annual averaging periods.

Toluene

No construction activity was shown to exceed any threshold for the 24-hour averaging period with the exception of bridge building which demonstrated an increase in background concentrations above 50 percent of the existing conditions. The activity

associated with bridge building including fossil fuel combustion from heavy-duty construction equipment and the location of bridge building sources compared to distance to the edge of the Construction Disturbance Area (in other words, operations occurring in close proximity to the edge of the road) of operations contribute to the maximum predicted impacts from volatile organic compounds.

Ethylbenzene

No construction activity was shown to exceed any threshold for the 24-hour averaging period with the exception of burning operations which demonstrated an increase in background concentrations above 50 percent of the existing conditions.

Xylene

No construction activity was shown to exceed any threshold for the 24-hour averaging period with the exception of bridge building which demonstrated an increase in background concentrations above 50 percent of the existing conditions. The activity associated with bridge building including fossil fuel combustion from heavy-duty construction equipment and the location of bridge building sources compared to distance to the edge of the Construction Disturbance Area (in other words, operations occurring in close proximity to the edge of the road) of operations contribute to the maximum predicted impacts.

Benzo(a)Pyrene

The largest contributor to the predicted impact of 24-hour Benzo(a)Pyrene emissions is bridge building operations. The activity associated with bridge building including fossil fuel combustion from heavy-duty construction equipment and the location of bridge building sources compared to distance to the edge of the Construction Disturbance Area (in other words, operations occurring in close proximity to the edge of the road) contribute to the maximum predicted impacts from volatile organic compounds. With the exception of bridge building, comparing the predicted impacts against the 24-hour Ambient Air Quality Criteria, no individual construction activity predicted an impact that would result in an exceedance of the 24-hour thresholds with except for demonstrating an increase in background concentrations above 50 percent of the existing conditions.

No individual construction activity predicted an impact that would result in an exceedance of the annual thresholds with except for demonstrating an increase in background concentrations above 50 percent of the existing conditions.

Diesel Particulate Matter

Diesel Particulate Matter emissions are generated from tailpipe emissions of diesel-fired combustion equipment. To provide a conservative estimate of Diesel Particulate Matter emissions, it is assumed that they are equal tailpipe emissions of particulate matter less than 2.5 micrometres.

There are currently no Ontario Ambient Air Quality Criteria to evaluate the predicted impact of Diesel Particulate Matter emissions.

The maximum 24 hour and annual Diesel Particulate Matter concentrations during construction are 15.1 micrograms per cubic metre and 2.0 micrograms per cubic metre respectively. The maximum concentrations of Diesel Particulate Matter occur in close proximity to diesel-fired heavy construction equipment.

Dustfall

Model results indicate that predicted dustfall loadings that are above annual criteria during road construction at some receptors. Contour plots indicate that the predominate contributing source modelled is the quarry access road. The dustfall loading is expected to be influenced by fugitive dust generated by haul trucks transporting aggregate material from quarries on an unpaved access road. Dustfall levels were modelled to be elevated above annual criteria up to approximately 280 metres from the edge of the road.

Model results do not predict elevated dustfall loadings greater than the 30-day criteria during construction activities.

Table 9.5-15 and **Table 9.5-16** present the maximum predicted ground level concentration of each indictor compound without the removal of meteorological anomalies or mitigation. Results are included for both a maximum construction scenario (in other words, equipment and activities operations at the same time, this would include blasting operations occurring at the same time of other activities) as well as a summary of modelled maximum ground level concentrations on an individual activity basis. Where exceedances to criteria were not present or indicator compounds were not released as part of an individual activity's emissions (such as, benzene emissions during quarry blasting) maximum ground level concentrations are not provided.

Table 9.5-15: Summary of Maximum Point of Impingement Results - Construction North-South Segment

Indicator Compound	Averaging Period	Criteria (micrograms per cubic metre)	Guideline	Basis	Ambient (micrograms per cubic metre)	Maximum Point of Impingement (micrograms per cubic metre)	Percent Criteria (Project Only)	Percent Criteria (Project plus Background)
NO_2	1 hr	400	Ontario Ambient Air Quality Criteria	Health	3.8	275	69%	70%
NO_2	1 hr	**79**	Canadian Ambient Air Quality Standards (2025)	Health and Environment	3.8	275	>100	>100
NO_2	24 hr	200	Ontario Ambient Air Quality Criteria	Health	3.1	88	44%	46%
NO_2	Annual	**22.6**	Canadian Ambient Air Quality Standards (2025)	Health and Environment	1.3	27	>100	>100
$PM_{2.5}$	24 hr	27	Ontario Ambient Air Quality Criteria (2023) Canadian Ambient Air Quality Standards(2025)	Health/Health and Environment	8.0	245	>100	>100
$PM_{2.5}$	Annual	8.8	Ambient Air Quality Criteria (2023) Canadian Ambient Air Quality Standards(2025)	Health/Health and Environment	5.1	2	26%	84%
PM_{10}	24 hr	50	Ontario Ambient Air Quality Criteria	Health	31.2	308	>100	>100
TSP	24 hr	120	Ontario Ambient Air Quality Criteria	Visibility	89.1	433	>100	>100
TSP	Annual	60	Ontario Ambient Air Quality Criteria	Visibility	56.7	12	20%	>100
SO_2	10 min	**178**	Ontario Ambient Air Quality Criteria	Health	4.3	18,250	>100	>100
SO_2	1 hr	**100**	Ontario Air Contaminants Benchmarks List	Health	2.6	11,060	>100	>100
SO_2	1 hr	**170**	Canadian Ambient Air Quality Standards (2025)	Health and Environment	2.6	11,060	>100	>100
SO_2	Annual	**10**	Canadian Ambient Air Quality Standards (2025)	Health and Environment	1.3	0.23	2%	15%
SO_2	Annual	**10**	Ontario Ambient Air Quality Criteria	Vegetation	1.3	0.23	2%	15%
CO	1 hr	36,200	Ontario Ambient Air Quality Criteria	Health	469.7	189,631	>100	>100
CO	8 hr	15,700	Ontario Ambient Air Quality Criteria	Health	454.0	31,419	>100	>100
Acrolein	1 hr	4.5	Ontario Ambient Air Quality Criteria	Health	0.1	2	52%	54%
Acrolein	24 hr	0.4	Ontario Ambient Air Quality Criteria	Health	0.04	0.39	97%	>100
Acetaldehyde	0.5 hr	500	Ontario Ambient Air Quality Criteria	Health	10.05	13	3%	5%
Acetaldehyde	24 hr	500	Ontario Ambient Air Quality Criteria	Health	3.4	2	0%	1%
Benzene	24 hr	2.3	Ontario Ambient Air Quality Criteria	Health	0.5	0.8	35%	57%
Benzene	Annual	0.45	Ontario Ambient Air Quality Criteria	Health	0.3	0.1	23%	90%
Formaldehyde	24 hr	65	Ontario Ambient Air Quality Criteria	Health	10.7	5.0	8%	24%
1,3 Butadiene	24 hr	10	Ontario Ambient Air Quality Criteria	Health	0.8	0.1	1%	9%
1,3 Butadiene	Annual	2	Ontario Ambient Air Quality Criteria	Health	0.9	0.004	0%	45%
Toluene	24 hr	2,000	Ontario Ambient Air Quality Criteria	Odour	0.5	0.64	0%	0%
Ethylbenzene	10 min	1,900	Ontario Air Contaminants Benchmarks List	Odour	0.8	8.2	0%	0%
Ethylbenzene	24 hr	1,000	Ontario Ambient Air Quality Criteria	Health	0.2	2.0	0%	0%
Xylene	10 min	3,000	Ontario Ambient Air Quality Criteria	Odour	2.8	2.5	0%	0%
Xylene	24 hr	730	Ontario Ambient Air Quality Criteria	Health	0.7	0.6	0%	0%
Benzo(a)pyrene	24 hr	0.00005	Ontario Ambient Air Quality Criteria	Health	0.00003	0.00008	>100	>100
Benzo(a)pyrene	Annual	0.00001	Ontario Ambient Air Quality Criteria	Health	0.00002	0.00001	98%	>100
DPM	24 hr	Not applicable	Not applicable	Not applicable	0.6	15.1	Not applicable	Not applicable
DPM	Annual	Not applicable	Not applicable	Not applicable	0.4	2.0	Not applicable	Not applicable
Dustfall	30-day	7	Ontario Ambient Air Quality Criteria	Soiling	Not applicable	3.0	42%	Not applicable
Dustfall	Annual	4.6	Ontario Ambient Air Quality Criteria	Soiling	Not applicable	28	>100	Not applicable

Footnotes: Maximum Point of Impingement results occur immediately adjacent to construction activities.
10-min averaging periods were converted from 1-hr results.
Not applicable indicates not applicable.
Bold values were converted from parts per billion.

Table 9.5-16: Summary of Maximum Point of Impingement Results - Construction East-West Community Segment

Indicator Compound	Averaging Period	Criteria [micrograms per cubic metre]	Guideline	Basis	Ambient [micrograms per cubic metre]	Maximum Point of Impingement [micrograms per cubic metre]	Percent Criteria [Project Only]	Percent Criteria [Project plus Background]
NO_2	1 hr	400	Ontario Ambient Air Quality Criteria	Health	3.8	170	43%	43%
NO_2	1 hr	**79**	Canadian Ambient Air Quality Standards (2025)	Health and Environment	3.8	170	>100	>100
NO_2	24 hr	200	Ontario Ambient Air Quality Criteria	Health	3.1	54	27%	28%
NO_2	Annual	**22.6**	Canadian Ambient Air Quality Standards (2025)	Health and Environment	1.3	3	14%	20%
$PM_{2.5}$	24 hr	27	Ontario Ambient Air Quality Criteria (2023) Canadian Ambient Air Quality Standards (2025)	Health/Health and Environment	8.0	156	>100	>100
$PM_{2.5}$	Annual	8.8	Ontario Ambient Air Quality Criteria (2023) Canadian Ambient Air Quality Standards (2025)	Health/Health and Environment	5.1	0.79	9%	67%
PM_{10}	24 hr	50	Ontario Ambient Air Quality Criteria	Health	31.2	175	>100	>100
TSP	24 hr	120	Ontario Ambient Air Quality Criteria	Visibility	89.1	348	>100	>100
TSP	Annual	60	Ontario Ambient Air Quality Criteria	Visibility	56.7	3	5%	100%
SO_2	10 min	**178**	Ontario Ambient Air Quality Criteria	Health	4.3	939	>100	>100
SO_2	1 hr	**100**	Ontario Ambient Air Quality Criteria	Health	2.6	569	>100	>100
SO_2	1 hr	**170**	Canadian Ambient Air Quality Standards (2025)	Health and Environment	2.6	569	>100	>100
SO_2	Annual	**10**	Canadian Ambient Air Quality Standards (2025)	Health and Environment	1.3	0.04	0.4%	13%
SO_2	Annual	**10**	Ontario Ambient Air Quality Criteria	Vegetation	1.3	0.04	0.4%	13%
CO	1 hr	36,200	Ontario Ambient Air Quality Criteria	Health	469.7	12472	34.5%	36%
CO	8 hr	15,700	Ontario Ambient Air Quality Criteria	Health	454.0	3102	19.8%	23%
Acrolein	1 hr	4.5	Ontario Ambient Air Quality Criteria	Health	0.1	0.9	19.1%	21%
Acrolein	24 hr	0.4	Ontario Ambient Air Quality Criteria	Health	0.04	0.1	17.1%	27%
Acetaldehyde	0.5 hr	500	Ontario Ambient Air Quality Criteria	Health	10.1	5	1.0%	3%
Acetaldehyde	24 hr	500	Ontario Ambient Air Quality Criteria	Health	3.4	0.3	0.1%	1%
Benzene	24 hr	2.3	Ontario Ambient Air Quality Criteria	Health	0.6	0.1	6.2%	30%
Benzene	Annual	0.45	Ontario Ambient Air Quality Criteria	Health	0.3	0.0	2.2%	71%
Formaldehyde	24 hr	65	Ontario Ambient Air Quality Criteria	Health	10.7	0.9	1.4%	18%
1,3 Butadiene	24 hr	10	Ontario Ambient Air Quality Criteria	Health	0.8	0.1	0.7%	9%
1,3 Butadiene	Annual	2	Ontario Ambient Air Quality Criteria	Health	0.9	0.01	0.3%	45%
Toluene	24 hr	2,000	Ontario Ambient Air Quality Criteria	Odour	0.5	0.1	0.01%	0.03%
Ethylbenzene	10 min	1,900	Ontario Air Contaminants Benchmarks List	Odour	0.8	5.6	0.3%	0.3%
Ethylbenzene	24 hr	1,000	Ontario Ambient Air Quality Criteria	Health	0.2	1.3	0.1%	0.2%
Xylene	10 min	3,000	Ontario Air Contaminants Benchmarks List	Odour	2.8	0.5	0.02%	0.1%
Xylene	24 hr	730	Ontario Ambient Air Quality Criteria	Health	0.7	0.1	0.02%	0.1%
Benzo(a)pyrene	24 hr	0.00005	Ontario Ambient Air Quality Criteria	Health	0.00003	0.00002	40%	>100
Benzo(a)pyrene	Annual	0.00001	Ontario Ambient Air Quality Criteria	Health	0.00002	0.000001	12%	>100
DPM	24 hr	Not applicable	Not applicable	Not applicable	0.6	3	Not applicable	Not applicable
DPM	Annual	Not applicable	Not applicable	Not applicable	0.4	0.2	Not applicable	Not applicable
Dustfall	30-day	7	Ontario Ambient Air Quality Criteria	Soiling	Not applicable	0.1	2%	Not applicable
Dustfall	Annual	4.6	Ontario Ambient Air Quality Criteria	Soiling	Not applicable	1	25%	Not applicable

Footnotes: Maximum Point of Impingement results occur immediately adjacent to construction activities.
10-min averaging periods were converted from 1-hr results.
Not applicable indicates not applicable.
Bold values were converted from ppb.

9.5.4.1.3.2 Mitigation and Enhancement Measures

Mitigative measure such as the implementation of strategic blasting plans and efforts to utilize low sulphur containing explosives can help reduce the magnitude of effect during blasting events.

Restricting access to construction areas can be implemented to help limit human exposure to the reported maximum ground level concentrations of indicator compounds predicted adjacent to construction operations.

Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are:

- Implement watering during fugitive dust-generating activities such as drilling, material handling and on quarry access roads;
- Limit vehicle speed, where feasible;
- Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points;
- Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber);
- When burning is required, consider avoiding periods where meteorological conditions (for example, wind speed) that may result in smoke impacting sensitive receptor locations;
- Maintain equipment as per manufacturing specifications;
- Implement anti-idling policies or procedures to reduce total vehicle idling times;
- Implement blasting mitigation (for example, charge size) in quarries to minimize potential effects;
- Consider the use explosives with lower sulphur content where possible;
- Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible; and
- Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (OPSS, 2014) and describes specific measures that would be implemented if blasting is required.

- Development of a Construction Monitoring Plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.

9.5.4.1.3.3 Predicted Residual Effects

The predicted impacts of indicator compounds from the representative segment air dispersion model were used for the characterization of residual effects and determination of significance. The predicted impacts at the representative segment are assumed to be extrapolated across the entire Construction Disturbance Area.

The majority of the Construction Disturbance Area is located in areas where prolonged human presence is not anticipated. It should also be noted that due to the transient nature of construction activities (in other words, major construction activities will be short-term at any given location as road development continues), the predicted impacts may be considered temporary in nature.

Construction occurs in a short-term duration and is transient in nature. Construction at any location of the road is only expected for a short period of time before the next section of road is worked on. After periods of construction are completed, elevated levels of indicator compounds contributed by construction-related activities should return to previous conditions. It is expected that residual effects with a high magnitude will occur during construction periods and may impact sensitive receptors for periods of times when construction activities are either located in close proximity to receptors, or during periods of intermittent activities such as blasting and burning.

The dispersion modelling assessment was prepared using conservative emission rates and modelling parameters to present a worst-case impact predicted result. Therefore, the predicted impact is not likely to be exceeded.

The likelihood of effects would range from possible to probable. The likelihood for residual effects were considered probable for indicator compounds assessed with annual averaging periods. It is possible that construction activities will not affect some receptors for an entire year, the annual prediction is therefore conservative. The residual effects presented for annual averaging periods is less likely to be impacted by anomalous meteorological conditions and worst-case activity operations hours. For indicator compounds assessed with shorter averaging periods the likelihood for residual effects was determined to be possible to probable.

The uncertainty of effects is contributed to conservatism is built into the emission rate calculations and dispersion modelling assessment to where the maximum emission

rates and modelling results are presented. The predicted impacts from construction activities presented are not likely to be exceeded.

Uncertainty of receptor characteristics, such as frequency of human presence at receptor locations are also present within this assessment. Sensitive receptors considered as part of this significance assessment included those where human presence is expected for a potentially long duration in time. In the event that humans are not at sensitive receptor locations during constructions the significance of effects is further reduced. For example, spiritual and sacred sites were considered as sensitive receptors however if humans are not present at these locations, particularly those in close proximity to the road or quarry locations during periods of intermittent and consistent construction activities, residual effects could be avoided.

Prediction confidence of effects was determined to be moderate. Representative baseline data was known for receptor locations, potential for Project related effects are mostly understood, and the level of uncertainty associated with receptor data or Project conditions is moderate.

9.5.4.1.4 Residual Effects – Operations Phase

9.5.4.1.4.1 Potential Effects

Nitrogen Dioxide

Along the north-south road segment predicted impacts of NO_2 (Project-only and Project plus background air quality) are not expected to exceed the criteria for either 1-hour, 24-hour or annual averaging periods. Along the east-west road segment predicted impacts of nitrogen dioxide (Project-only and Project plus background air quality) are not expected to exceed nitrogen dioxide criteria for either 1-hour, 24-hour, or annual averaging periods. None of the thresholds developed to assess potential effects were exceeded (in other words, criteria, 50 percent of criteria, 50 percent of background, criteria minus background).

Total Suspended Particulates

Along the north-south road segment the maximum predicted impact of Total Suspended Particulate (Project-only) are expected to exceed Total Suspended Particulate criteria for both 24-hour and annual averaging periods. Total Suspended Particulate 24-hour and annual impacts are predicted to exceed criteria 3,000 metres and 899 metres from the road, respectively. The impact of Total Suspended Particulate with background concentrations added to Community Access Road impacts extended outside of the modelling domain (3,000 metres from the Construction Disturbance Area).

Maximum ground level concentrations of Total Suspended Particulate (Project-only) are expected to exceed 50 percent of 24-hour and annual criteria greater than 3,000 metres and up to 1,591 metres from the edge of the road, respectively.

Along the east to west road segment maximum predicted impacts of Total Suspended Particulate are expected to exceed Total Suspended Particulate criteria for the 24-hour averaging period. Maximum ground level concentrations are expected to exceed or equal 24-hour criteria up to 119 metres from the road. When impacts of background ambient air quality are considered in addition to Project impacts, this distance is extended to 1,001 metres. Maximum predicted impacts are expected to exceed or be equal to 50 percent of 24-hour criteria up to 436 metres.

Exceedances to annual criteria are not expected from Project contributions only, however when background ambient conditions are in addition to Project impacts, the annual criteria is expected to exceed up to 639 metres from the road. Fifty percent of the value of annual criteria is expected to be exceeded up to 27 metres without the contribution of ambient background.

It should be noted that background concentrations of Total Suspended Particulate are relatively high and account for more than 70 percent of both 24-hour and annual criteria. Background concentrations of Total Suspended Particulate will vary seasonally due to the presence of forest fires.

Fugitive road dust emissions from vehicular travel on an unpaved road will be the leading contributor to ground level concentrations of Total Suspended Particulate during operations of Community Access Road. Model results were presented without the effects of mitigation. Pending on mitigation methods applied up to an 80 percent control efficiency may be achieved.

Particulate Matter 10 micrometres or less in diameter

Along the north-south road segment maximum predicted impacts of particulate matter less than 10 micrometres are expected to exceed particulate matter less than 10 micrometres 24-hour criteria. During the operations phases of Community Access Road, maximum ground level concentrations of particulate matter less than 10 micrometres are expected to exceed or be equal to particulate matter less than 10 micrometres criteria up to 1,986 metres from the road. When considering the impacts of background concentrations in addition to Project impacts this distance is extended to 2,987 metres from the road.

Maximum predicted impacts are expected to exceed or be equal to 50 percent of 24-hour criteria up to 2,987 metres without the contribution of ambient background.

Along the east to west road segment maximum predicted impacts of particulate matter less than 10 micrometres are expected to exceed particulate matter less than 10 micrometres 24-hour averaging criteria. Maximum ground level concentrations are expected to exceed or equal 24-hour criteria up to 50 metres from the road. When impacts of background ambient air quality are considered in addition to Project impacts, this distance is extended to 375 metres.

Maximum predicted impacts are expected to exceed or be equal to 50 percent of 24-hour criteria up to 224 metres without the contribution of ambient background.

It should be noted that background concentrations of particulate matter less than 10 micrometres are relatively high and account for greater than 60 percent of 24-hour criteria. Background concentrations of particulate matter less than 10 micrometres may be overstated because of the location of the monitoring station at the community and will also vary seasonally due to the presence of forest fires.

Fugitive road dust emissions from vehicular travel on an unpaved road will be the leading contributor to ground level concentrations of particulate matter less than 10 micrometres during operations of Community Access Road.

Particulate Matter 2.5 micrometres or less in diameter

Along the north-south road segment maximum predicted impacts of particulate matter less than 2.5 micrometres are expected to exceed particulate matter less than 2.5 micrometres 24-hour and annual criteria. During the operations phases of Community Access Road, maximum ground level concentrations of particulate matter less than 2.5 micrometres are expected to exceed or be equal to particulate matter less than 10 micrometres criteria up to 115 metres and 134 metres from the road for 24-hour and annual criteria respectively. When considering impacts of background concentrations of particulate matter less than 2.5 micrometres in addition to Project impacts this distance is extended to 207 metres and 414 metres for 24-hour and annual criteria respectively.

Maximum predicted impacts are expected to exceed or be equal to 50 percent of 24-hr and annual criteria up to 433 metres and 336 metres respectively, without the contribution of ambient background.

Along the east to west road segment maximum predicted impacts of particulate matter less than 2.5 micrometres are not expected to exceed particulate matter less than 2.5 micrometres 24-hour or annual averaging criteria. Exceedances are also not expected when impacts of background ambient air quality are considered in addition to Project impacts.

Maximum predicted impacts are not expected to exceed or be equal to 50 percent of 24-hour criteria without the contribution of ambient background.

The maximum distance to 50 percent of 24-hour background conditions is 92 metres from the road.

Fugitive road dust emissions from vehicular travel on an unpaved road will be the leading contributor to ground level concentrations of particulate matter less than 2.5 micrometres during operations of Community Access Road.

Diesel Particulate Matter

Diesel Particulate Matter emissions are generated from tailpipe emissions of diesel-fired combustion equipment. To provide a conservative estimate of Diesel Particulate Matter emissions, it is assumed that they are equal tailpipe emissions of particulate matter less than 2.5 micrometres.

There are currently no Ontario Ambient Air Quality Criteria to evaluate the predicted impact of Diesel Particulate Matter emissions.

Dustfall

Model results indicate that predicted dustfall loadings are above the 30-day and annual criteria at some receptors during operations of the road along the North/South section (**Table 9.5-17**).

The predicted exceedances of 30-day criteria are expected to occur up to an approximate maximum distance of 45 metres from the edge of the road. The predicted exceedances of annual criteria are expected to occur up to an approximate maximum distance of 681 metres from the edge of the road. Background ambient dustfall was assumed to be zero due to data unavailability.

Model results indicate that predicted dustfall loadings are above the annual criteria at some receptors during operations of the road along the Community Road Segment. No exceedances of the 30-day criteria were predicted.

The predicted exceedances of annual criteria are expected to occur up to an approximate maximum distance of 28 metres from the edge of the road.

Table 9.5-17: Operation Phase North-South Segment - Maximum Point of Impingement Summary

Indicator Compound	Averaging Period	Criteria [micrograms per cubic metre]	Guideline	Basis	Ambient [micrograms per cubic metre]	Maximum Point of Impingement [micrograms per cubic metre]	Percent Criteria [Project Only]	Percent Criteria [Project plus Background]
NO_2	1 hr	400	Ontario Ambient Air Quality Criteria	Health	3.8	10.8	3%	4%
NO_2	1 hr	**79**	Canadian Ambient Air Quality Standards (2025)	Health and Environment	3.8	10.8	14%	18%
NO_2	24 hr	200	Ontario Ambient Air Quality Criteria	Health	3.1	2.3	1%	3%
NO_2	Annual	**22.6**	Canadian Ambient Air Quality Standards (2025)	Health and Environment	1.3	0.9	4%	10%
$PM_{2.5}$	24 hr	27	Ontario Ambient Air Quality Criteria (2023) Canadian Ambient Air Quality Standards (2025)	Health/Health and Environment	8.0	67.4	>100%	>100%
$PM_{2.5}$	Annual	8.8	Ontario Ambient Air Quality Criteria (2023) Canadian Ambient Air Quality Standards (2025)	Health/Health and Environment	5.1	10.0	>100%	>100%
PM_{10}	24 hr	50	Ontario Ambient Air Quality Criteria	Health	31.2	655.5	>100%	>100%
TSP	24 hr	120	Ontario Ambient Air Quality Criteria	Visibility	89.1	2292.6	>100%	>100%
TSP	Annual	60	Ontario Ambient Air Quality Criteria	Visibility	56.7	344.6	>100%	>100%
SO_2	10 min	**178**	Ontario Ambient Air Quality Criteria	Health	4.3	0.02	0.01%	2%
SO_2	1 hr	**100**	Ontario Ambient Air Quality Criteria	Health	2.6	0.01	0.01%	3%
SO_2	1 hr	**170**	Canadian Ambient Air Quality Standards (2025)	Health and Environment	2.6	0.01	0.01%	2%
SO_2	Annual	**10**	Canadian Ambient Air Quality Standards (2025)	Health and Environment	1.3	0.001	0.01%	13%
SO_2	Annual	**10**	Ontario Ambient Air Quality Criteria	Vegetation	1.3	0.001	0.01%	13%
CO	1 hr	36,200	Ontario Ambient Air Quality Criteria	Health	469.7	6.90	0.02%	1%
CO	8 hr	15,700	Ontario Ambient Air Quality Criteria	Health	454.0	2.70	0.02%	3%
Acrolein	1 hr	4.5	Ontario Ambient Air Quality Criteria	Health	0.1	0.001	0.02%	2%
Acrolein	24 hr	0.4	Ontario Ambient Air Quality Criteria	Health	0.04	0.0001	0.04%	10%
Acetaldehyde	0.5 hr	500	Ontario Ambient Air Quality Criteria	Health	10.1	0.01	0.001%	2%
Acetaldehyde	24 hr	500	Ontario Ambient Air Quality Criteria	Health	3.4	0.002	0.0003%	1%
Benzene	24 hr	2.3	Ontario Ambient Air Quality Criteria	Health	0.6	0.0001	0.003%	24%
Benzene	Annual	0.45	Ontario Ambient Air Quality Criteria	Health	0.3	0.00003	0.01%	69%
Formaldehyde	24 hr	65	Ontario Ambient Air Quality Criteria	Health	10.7	0.001	0.002%	16%
1,3 Butadiene	24 hr	10	Ontario Ambient Air Quality Criteria	Health	0.8	0.000005	0.00005%	8%
1,3 Butadiene	Annual	2	Ontario Ambient Air Quality Criteria	Health	0.9	0.000002	0.0001%	45%
Toluene	24 hr	2,000	Ontario Ambient Air Quality Criteria	Odour	0.5	0.001	0.00004%	0.02%
Ethylbenzene	10 min	1,900	Ontario Air Contaminants Benchmarks List	Odour	0.8	0.001	0.00004%	0.04%
Ethylbenzene	24 hr	1,000	Ontario Ambient Air Quality Criteria	Health	0.2	0.0004	0.00004%	0.02%
Xylene	10 min	3,000	Ontario Air Contaminants Benchmarks List	Odour	2.8	0.01	0.0002%	0.1%
Xylene	24 hr	730	Ontario Ambient Air Quality Criteria	Health	0.7	0.003	0.0004%	0.1%
Benzo(a)pyrene	24 hr	0.00005	Ontario Ambient Air Quality Criteria	Health	0.00003	0.0000001	0.27%	67%
Benzo(a)pyrene	Annual	0.00001	Ontario Ambient Air Quality Criteria	Health	0.00002	0.0000001	1%	>100%
DPM	24 hr	Not applicable	Not applicable	Not applicable	0.6	0.02	Not applicable	Not applicable
DPM	Annual	Not applicable	Not applicable	Not applicable	0.4	0.01	Not applicable	Not applicable
Dustfall	30-day	7	Ontario Ambient Air Quality Criteria	Soiling	Not applicable	11.5	>100%	Not applicable
Dustfall	Annual	4.6	Ontario Ambient Air Quality Criteria	Soiling	Not applicable	54.3	>100%	Not applicable

Table 9.5-18: Operation Phase East-West Segment - Maximum Point of Impingement Summary

Indicator Compound	Averaging Period	Criteria [micrograms per cubic metre]	Guideline	Basis	Ambient [micrograms per cubic metre]	Maximum Point of Impingement [micrograms per cubic metre]	Percent Criteria [Project Only]	Percent Criteria [Project plus Background]
NO_2	1 hr	400	Ontario Ambient Air Quality Criteria	Health	3.8	0.5	0.1%	1%
NO_2	1 hr	**79**	Canadian Ambient Air Quality Standards (2025)	Health and Environment	3.8	0.5	1%	5%
NO_2	24 hr	200	Ontario Ambient Air Quality Criteria	Health	3.1	0.2	0.1%	2%
NO_2	Annual	**22.6**	Canadian Ambient Air Quality Standards (2025)	Health and Environment	1.3	0.1	0.2%	6%
$PM_{2.5}$	24 hr	27	Ontario Ambient Air Quality Criteria Canadian Ambient Air Quality Standards (2025)	Health/Health and Environment	8.0	9.7	36%	66%
$PM_{2.5}$	Annual	8.8	Ontario Ambient Air Quality Criteria Canadian Ambient Air Quality Standards (2025)	Health/Health and Environment	5.1	1.2	13%	71%
PM_{10}	24 hr	50	Ontario Ambient Air Quality Criteria	Health	31.2	94.0	>100%	>100%
TSP	24 hr	120	Ontario Ambient Air Quality Criteria	Visibility	89.1	328.8	>100%	>100%
TSP	Annual	60	Ontario Ambient Air Quality Criteria	Visibility	56.7	39.9	66.5%	>100%
SO_2	10 min	**178**	Ontario Ambient Air Quality Criteria	Health	4.3	0.001	0.001%	2%
SO_2	1 hr	**100**	Ontario Ambient Air Quality Criteria	Health	2.6	0.001	0.001%	3%
SO_2	1 hr	**170**	Canadian Ambient Air Quality Standards (2025)	Health and Environment	2.6	0.001	0.001%	2%
SO_2	Annual	**10**	Canadian Ambient Air Quality Standards (2025)	Health and Environment	1.3	0.0001	0.001%	13%
SO_2	Annual	**10**	Ontario Ambient Air Quality Criteria	Vegetation	1.3	0.0001	0.001%	13%
CO	1 hr	36,200	Ontario Ambient Air Quality Criteria	Health	469.7	0.6	0.002%	1%
CO	8 hr	15,700	Ontario Ambient Air Quality Criteria	Health	454.0	0.3	0.002%	3%
Acrolein	1 hr	4.5	Ontario Ambient Air Quality Criteria	Health	0.1	0.00004	0.001%	2%
Acrolein	24 hr	0.4	Ontario Ambient Air Quality Criteria	Health	0.04	0.00001	0.003%	10%
Acetaldehyde	0.5 hr	500	Ontario Ambient Air Quality Criteria	Health	10.1	0.001	0.0001%	2%
Acetaldehyde	24 hr	500	Ontario Ambient Air Quality Criteria	Health	3.4	0.0001	0.00003%	1%
Benzene	24 hr	2.3	Ontario Ambient Air Quality Criteria	Health	0.6	0.00003	0.001%	24%
Benzene	Annual	0.45	Ontario Ambient Air Quality Criteria	Health	0.3	0.00001	0.002%	69%
Formaldehyde	24 hr	65	Ontario Ambient Air Quality Criteria	Health	10.7	0.0001	0.00019%	16%
1,3 Butadiene	24 hr	10	Ontario Ambient Air Quality Criteria	Health	0.8	0.000002	0.00002%	8%
1,3 Butadiene	Annual	2	Ontario Ambient Air Quality Criteria	Health	0.9	0.000001	0.00003%	45%
Toluene	24 hr	2,000	Ontario Ambient Air Quality Criteria	Odour	0.5	0.0001	0.000004%	0.02%
Ethylbenzene	10 min	1,900	Ontario Air Contaminants Benchmarks List	Odour	0.8	0.0002	0.00001%	0.04%
Ethylbenzene	24 hr	1,000	Ontario Ambient Air Quality Criteria	Health	0.2	0.00004	0.00000%	0.02%
Xylene	10 min	3,000	Ontario Air Contaminants Benchmarks List	Odour	2.8	0.001	0.00003%	0.09%
Xylene	24 hr	730	Ontario Ambient Air Quality Criteria	Health	0.7	0.0003	0.00003%	0.09%
Benzo(a)pyrene	24 hr	0.00005	Ontario Ambient Air Quality Criteria	Health	0.00003	0.00000003	0.07%	67%
Benzo	Annual	0.00001	Ontario Ambient Air Quality Criteria	Health	0.00002	0.00000001	0.10%	>100%
DPM	24 hr	Not applicable	Not applicable	Not applicable	0.6	0.001	Not applicable	Not applicable
DPM	Annual	Not applicable	Not applicable	Not applicable	0.4	0.0004	Not applicable	Not applicable
Dustfall	30-day	7	Ontario Ambient Air Quality Criteria	Soiling	Not applicable	1.6	23.5%	Not applicable
Dustfall	Annual	4.6	Ontario Ambient Air Quality Criteria	Soiling	Not applicable	6.3	>100%	Not applicable

9.5.4.1.4.2 Mitigation and Enhancement Measures

Development of a best management plan for fugitive dust prior to operation phase of Community Access Road. Examples of best management practices that may be included are:

- Implement watering or application of Ontario Ministry of Transportation approved dust suppressants that are environmentally friendly; and
- Keep vegetation such as grasses shrubs and trees along the highway to enhance gravitational deposition of particles and natural windbreaks. Specifics to this are documented in the Rehabilitation Plan.

Consideration of input gathered through other technical monitoring programs specific to potential air quality concerns (in other words, potential dust deposition on vegetation) is completed and evaluated for consideration of future mitigation or monitoring options.

9.5.4.1.4.3 Predicted Residual Effects

Traffic volume and vehicle fleet composition vary between the north-south segment and Community segment resulting in different residual effects characterization between the road networks. The north-south segment towards the Ring of Fire will have seven times higher traffic volume than the east-west segment. The majority of traffic on the north-south segment towards the Ring of Fire will be heavy trucks and the majority of traffic on the east-west segment to Marten Falls community will be auto traffic.

The majority of Community Access Road spatial and geographic extent where potential air quality impacts may be expected are in areas where prolonged human presence is not anticipated. Effects characterization presented in this report reflects that of a worst-case predicted impact condition. The maximum vehicular traffic volume Projected on the road is anticipated to occur in 2046. This worst-case operations condition was used to characterize residual effects as well as determine significance.

Sensitive receptors considered as part of this significance assessment included those where human presence is expected for a potentially long duration in time. In the event that humans are not at sensitive receptor locations for periods of time less than indicator compound specific criteria averaging periods the significance of residual effects is reduced. For example, sensitive receptor exceedances to annual Total Suspended Particulate criteria may not occur if human presence at a particular receptor is limited to periods of less than one year at a time.

The dispersion modelling assessment was prepared using conservative emission rates and modelling parameters to present a worst-case impact predicted result. The

likelihood for residual effects were considered probable for indicator compounds assessed with annual averaging periods. The residual effects presented for annual averaging periods is less likely to be impacted by anomalous meteorological conditions and worst-case activity operations hours. For indicator compounds assessed with shorter averaging periods the likelihood for residual effects was determined to be possible to probable.

Uncertainty of receptor characteristics, such as frequency of human presence at receptor locations are also present within this assessment. Sensitive receptors considered as part of this significance assessment included those where human presence is expected for a potentially long duration in time. Unknown details of human presence at sensitive receptor locations adds to uncertainty in the residual impact assessment.

Prediction confidence of effects was determined to be moderate. Representative baseline data was known for receptor locations, potential for Project related effects are mostly understood, and the level of uncertainty associated with receptor data or Project conditions is moderate.

Residual effects were generally considered as significant if the residual effect was assessed at a high magnitude with potential residual impacts occurring at sensitive receptors, at either a frequent occurrence or in long term duration with irreversible effects. As operations phases of Community Access Road are not planned to end all residual effects are considered irreversible. Residual effects from operation that were classified to have a high magnitude were determined to be significant.

9.5.4.1.5 Summary of Residual Effects

Table 9.5-19 provides a summary of the potential effects for air quality, mitigation measures, and residual effects. Detailed information is included in **Appendix S**.

Table 9.5-19: Summary of Residual Effects for Atmospheric Environment

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Air Quality**	• Quarry Blasing	• Construction	• Nitrogen dioxide - Quarry Blasting	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: High • Direction: Negative • Geographic Extent: Not Applicable • Duration: Short-Term • Frequency: Infrequent • Reversibility: Reversible • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Air Quality**	• Quarry Aggregate Operations	• Construction	• Nitrogen dioxide - Quarry Aggregate Operations	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible	• Residual changes from air quality	• Context: Ecological, Social • Magnitude: High • Direction: Negative • Geographic Extent: Not Applicable • Duration: Short-Term • Frequency: Continuous • Reversibility: Reversible • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				– Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.		
• **Air Quality**	• Burning / Clearing	• Construction	• Nitrogen dioxide - Burning / Clearing	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Low • Direction: Negative • Geographic Extent: 4,551 metres • Duration: Short-Term • Frequency: Infrequent • Reversibility: Reversible • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Air Quality**	• Bridge Building	• Construction	• Nitrogen Dioxide – Bridge Building	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Low • Direction: Negative • Geographic Extent: 2,368 metres • Duration: Short-Term • Frequency: Continuous • Reversibility: Reversible • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct •

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
				– Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.		
• **Air Quality**	• Blasting or burning	• Construction	• Nitrogen Dioxide - Blasting or Burning	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Infrequent • Reversibility: Reversible • Probability: Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct •

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Air Quality**	• Bridge Building, Road Construction, Access Road or Aggregate Operations	• Construction	• Nitrogen dioxide - Bridge Building, Road Construction, Access Road or Aggregate Operations	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Continuous • Reversibility: Reversible • Probability: Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Air Quality**	• Burning	• Construction	• Total Suspended Particulates - Burning	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: High • Direction: Negative • Geographic Extent: 529 metres • Duration: Short-Term • Frequency: Infrequent • Reversibility: Reversible • Probability: Possible to Probably • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Air Quality**	• Road Construction	• Construction	• Total Suspended Particulates - Road Construction	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: High • Direction: Negative • Geographic Extent: 355 metres • Duration: Short-Term • Frequency: Continuous • Reversibility: Reversible • Probability: Possible to Probably • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Air Quality**	• Blasting or Burning	• Construction	• Total Suspended Particulates - Blasting or Burning	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Infrequent • Reversibility: Reversible • Probability: Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Air Quality**	• Bridge Building, Road Construction, Access Road or Aggregate Operations	• Construction	• Total Suspended Particulates - Bridge Building, Road Construction, Access Road or Aggregate Operations	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Medium • Direction: Negative • Geographic Extent: 174 metres • Duration: Short-Term • Frequency: Continuous • Reversibility: Reversible • Probability: Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct •
• **Air Quality**	• Burning	• Construction	• Particulate Matter 10 Micrometres or Less in Diameter - Burning	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Hight • Direction: Negative • Geographic Extent: 1099 metres • Duration: Short-Term • Frequency: Infrequent • Reversibility: Reversible • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Air Quality**	• Road Construction	• Construction	• Particulate Matter 10 Micrometres or Less in Diameter - Road Construction	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: High • Direction: Negative • Geographic Extent: 439 metres • Duration: Short-Term • Frequency: Continuous • Reversibility: Reversible • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct •
• **Air Quality**	• Burning	• Construction	• Particulate Matter 2.5 Micrometres or Less in Diameter - Burning	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: High • Direction: Negative • Geographic Extent: 1,030 metres • Duration: Short-Term • Frequency: Infrequent • Reversibility: Reversible • Probability: Possible to Probably • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Air Quality**	• Road Construction	• Construction	• Particulate Matter 2.5 Micrometres or Less in Diameter - Road Construction	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: High • Direction: Negative • Geographic Extent: 440 metres • Duration: Short-Term • Frequency: Continuous • Reversibility: Reversible • Probability: Possible to Probably • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct •
• **Air Quality**	• Blasting or Burning	• Construction	• Particulate Matter 2.5 Micrometres or Less in Diameter - Blasting or Burning	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Infrequent • Reversibility: Reversible • Probability: Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Air Quality**	• Bridge Building, Road Construction, Access Road or Aggregate Operations	• Construction	• Particulate Matter 2.5 Micrometres or Less in Diameter - Bridge Building, Road Construction, Access Road or Aggregate Operations	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Continuous • Reversibility: Reversible • Probability: Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Air Quality**	• Quarry Blasting	• Construction	• Sulphur Dioxide - Quarry Blasting	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: High • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Infrequent • Reversibility: Reversible • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Air Quality**	• Bridge Building, Road Construction, Access Road or Aggregate Operations	• Construction	• Sulphur Dioxide - Bridge Building, Road Construction, Access Road or Aggregate Operations	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Low • Direction: Negative • Geographic Extent: 350 metres • Duration: Short-Term • Frequency: Continuous • Reversibility: Reversible • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct •
• **Air Quality**	• Blasting	• Construction	• Sulphur Dioxide - Blasting	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: High • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Infrequent • Reversibility: Reversible • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Air Quality**	• Bridge Building	• Construction	• Sulphur Dioxide - Bridge Building	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Low • Direction: Negative • Geographic Extent: 19 metres • Duration: Short-Term • Frequency: Continuous • Reversibility: Reversible • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Air Quality**	• Blasting	• Construction	• Sulphur Dioxide - Blasting	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecology, Social • Magnitude: Low • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Infrequent • Reversibility: Reversible • Probability: Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct •

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Air Quality**	• Access Road	• Construction	• Sulphur Dioxide -, Access Road	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Continuous • Reversibility: Reversible • Probability: Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct •
• **Air Quality**	• Blasting	• Construction	• Carbon Monoxide - Blasting	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: High • Direction: Negative • Geographic Extent: 1,458 metres • Duration: Short-Term • Frequency: Infrequent • Reversibility: Reversible • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Air Quality**	• Bridge Building	• Construction	• Carbon Monoxide - Bridge Building	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Low • Direction: Negative • Geographic Extent: 85 metres • Duration: Short-Term • Frequency: Continuous • Reversibility: Reversible • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Air Quality**	• Blasting	• Construction	• Carbon Monoxide - Blasting	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: High • Direction: Negative • Geographic Extent: 699 metres • Duration: Short-Term • Frequency: Infrequent • Reversibility: Reversible • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Air Quality**	• Bridge Building, Road Construction, Access Road or Aggregate Operations	• Construction	• Carbon Monoxide - Bridge Building, Road Construction, Access Road or Aggregate Operations	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Continuous • Reversibility: Reversible • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Air Quality**	• Blasting, Burning	• Construction	• Acrolein – Blasting, Burning	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Infrequent • Reversibility: Reversable • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct •

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Air Quality**	• Bridge Building	• Construction	• Acrolein - Bridge Building	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Low • Direction: Negative • Geographic Extent: 2,508 metres • Duration: Short-Term • Frequency: Continuous • Reversibility: Reversable • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Air Quality**	• Blasting, Burning	• Construction	• Acrolein - Blasting, Burning	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Infrequent • Reversibility: Reversable • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **co**	• Bridge Building	• Construction	• Acrolein - Bridge Building	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual change to air quality	• Context: Ecological, Social • Magnitude: Low • Direction: Negative • Geographic Extent: 312 metres • Duration: Short-Term • Frequency: Continuous • Reversibility: Reversable • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Air Quality**	• Blasting, Burning	• Construction	• Acetaldehyde - Blasting, Burning	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Infrequent • Reversibility: Reversable • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Air Quality**	• Bridge Building, Road Construction, Access Road or Aggregate Operations	• Construction	• Acetaldehyde - Bridge Building, Road Construction, Access Road or Aggregate Operations	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Continuous • Reversibility: Reversable • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Air Quality**	• Blasting, Burning	• Construction	• Acetaldehyde - Blasting, Burning	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Infrequent • Reversibility: Reversable • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Air Quality**	• Bridge Building	• Construction	• Acetaldehyde - Bridge Building	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Low • Direction: Negative • Geographic Extent: 6 metres • Duration: Short-Term • Frequency: Continuous • Reversibility: Reversable • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Air Quality**	• Blasting, Burning	• Construction	• Benzene - Blasting, Burning	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Infrequent • Reversibility: Reversible • Probability: Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Air Quality**	• Bridge Building, Road Construction, Access Road or Aggregate Operations	• Construction	• Benzene - Bridge Building, Road Construction, Access Road or Aggregate Operations	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Continuous • Reversibility: Reversible • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Air Quality**	• Blasting, Burning	• Construction	• Benzene - Blasting, Burning	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Infrequent • Reversibility: Reversible • Probability: Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Air Quality**	• Bridge Building, Road Construction, Access Road or Aggregate Operations	• Construction	• Benzene - Bridge Building, Road Construction, Access Road or Aggregate Operations	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Continuous • Reversibility: Reversible • Probability: Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Air Quality**	• Blasting, Burning	• Construction	• Formaldehyde - Blasting, Burning	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual change to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Infrequent • Reversibility: Reversable • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Air Quality**	• Bridge Building, Road Construction, Access Road or Aggregate Operations	• Construction	• Formaldehyde - Bridge Building, Road Construction, Access Road or Aggregate Operations	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Continuous • Reversibility: Reversable • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Air Quality**	• Blasting, Burning	• Construction	• 1,3-Butadiene - Blasting, Burning	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Infrequent • Reversibility: Reversable • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Air Quality**	• Bridge Building, Road Construction, Access Road or Aggregate Operations	• Construction	• 1,3-Butadiene - Bridge Building, Road Construction, Access Road or Aggregate Operations	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Continuous • Reversibility: Reversable • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Air Quality**	• Blasting, Burning	• Construction	• 1,3-Butadiene - Blasting, Burning	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Infrequent • Reversibility: Reversable • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Air Quality**	• Bridge Building, Road Construction, Access Road or Aggregate Operations	• Construction	• 1,3-Butadiene - Bridge Building, Road Construction, Access Road or Aggregate Operations	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Continuous • Reversibility: Reversable • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Air Quality**	• Blasting, Burning	• Construction	• Toluene - Blasting, Burning	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Infrequent • Reversibility: Reversable • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Air Quality**	• Bridge Building	• Construction	• Toluene - Bridge Building	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Low • Direction: Negative • Geographic Extent: 51 metres • Duration: Short-Term • Frequency: Continuous • Reversibility: Reversable • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Air Quality**	• Burning	• Construction	• Ethylbenzene - Burning	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Low • Direction: Negative • Geographic Extent: 2,190 metres • Duration: Short-Term • Frequency: Infrequent • Reversibility: Reversable • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Air Quality**	• Bridge Building, Road Construction, Access Road or Aggregate Operations	• Construction	• Ethylbenzene - Bridge Building, Road Construction, Access Road or Aggregate Operations	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Continuous • Reversibility: Reversable • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Air Quality**	• Blasting, Burning	• Construction	• Xylene - Blasting, Burning	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Infrequent • Reversibility: Reversable • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Air Quality**	• Bridge Building	• Construction	• Xylene – Bridge Building	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Low • Direction: Negative • Geographic Extent: 29 metres • Duration: Short-Term • Frequency: Continuous • Reversibility: Reversable • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Air Quality**	• Blasting, Burning	• Construction	• Benzo(a)Pyrene - Blasting, Burning	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Infrequent • Reversibility: Reversable • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Air Quality**	• Bridge Building	• Construction	• Benzo(a)Pyrene - Bridge Building	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: High • Direction: Negative • Geographic Extent: 6 metres • Duration: Short-Term • Frequency: Continuous • Reversibility: Reversable • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Air Quality**	• Blasting, Burning	• Construction	• Benzo(a)Pyrene - Blasting, Burning	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: Local Study Area • Duration: Short-Term • Frequency: Infrequent • Reversibility: Reversable • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Air Quality**	• Bridge Building	• Construction	• Benzo(a)Pyrene - Bridge Building	• Development of a construction best management practice plan as well as a fugitive dust management plan prior to construction. Examples of best management practices that may be included are: – Implement watering during fugitive dust-generating activities such as drilling and material handling – Limit vehicle speed, where feasible – Strategic haul planning to reduce overall number of haul trips required for aggregate material demands. Consider sourcing material from the closest available material transfer points – Where possible, reduce the quantity of material that is either burned or chipped (in other words, consider salvageable material such as salable lumber) – When burning is required, consider avoiding periods where meteorological conditions (for example wind speed) that may result in smoke impacting sensitive receptor locations – Maintain equipment as per manufacturing specifications – Implement anti-idling policies or procedures to reduce total vehicle idling times – Implement blasting mitigation (for example charge size) in quarries to minimize potential effects – Use explosives only if alternate methods of excavation to remove materials for foundation systems and roads are not feasible – Prepare a Blasting and Communication Management Plan that is in accordance with Ontario Provincial Standard Specification General Specifications for the Use of Explosives (Ontario Provincial Standard Specifications, 2014) and describes specific measures that would be implemented if blasting is required. • Development of a construction monitoring plan. This plan may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude: Negligible • Direction: Negative • Geographic Extent: 30 metres • Duration: Short-Term • Frequency: Continuous • Reversibility: Reversable • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Air Quality**	• Tailpipe emissions of diesel-powered equipment	• Operations	• Nitrogen Dioxide	• Development of a Best Management Plan for fugitive dust prior to operation phase of Community Access Road. Examples of best management practices that may be included are: – Implement watering or application of Ontario Ministry of Transportation approved dust suppressants that are environmentally friendly; and – Keep vegetation such as grasses shrubs and trees along the highway to enhance gravitational deposition of particles and natural windbreaks. Specifics to this are documented in the Rehabilitation Plan. – Consideration of input gathered through other technical monitoring programs specific to potential air quality concerns (in other words, potential dust deposition on vegetation) is completed and evaluated for consideration of future mitigation or monitoring options.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude North-South Road Segment: Low • Magnitude Community Road Segment: Negligible • Direction: Negative • Geographic Extent North-South Road Segment: 700 metres • Geographic Extent Community Road Segment: Local Study Area • Duration: Long-Term • Frequency: Continuous • Reversibility: Irreversible • Probability: Possible • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Air Quality**	• Tailpipe emissions of diesel-powered equipment	• Operations	• Nitrogen Dioxide	• Development of a Best Management Plan for fugitive dust prior to operation phase of Community Access Road. Examples of best management practices that may be included are: – Implement watering or application of Ontario Ministry of Transportation approved dust suppressants that are environmentally friendly; and – Keep vegetation such as grasses shrubs and trees along the highway to enhance gravitational deposition of particles and natural windbreaks. Specifics to this are documented in the Rehabilitation Plan. • Consideration of input gathered through other technical monitoring programs specific to potential air quality concerns (in other words, potential dust deposition on vegetation) is completed and evaluated for consideration of future mitigation or monitoring options.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude North-South Road Segment: Low • Magnitude Community Road Segment: Negligible • Direction: Negative • Geographic Extent North-South Road Segment: 34 metres • Geographic Extent Community Road Segment: Local Study Area • Duration: Long-Term • Frequency: Continuous • Reversibility: Irreversible • Probability: Possible to Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Air Quality**	• Tailpipe emissions of diesel-powered equipment	• Operations	• Nitrogen Dioxide	• Development of a Best Management Plan for fugitive dust prior to operation phase of Community Access Road. Examples of best management practices that may be included are: – Implement watering or application of Ontario Ministry of Transportation approved dust suppressants that are environmentally friendly; and – Keep vegetation such as grasses shrubs and trees along the highway to enhance gravitational deposition of particles and natural windbreaks. Specifics to this are documented in the Rehabilitation Plan. • Consideration of input gathered through other technical monitoring programs specific to potential air quality concerns (in other words, potential dust deposition on vegetation) is completed and evaluated for consideration of future mitigation or monitoring options.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude North-South Road Segment: Low • Magnitude Community Road Segment: Negligible • Direction: Negative • Geographic Extent North-South Road Segment: 38 metres • Geographic Extent North-South Road Segment: Local Study Area • Duration: Long-Term • Frequency: Continuous • Reversibility: Irreversible • Probability: Probable • Significance: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Air Quality**	• Tailpipe emissions of diesel-powered equipment	• Operations	• Particulate Matter 2.5 micrometres or less in diameter	• Development of a Best Management Plan for fugitive dust prior to operation phase of Community Access Road. Examples of best management practices that may be included are: – Implement watering or application of Ontario Ministry of Transportation approved dust suppressants that are environmentally friendly; and – Keep vegetation such as grasses shrubs and trees along the highway to enhance gravitational deposition of particles and natural windbreaks. Specifics to this are documented in the Rehabilitation Plan. • Consideration of input gathered through other technical monitoring programs specific to potential air quality concerns (in other words, potential dust deposition on vegetation) is completed and evaluated for consideration of future mitigation or monitoring options.	• Residual change to air quality	• Context: Ecological, Social • Magnitude North-South Road Segment: High • Magnitude Community Road Segment: Low • Direction: Negative • Geographic Extent North-South Road Segment: 207 metres • Geographic Extent Community Road Segment: 92 metres • Duration: Long-Term • Frequency: Continuous • Reversibility: Irreversible • Probability: Possible to Probable

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
						• Significance North-South Road Segment: Significant • Significance Community Road Segment: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Air Quality**	• Tailpipe emissions of diesel-powered equipment	• Operations	• Particulate Matter 2.5 micrometres or less in diameter	• Development of a Best Management Plan for fugitive dust prior to operation phase of Community Access Road. Examples of best management practices that may be included are: – Implement watering or application of Ontario Ministry of Transportation approved dust suppressants that are environmentally friendly; and – Keep vegetation such as grasses shrubs and trees along the highway to enhance gravitational deposition of particles and natural windbreaks. Specifics to this are documented in the Rehabilitation Plan. • Consideration of input gathered through other technical monitoring programs specific to potential air quality concerns (in other words, potential dust deposition on vegetation) is completed and evaluated for consideration of future mitigation or monitoring options.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude North-South Road Segment: High • Magnitude Community Road Segment: Negligible • Direction: Negative • Geographic Extent North-South Road Segment: 414 metres • Geographic Extent Community Road Segment: Local Study Area • Duration: Long-Term • Frequency: Continuous • Reversibility: Irreversible • Probability: Probable • Significance North-South Road Segment: Significant • Significance Community Road Segment: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Air Quality**	• Tailpipe emissions of diesel-powered equipment	• Operations	• Particulate Matter 10 micrometres or less in diameter	• Development of a Best Management Plan for fugitive dust prior to operation phase of Community Access Road. Examples of best management practices that may be included are: – Implement watering or application of Ontario Ministry of Transportation approved dust suppressants that are environmentally friendly; and – Keep vegetation such as grasses shrubs and trees along the highway to enhance gravitational deposition of particles and natural windbreaks. Specifics to this are documented in the Rehabilitation Plan. • Consideration of input gathered through other technical monitoring programs specific to potential air quality concerns (in other words, potential dust deposition on vegetation) is completed and evaluated for consideration of future mitigation or monitoring options.	• Residual change to air quality	• Context: Ecological, Social • Magnitude North-South Road Segment: High • Magnitude Community Road Segment: High • Direction: Negative • Geographic Extent North-South Road Segment: 2,987 metres • Geographic Extent Community Road Segment: 374 metres • Duration: Long-Term • Frequency: Continuous • Reversibility: Irreversible • Probability: Possible to Probable • Significance North-South Road Segment: Significant • Significance Community Road Segment: Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Air Quality**	• Tailpipe emissions of diesel-powered equipment	• Operations	• Total Suspended Particulates	• Development of a Best Management Plan for fugitive dust prior to operation phase of Community Access Road. Examples of best management practices that may be included are: – Implement watering or application of Ontario Ministry of Transportation approved dust suppressants that are environmentally friendly; and – Keep vegetation such as grasses shrubs and trees along the highway to enhance gravitational deposition of particles and natural windbreaks. Specifics to this are documented in the Rehabilitation Plan. • Consideration of input gathered through other technical monitoring programs specific to potential air quality concerns (in other words, potential dust deposition on vegetation) is completed and evaluated for consideration of future mitigation or monitoring options.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude North-South Road Segment: High • Magnitude Community Road Segment: High • Direction: Negative • Geographic Extent North-South Road Segment: Local Study Area • Geographic Extent Community Road Segment: 1,001 metres • Duration: Long-Term • Frequency: Continuous • Reversibility: Irreversible • Probability: Possible to Probable • Significance North-South Road Segment: Significant • Significance Community Road Segment: Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct
• **Air Quality**	• Tailpipe emissions of diesel-powered equipment	• Operations	• Total Suspended Particulates	• Development of a Best Management Plan for fugitive dust prior to operation phase of Community Access Road. Examples of best management practices that may be included are: – Implement watering or application of Ontario Ministry of Transportation approved dust suppressants that are environmentally friendly; and – Keep vegetation such as grasses shrubs and trees along the highway to enhance gravitational deposition of particles and natural windbreaks. Specifics to this are documented in the Rehabilitation Plan. • Consideration of input gathered through other technical monitoring programs specific to potential air quality concerns (such as, potential dust deposition on vegetation) is completed and evaluated for consideration of future mitigation or monitoring options.	• Residual changes to air quality	• Context: Ecological, Social • Magnitude North-South Road Segment: High • Magnitude Community Road Segment: Low • Direction: Negative • Geographic Extent North-South Road Segment: Local Study Area • Geographic Extent Community Road Segment: 639 metres • Duration: Long-Term • Frequency: Continuous • Reversibility: Irreversible • Probability: Probable • Significance North-South Road Segment: Significant • Significance Community Road Segment: Not Significant • Prediction Confidence: Moderate • Direct / Indirect: Direct

9.5.4.2 Greenhouse Gases

9.5.4.2.1 Project-Environment Interactions

As a component of the effects assessment, the Project activities were reviewed to find potential environmental interactions. These interactions were then assessed for potential effects (**Table 9.5-20**).

Table 9.5-20: Project-Environment Interactions - Greenhouse Gases

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• **Construction and Operation**	• All Project Activities	• Greenhouse Gases	• Quantification of Greenhouse Gas emissions (carbon dioxide, methane, nitrous oxide) expressed as carbon dioxide equivalent	• Change in Greenhouse Gas emissions expressed as tonnes of (carbon dioxide equivalent

9.5.4.2.2 Discipline-Specific Characteristics

In support of the residual effects characteristics described in **Section 6.7.3**, **Table 6-1**, the following greenhouse gases definitions apply to the effects assessment.

Ecological Context

For the greenhouse gas assessment, ecological context is directly related to changes in greenhouse gas emissions.

Magnitude

The magnitude of the Community Access Road's greenhouse gas contributions from Construction and Operations are assessed through comparison to the total provincial transportation emissions (in other words, road transportation sector). As per the most recent National Inventory Report (Environment and Climate Change Canada, 2025), a total of 40,907 kilotonnes of carbon dioxide equivalent was emitted from Ontario's road transportation sector, and a total of 156,994 kilotonnes of carbon dioxide equivalent was emitted from all Ontario sectors which exclude emissions from land use changes. **Table 9.5-21** provides definitions of greenhouse gases magnitude.

Table 9.5-21: Greenhouse Gases Magnitude Definition

Magnitude Level	Definition	Rationale
• **Negligible**	• Up to 0.1 percent of the Provincial Road Transportation Greenhouse Gas Totals • Under 41 kilotonnes of annual emissions thresholds (carbon dioxide equivalent)	• Releases of greenhouse gases and their accumulative in the atmosphere influence regional, national, and global climate and may affect emission reduction targets for greenhouse gases that have been set or are being developed federally and provincially. The magnitude has therefore been established as a percent contribution to provincial totals to assess the significance of Project emissions and hence potential effect on provincial reduction targets that may exist.
• **Low**	• 0.1 percent to 0.5 percent of Provincial Road Transportation Greenhouse Gas Totals • 41 to 205 kilotonnes of annual emissions thresholds (carbon dioxide equivalent)	• Same as previous
• **Medium**	• 0.5 percent to 1 percent of Provincial Road Transportation Greenhouse Gas Totals • 205 to 408 kilotonnes of annual emissions thresholds (carbon dioxide equivalent)	• Same as previous
• **High**	• >1 percent of Provincial Road Transportation Greenhouse Gas Totals • Above 409 kilotonnes (carbon dioxide equivalent)	• Same as previous

9.5.4.2.3 Residual Effects – Construction Phase

9.5.4.2.3.1 Potential Effects

The potential effects of the Project's construction on greenhouse gases include direct emissions from construction mobile equipment, blasting operations, and land use changes.

Annual emissions for each source category were estimated for a typical construction year (in other words, 40 kilometres of road built in a year). Construction mobile equipment, include nonroad construction machinery and on road construction vehicles (for example, road trucks), are estimated to generate approximately 18 kilotonnes of

carbon dioxide equivalent per year and 81 kilotonnes of carbon dioxide equivalent for the entire construction phase.

Quarry and road blasting are expected to generate approximately 0.4 kilotonnes of carbon dioxide equivalent per year and 1.8 kilotonnes of carbon dioxide equivalent of the entire construction phase.

During a typical construction year, the Project's annual Greenhous Gas emissions, without land use changes, are estimated to be approximately 19 kilotonnes of carbon dioxide equivalent.

9.5.4.2.3.2 Mitigation and Enhancement Measures

Best management practices that are typically employed during construction activity can be implemented to help reduce overall Project impacts on the surrounding environment during periods of construction.

The Ontario Ministry of Transportation identifies potential mitigation measures that may be taken, if feasible, for transportation-related projects in the Ontario Ministry of Transportation Environmental Guide for Assessing and Mitigation the Air Quality Impacts and Greenhouse Gas Emissions for Provincial Transportation projects (Ontario Ministry of Transportation, 2020).

It is recommended to develop a construction management plan after the final design and before construction begins. This plan should detail the selected mitigation measures with respect to greenhouse gas emissions, allowing for a more refined and efficient approach to controls, costing, and Project scheduling. The specifics of the mitigation measures and best management practices will be clearer during the detail design and construction submittal process.

Below is a list of examples of these practices and measures. It is suggested that mitigation measures incorporate Ontario Ministry of Transportation recommendations as well as construction industry best practices. Where feasible, the following mitigation measures are suggested to help reduce overall residual effects. Additional, a construction monitoring plan should be created during the final design and construction submittal periods to confirm best management practices are being followed.

- Implementing anti-idling policies or procedures to reduce total vehicle idling times
- Planning strategic haul plans to reduce the overall number of haul trips required for aggregate material demands by considering sourcing material from the closest available material transfer points
- Maintaining equipment as per manufacturer specifications

- Using fuel-efficient vehicles with low emissions
- Developing a construction monitoring plan that may be used to validate that best management practices are being implemented and that mitigation actions taken are effective. Where mitigation is not providing a reduction to overall impacts, mitigation options should be re-assessed.
- Where possible / feasible, considerations may be taken during route planning to avoid high-carbon stock areas such as dense forests. Although reforestation and afforestation of the land areas beyond the Right-of-Way are not planned, natural growth of vegetation (for example, grasses) are anticipated after the construction.
- Preserving and reusing the topsoil removed during construction helps to preserve the existing soil structure and thus reduces the loss of carbon in soils. Using advanced construction techniques and processes also reduces soil carbon loss. For instance, the Project will be using a “floating road” technique for road construction on wetlands which reduces the need for extensive soil excavation and disturbance.

9.5.4.2.3.3 Predicted Residual Effects

The Project’s annual construction emissions, are below 0.5 percent of Ontario’s road construction total greenhouse gas emissions. Greenhouse gas emissions from construction are considered to be of a negligible magnitude. During the assessment of annual greenhouse gas emissions, emission-generating activities were assumed to occur at a continuous frequency throughout construction and are considered to be irreversible. The likelihood of greenhouse gas residual effects was considered to be probably and the prediction confidence was ranks as low to moderate.

9.5.4.2.4 Residual Effects – Operations Phase

The direct greenhouse gas emissions during the Operation phase of the Project include emissions from the future road traffic and land use change (in other words, emissions resulting from carbon loss in organic soils distributed over a 20-year period).

The road traffic on the proposed Community Access Road is anticipated to generate approximately 27 kilotonnes of carbon dioxide equivalent per year and a total of 401 kilotonnes of carbon dioxide equivalent for the entire 30-year assessment period. A 20-year assessment period is recommended in the Ontario Ministry of Transportation Guideline for Assessing for Air Quality and Greenhouse Gases for Ontario Transportation Projects (Ministry of Transportation, 2020). The 20-year assessment period includes approximately 5 years of construction and 15 years of operation.

Greenhouse gas emission estimates for the future road traffic were conservatively based on the projected peak traffic volume on the proposed Community Access Road in the 2046 year (AECOM, 2024). The actual greenhouse gas emissions each year are expected to very depending on factors such as the actual traffic volume in the year. Improvements in vehicle emission controls and fuel efficiencies may also lead to variations in reported annual greenhouse gas emissions.

The Project's operation is expected to reduce greenhouse gas emissions from existing air travel and winter road travel. As per the Strategic Assessment of Climate Change Technical Guide, the reduced greenhouse gas emissions due to the shift of travel forms can be accounted as avoided domestic emissions in calculating the Project's net greenhouse gas emissions.

The Project's operation is expected to reduce approximately 0.02 kilotonnes of carbon dioxide equivalent per year and a total of 0.3 kilotonnes of carbon dioxide equivalent for the assessment period for Project operation. The low greenhouse gas emissions from the existing winter travel are attributed to low traffic volume and road accessibility.

Note that the existing greenhouse gas emissions from winter road travel were estimated based on the current traffic volume and are assumed to remain constant for the no-build scenario. Vehicular travel on the existing road is anticipated to be negligible once the Community Access Road becomes operational and therefore the greenhouse gas emissions will be zero from the operation year of the Project.

The Project is anticipated to partially displace existing air travel with road vehicle traffic and result in greenhouse gas reductions due to avoided air travel. However, the Project's effects on existing air travel are not quantitively assessed due to the limited information on existing flights and high uncertainties associated with estimates of avoided or increased air travel.

9.5.4.2.4.1 Mitigation and Enhancement Measures

The Project mitigation measures during operations to reduce greenhouse gas emissions are less in control of the Owner / Operator and more directly related to the road user and regional governing body. There are a number of federal and provincial actions in place or proposed to reduce vehicle greenhouse gas emissions. The following regulations are outlined in the Ministry of Transportation Air Quality and Greenhouse Gas Guide (Ministry of Transportation, 2020), all of which aim to reduce vehicle related greenhouse gas emissions:

- The federal Passenger Automobile and Light Truck Greenhouse Gas Emissions Regulations (SOR/2010-201)

- Regulations Amending the Passenger Automobile and Light Truck Greenhouse Gas Emissions Regulations (SOR/2014-207)
- Heavy-duty Vehicle and Engine Greenhouse Gas Emission Regulations (SOR/2013-24)
- Regulations Amending the Heavy-duty Vehicle and Engine Greenhouse Gas Emission Regulations and Other Regulations Made Under the Canadian *Environmental Protection Act*, 1999 (SOR/2018-98)

It is expected that as time progresses and more fuel-efficient vehicles are used on the road, annual greenhouse gas emissions on a per-vehicle basis will decrease over the lifespan of the Project during the Operation phase.

9.5.4.2.4.2 Predicted Residual Effects

The Project's annual Operation emissions are below 0.1 percent of Ontario's road transportation total greenhouse gas emissions and is considered to be negligible in magnitude. greenhouse gas emissions are expected to have a long-term effect and continuously emitted from vehicular traffic and is considered irreversible. The likelihood is considered probable and the prediction confidence is considered moderate.

9.5.4.2.5 Potential Effects – Land Use Changes

Land use changes due to Project construction result in carbon stock changes and subsequent direct greenhouse gas emissions. The Project's construction is expected to convert different land uses (for example, forest land) into settlements (in other words, roads and bridges) and thus impact the carbon stocks and carbon sequestration capabilities (in other words carbon sink) of land uses within the Construction Disturbance Area. The change of carbon stocks for land uses within the Project Disturbance Area is assessed as an emission to the atmosphere as carbon dioxide. In addition, half of the wood in forest land will be, stockpiled and burned, resulting in releases of greenhouse gas emissions.

The land use changes resulting from the road construction are expected to generate approximately 277 kilotonnes of carbon dioxide equivalent per construction year and 17 kilotonnes of carbon dioxide equivalent per construction year and 17 kilotonnes of carbon dioxide equivalent per operation year due to the delayed, gradual loss of carbon stock in soil and subsequent carbon dioxide emissions. During the 20-year project assessment period, the land use changes due to road construction resulted in total greenhouse gas emissions of 1,485 kilotonnes of carbon dioxide equivalent.

The estimated losses of carbon storage in biomass, dead organic matter, and social organic matter for the entire Project period at 171 kilotonnes, 13 kilotonnes, and 94 kilotonnes, respectively. Following the Strategic Assessment of Climate Change Technical Guide, the losses of carbon stocks in carbon pools are treated as carbon dioxide emissions to the atmosphere, which resulted in total greenhouse gas emissions from 1,485 kilotonnes from land use change.

During a typical construction year, a total loss of 75 kilotonnes of carbon stocks are estimated from all carbon pools in both forest land and wetlands.

The land use changes due to Project construction also have potential effects on carbon sinks. The exiting land uses within the Construction Disturbance Area mainly include forest land and wetlands. The carbon sink of forest land is assumed zero as the forest within the Construction Disturbance Area have either reached or surpassed the age for the maximum carrying capacity. Wetlands within the Construction Disturbance Area are dominated by peatland classes such as Fen (33.$) and Swamp (63.8 percent) which act as sources of carbon emissions rather than carbon sinks. Overall, the existing land uses within the Construction Disturbance Area are estimated to release 1,646 tonnes of carbon annually.

The Project construction will change the existing land uses into settlements (in other words, road and bridges) which are assumed to have zero carbon sinks after the construction. Following the method for estimating carbon sink impact in the Strategic Assessment of Climate Change technical guide (Equation 5), the estimated carbon sink impact for the Project is an estimated lost potential to release about 165 kilotonnes of carbon into the atmosphere. From the carbon sink analysis perspective, the Project has positive impacts on carbon sinks as the disturbed land acted as a source of carbon emissions. However, the land use changes due to the Project's construction will cause a loss of carbon storage in carbon pools and result in subsequent greenhouse gas emissions to the atmosphere.

9.5.4.2.5.1 Mitigation and Enhancement Measures

Carbon loss due to land use change (for example, converting forest into roads) and subsequent effects on greenhouse gas changes are inevitable. Mitigation measures can be taken to preserve existing carbon stocks as much as possible but can not fully eliminate the residual effect.

Where feasible, considerations may be taken during route planning to avoid high-carbon stock areas such as dense forests. Although reforestation and afforestation of the land areas beyond the Right-of-Way are not planned, natural growth of vegetation (for example, grasses) are anticipated after the construction.

Preserving the reusing the topsoil removed during construction helps to preserve the existing soil structure and thus reduce the loss of carbon in soils. Using advanced construction techniques and processes also reduces soil carbon loss. For instance, the Project will be using a “floating road” technique for road construction on wetlands which reduces the need for extensive soil excavation disturbance.

9.5.4.2.5.2 Predicted Residual Effects

The Project’s maximum annual greenhouse gas emissions from land use changes account for approximately 0.18 percent of Ontario’s total. The magnitude of greenhouse gas emissions from land use changes is considered low (in other words, from 0.1 percent to 0.5 percent of Ontario’s total). The duration of greenhouse gas residual effects from land use changes is considered long-term and the frequency is considered as continuous. Land use changes are deemed irreversible. The likelihood associated with land use change was assesses as probable and the prediction confidence is assessed as low.

9.5.4.2.6 Summary of Residual Effects

Table 9.5-22 provide a summary of the greenhouse gases residual effects. Detailed information is included in **Appendix S**.

Table 9.5-22: Summary of Residual Effects for Greenhouse Gases

Discipline / Valued Component	Predicted Residual Effect	Context	Direct / Indirect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Likelihood / Probability of Occurrence	Significance	Prediction Confidence
• Greenhouse Gases	• Greenhouse Gas Emissions - Construction	• Change in Greenhouse Gas Emissions	• Direct	• Negative	• Negligible	• Sectoral	• Long Term	• Continuous	• Irreversible	• Probable	• Not Significant	• Low to Moderate
• Greenhouse Gases	• Greenhouse Gas Emissions - Operations	• Change in Greenhouse Gas Emissions	• Direct	• Negative	• Negligible	• Sectoral	• Long Term	• Continuous	• Irreversible	• Probable	• Not Significant	• Moderate
• Greenhouse Gases	• Greenhouse Gas Emissions - Land Use Change	• Change in Greenhouse Gas Emissions	• Direct	• Negative	• Low	• Regional	• Long Term	• Continuous	• Irreversible	• Probable	• Not Significant	• Low

9.5.5 Cultural Heritage and Archaeology

9.5.5.1 Project-Environment Interactions

As a component of the effects assessment, the Project activities for cultural heritage and archaeology were reviewed to find potential environmental interactions.

Table 9.5-23: Project-Environment Interactions

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• **Construction and Operation**	• Clearing and grubbing • Grading and excavation • Drainage installation • Bridge or culvert construction • Pits and quarries • Access roads	• Cultural Heritage and Archaeology	• Presence and integrity of known and previously unidentified archaeological sites	• Construction and operation of the Community Access Road may result in ground disturbance that could damage or destroy culturally significant sites or known or previously unidentified archaeological resources.

9.5.5.2 Discipline-Specific Characteristics

Several factors are considered when evaluating potential effects on identified cultural heritage and archaeological resources. These are outlined in a document set out by the Ministry of Citizenship and Multiculturalism and include:

- Magnitude: the amount of physical alteration or destruction which can be expected;
- Severity: the irreversibility or reversibility of an effect;
- Duration: the length of time an adverse effect persists;
- Frequency: the number of times an effect can be expected;
- Range: the spatial distribution, widespread or site-specific, of an adverse effect; and
- Diversity: the number of different kinds of activities to affect a heritage resource.

9.5.5.3 Potential Effects

The following **Table 9.5-24** summarizes direct and indirect impacts to the potential Mid-Albany Cultural Heritage Landscape and its potential Cultural Heritage attributes within the Local Study Area along the Preferred Route. These potential heritage attributes include identified Indigenous Knowledge areas, data points, and routes, in addition to provincial parks and the overall landscape. To assist in this process, data points were numbered and mapped along the Preferred Route. Mapped data from other Indigenous communities, including data points, areas, trails, or other features, are considered in the analysis below, but are not identified in the supplementary mapping due to confidential nature of the information and by request of the Indigenous communities.

Table 9.5-24: Preliminary Cultural Heritage Impact Assessment of the Construction Disturbance Area of the Preferred Route

Potential Cultural Heritage Landscape	Summary of Potential Heritage Attributes	Discussion of Impacts	Proposed Mitigation and Next Steps
Mid-Albany Cultural Heritage Landscape	• 9 General Harvest Areas • 50 Specific Harvest Areas	• Direct impacts are anticipated. – The Construction Disturbance Area of the Preferred Route is anticipated to directly overlap all 9 General Harvest Areas in addition to 14 specifically plotted Harvest Areas – Construction-related activities and / or the long-term use of the road may result in displacement of traplines and the fragmentation and / or degradation of terrestrial habitat. This would negatively affect the distribution of furbearing animals, birds, and ungulates, thus affecting the viability of traplines and hunting areas. – Construction-related activities and / or the long-term use of the road may result in the blockage or channelization of watercourses, changes to banks or riverbeds, and increased sedimentation as a result of excavation and / or dust. This would negatively affect the quality, connectivity, and quantity of aquatic habitat and the viability of fishing areas. • Indirect impacts are anticipated – Construction-related activities and the long-term use of the road may impact aquatic and terrestrial habitat beyond the immediate Construction Disturbance Area of the Preferred Route. There is considerable potential for indirect impacts to habitat, within and beyond the Local Study Area that will negatively affect the availability of furbearing animals, ungulates, and birds and negatively affecting hunting, trapping, and fishing areas that are within the Local Study Area, but not directly overlapped by the Construction Disturbance Area of the Preferred Route. – The construction of the road will provide new access to the region that may indirectly adversely affect Harvest Areas through habitat changes and / or greater land use by non-local people.	• Mitigation: – Where possible, avoid direct impact to potential heritage attributes of the cultural heritage landscape during the design and implementation of the Project. Refinements of the Preferred Route during the design, and land-use within the 100 metres Construction Disturbance Area during construction should be planned to avoid impacting known Harvest Areas, Habitation Areas, Cultural, Spiritual, and Sacred Areas, Travel Routes, and Provincial Parks. If avoidance of potential heritage attributes is not feasible, then further assessment of the impacts and mitigation is required. • Next Steps: – A Cultural Heritage Evaluation Report should be completed by a Qualified Person(s) to determine the Cultural Heritage Value or Interest of the potential cultural heritage landscape. – If the Project continues to impact the area and it is determined that the potential cultural heritage landscape meets Ontario Regulation 9/06 or Ontario Regulation 10/06, then further assessment of impacts and mitigation is required by completing a Heritage Impact Assessment.
Mid-Albany Cultural Heritage Landscape	• 34 Habitation Areas	• Direct impacts are anticipated. – The Construction Disturbance Area of the Preferred Route is anticipated to directly overlap 5 Habitation Areas in addition to the Marten Falls First Nation Reserve. – Potential direct impacts may include the demolition or removal of campground areas and / or temporary or permanent changes in land access at or around Habitation Areas. • Indirect impacts are anticipated – Indirect impacts beyond the Construction Disturbance Area of the Preferred Route may include temporary or permanent changes in access to Habitation Areas, including either inhibiting access or opening access to non-local people.	• Same as above
Mid-Albany Cultural Heritage Landscape	• 15 Cultural, Spiritual, and Sacred Areas and associated context	• Direct impacts are anticipated. – The Construction Disturbance Area of the Preferred Route is anticipated to directly overlap 6 Cultural, Spiritual, and Sacred Areas. – Potential direct impacts may include the demolition or removal of cultural sites, and temporary or permanent changes in access to culturally significant areas, either impeding local access or opening greater access to non-local people. • Indirect impacts are anticipated – Indirect impacts beyond the Construction Disturbance Area of the Preferred Route may include temporary or permanent changes to the surrounding landscape that alter the context of culturally important areas.	• Same as above

Potential Cultural Heritage Landscape	Summary of Potential Heritage Attributes	Discussion of Impacts	Proposed Mitigation and Next Steps
Mid-Albany Cultural Heritage Landscape	• 29 Land Routes • 4 Water Routes	• Direct impacts are anticipated. – The Construction Disturbance Area of the Preferred Route is anticipated to intersect 27 Travel Routes including 23 land and 4 water routes. – Potential direct impacts to land routes may include the destruction of trail segments, the temporary or permanent obstruction of trails, and long-term changes in rights of way and / or trail access. – Potential direct impacts to water routes may include new transportation infrastructure such as bridges, culverts, and embankments that change the configuration of riverbanks and partially or fully obstruct waterway navigability and / or portage sites on a temporary or permanent basis. • Indirect impacts are anticipated – Indirect impacts to land routes may include changes in access to trails, either impeding local access or opening greater access to non-local people. – Indirect impacts to water routes may include temporary or permanent changes to prevailing currents, and / or long-term changes in patterns of debris deposition and sedimentation, thus altering the navigability of waterways.	• Same as above
Mid-Albany Cultural Heritage Landscape	• 2 Provincial Parks	• Direct impacts are anticipated. – The Construction Disturbance Area of the Preferred Route is anticipated to transect the Albany River Provincial Park. – The Albany River Provincial Park is noted for its varied topography, remoteness, and water routes. The Project may result in direct impacts including, but not limited to, changes to the local topography including the destruction, removal, or alteration of landforms and / or grades, and the addition of a bridge over the Albany River, affecting the scenic quality and / or the navigability of the waterway. • Indirect impacts are anticipated. – The Construction Disturbance Area of the Preferred Route is anticipated to pass within approximately 1 kilometre of the Ogoki River Provincial Park. – The Ogoki River Provincial Park is noted for its natural features, water routes, recreational opportunities, remoteness, and scenic qualities. Indirect impacts may include alterations to the landscape within and around the parks, thus altering the scenic context. – Additionally, the Project may result in temporary or permanent changes in access to both parks, opening both to greater use by non-local people.	• Same as above

9.5.5.4 Summary of Potential Effects

Table 9.5-25 provides a summary of the potential effects for archaeology, mitigation measures, and residual effects. Detailed information is included in **Appendix R**.

Table 9.5-25:Summary of Project Effects for Cultural Heritage and Archaeology

Valued Component	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect
• **Cultural Heritage**	• Construction	• There were 101 data points identified with cultural heritage relevance within the Local Study Area of the Community Access Road of which 30 are anticipated to be overlapped and directly impacted by the Community Access Road. These points include 99 in Marten Falls data points, one Neskantaga First Nation data point, and one Aroland First Nation data point composed of: – 52 identified harvest areas, including thirty-six animal harvest areas, thirteen fish harvest areas, and three plant harvest areas; – 10 cultural, spiritual, and sacred areas; – 30 habitation areas; and – 9 travel routes. • The Preliminary Impact Assessment further identified that of the 101 data points, 30 are anticipated to be directly impacted by the Community Access Road, including: – 14 identified harvest areas, including eight animal harvest areas and six fish harvest areas; – 2 cultural, spiritual, and sacred areas; – 5 habitation areas; and – 9 travel routes. • It should be noted that the Indigenous Knowledge data points used in this study could be connected to one another and to the wider landscape. Therefore, the identification of data points anticipated to be directly impacted does not preclude impacts to other points within or near the Local Study Area, nor may they be readily confined to the Project footprint. • While direct or indirect impacts to data points may be assessed according to standard provincial criteria, those potential impacts are better understood as impacts to a cultural heritage landscape, rather than to individual data points.	• To address the probable slippage between direct and indirect impacts, potential impacts are best understood as impacts to cultural heritage landscapes, rather than to individual data points. It is recommended that any future reporting be organized as assessments of two cultural heritage landscapes; the Ogoki River and the Albany River. The reports should be thematically organized to include the cultural heritage themes associated with those rivers (harvest areas, habitation areas, cultural, spiritual, and sacred areas, and travel routes). Moreso than individual data points, assessing the Albany and Ogoki rivers for cultural heritage value or interest will provide the most accurate assessment of cultural heritage value and impacts of the Community Access Road. • For the cultural heritage landscapes and associated data points within the Local Study Area general mitigations measures should be developed and observed, including the following: – Continue to refine the Local Study Area to avoid direct adverse impacts to identified cultural heritage landscapes and associated data points, where possible. – Construction activities should be suitably planned and undertaken to avoid impacts, including but not limited to: – Informing construction crews of the location of known cultural heritage landscapes and associated data points. – Confining construction-related activities to the proposed right-of-way of the Community Access Road. – Establish a construction monitoring process which includes procedures and no-go zones and procedures to avoid impacts to the cultural heritage landscapes and associated data points. • Should there be changes to the Community Access Road, a qualified person(s) should assess whether they will affect the assessment of existing heritage conditions and preliminary impacts and provide advice on any required revisions to the recommendations in the Cultural Heritage Report (Appendix Q). • Cultural Heritage Evaluation Report on the Ogoki River. • Cultural Heritage Evaluation Report on the Albany River.	• -
• **Cultural Heritage**	• Operations	• At this time there are no identified potential effects for the operational or maintenance phase.	• At this time there are no identified potential effects for the operational or maintenance phase.	• -

Valued Component	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect
• **Archaeology**	• Construction	• As described in **Section 8.3.6.6**, two Stage 1 and one partial Stage 2 Archaeological Assessment were completed in the Local Study Area. The results of these studies found that additional archaeological work is required to identify potential effects, and future mitigations.	• To mitigate potential effect to archaeological resources the following mitigations are required: • Should an avoidance and protection strategy for the Caviar (EiIp-1) site be implemented during construction, it must include: – Placement of a temporary barrier around the site, including a 20-metre protective buffer of land surrounding the site; – Monitoring by a licensed consultant archaeologist for any construction activities that occur within 70 metres of the site; – The issuance of “no-go” instructions within the 20-metre buffer to all onsite construction personnel or others involved in the construction process (in other words, engineers, architects). Refer to Section 4.1.1 of the Standards and Guidelines for Consultant Archaeologists (Ontario Government of Ontario, 2011); – Illustration of the location of the area to be avoided on contract drawings, including explicit instructions to avoid the area; – The presence of a licensed archaeologist on site to inspect fence installation, inspection of the site by a licensed archaeologist after the completion of all soil-disturbing activities, and reporting of the effectiveness of the avoidance and protection strategy to the Ministry of Citizenship and Multiculturalism; and, – Should future repairs or improvements be required near the Caviar (EiIp-1) site or should changes to the Project area be required, archaeological monitoring by a licensed archaeologist will be required to help maintain that the No-Go zone remains in place and that the archaeological site is protected from construction or soil disturbance activities. • If impacts will be proposed to Caviar (EiIp-1), a Stage 3 AA is required. The Stage 3 AA for Caviar (EiIp-1) must include the hand excavation test unit methodology as outlined in Section 3.2 and Table 3.1 of the Standards and Guidelines for Consultant Archaeologists (Government of Ontario, 2011), to further test the nature and density of the site. Given that Caviar (EiIp-1) is primarily located on exposed bedrock, hand excavation covering the entire site may not be possible. Therefore, the Stage 3 AA would consist of site documentation and recording.	• A Cultural Heritage Evaluation Report will be completed prior to detail design. As per the approved Cultural Heritage Study Plan, a cultural heritage and archaeology effects assessment will be completed when detail design is complete.
• **Archaeology**	• Operations	• At this time there are no identified potential effects for the operational or maintenance phase.	• Not Applicable	• Not Applicable

9.5.6 Community Well-Being

9.5.6.1 Project-Environment Interactions

An analysis of Project-environment interactions for community well-being that are likely to have a potential effect is provided in **Table 9.5-26**.

Table 9.5-26: Project-Environment Interactions – Community Well-Being

Project Phases	Project Activities To Have Potential Effect on Community Well-being
• **Construction**	• Mobilization of Equipment and Supplies • Temporary Construction Staging Areas • Temporary Access Roads and Trails • Temporary Construction Camps • ROW Clearing and Grubbing • Brush and Timber Disposal • Pits and Quarries • Temporary Concrete Batch Plants / Trails and Staging Areas • Drilling / Blasting / Aggregate Production • Road Construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and Culvert Installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction Site Restoration • Pits and Quarries
• **Operations**	• Road Usage • Road Maintenance

9.5.6.2 Discipline-Specific Characteristics

In support of the residual effects characteristics described in **Section 6.7.3**, **Table 6-1**, the following Community Well-Being community well-being definitions apply to the effects assessment.

Ecological and Social Context

The ecological context of effects has been considered in developing the effects criteria, such as species sensitivity and resilience, and includes Indigenous Knowledge (where available). The ecological context of the effect includes a discussion of the environmental consequences of the predicted effect. The effects assessment also considers timing, such as when the effect could occur during a species lifecycle window, or culturally significant period of time. The social context of the effect includes a discussion of the social and cultural consequences of the predicted effect. The current and future sensitivity and resilience of the valued component to changes caused by the project has also been considered.

Table 9.5-27: Community Well-being Discipline-Specific Magnitude Definitions

Valued Component	Negligible	Low Magnitude	Moderate Magnitude	High Magnitude
• **Sustainable Population Growth**	• No measurable change in population trends	• Minor population fluctuations, absorbed by existing infrastructure	• Some in-migration or out-migration requiring housing or service adjustments	• Population changes straining infrastructure, housing, and services
• **Labour Market Dynamics**	• No measurable effect on employment or job market	• Small, temporary changes in job opportunities	• Noticeable shifts in job availability, requiring training or new policies	• Permanent work force restructuring, creating dependence on external labour or job displacement
• **Economy**	• No measurable impact on local businesses, community budgets, revenues or regional economy.	• Minor new opportunities or challenges, minor shifts in expenditures or revenues, easily absorbed; minor regional economic fluctuations.	• Business growth or decline requiring investment, adaptation, or policy changes; noticeable budgetary impacts requiring reallocation of funds or new revenue sources; moderate regional growth (or decline) requiring policy intervention.	• Permanent economic restructuring, leading to dominance of external businesses or loss of local enterprises; large-scale financial burden or revenue loss; permanent economic shifts increasing disparities between communities.
• **Community Access to Infrastructure and Services**	• No measurable change in access or service levels	• Slight measurable change in access or service levels, absorbed by existing infrastructure	• Measurable change in access or service levels, requiring slight infrastructure adjustments	• Measurable change prompting consideration of infrastructure expansion
• **Housing**	• No measurable change in housing adequacy and suitability	• Minor repairs or upgrades become more feasible (for example, more frequent maintenance, better insulation).	• Some improvements in housing adequacy and suitability, but issues like overcrowding may persist in certain areas.	• Improved match between housing supply and community needs, addressing long-standing shortages.
• **Cultural Preservation and Change**	• No measurable change in cultural practices, identity, or language use	• Some opportunities for increased participation in cultural activities, traditional economy, or language use	• Noticeable increase in access to cultural activities, traditional economy, and language use, leading to stronger community connections	• Greater access and participation in cultural traditions, land-based practices, and language use, supporting long-term continuity
• **Community and Public Health**	• No measurable decline in community mental health outcomes or change in substance abuse.	• Minor decrease in negative mental health and minor increase in substance abuse, despite improved access to healthcare and treatment	• Moderate decrease in mental health and moderate increase in substance abuse, despite improved access to healthcare and treatment.	• Widespread decrease in mental health and increase in substance abuse, leading to noticeable decline in overall health outcomes for individuals and community well-being over time despite improved access to healthcare and treatment.
• **Access to Clean Water**	• No measurable impact on water quality or availability	• Minor improvements or disruptions in water availability or quality, with limited impact on costs or access	• Reduced transportation costs for bottled water and increased access to water testing and repairs to the water treatment plant, resulting in more reliable access to clean water	• Consistent and affordable supply of clean water, driven by improved water infrastructure, including long-term reductions in bottled water costs and improved water testing and treatment plant repairs, supporting sustainable access to clean water
• **Traditional Foods**	• No measurable impact on access, availability, access to store-bought foods, or quality of traditional foods.	• Improved access to traditional foods, but no significant change in availability or quality of traditional foods. • No change in reliance on store-bought foods.	• Improved access to traditional foods, observed decline in availability and / or quality of traditional foods.	• Improved access to traditional foods, significant and measurable decline in availability and / or quality of traditional foods. • Improved access (including reduced costs) associated with store-bought foods.
• **Public Safety**	• No measurable impact on crime rates, emergency response, or safety concerns	• Minor and short-term safety concerns	• Increased safety risks requiring some mitigation measures	• Significant and ongoing safety concerns requiring major interventions
• **Biophysical Factors Influencing Human Health**	• No measurable effect on air quality, noise and vibration, soil, or water	• Minor, temporary degradation in air quality, noise and vibration, soil, or water	• Noticeable degradation in air quality, noise and vibration, soil, or water requiring mitigation	• Significant, long-term degradation of environmental quality affecting health (for example, respiratory conditions)

9.5.6.3 Residual Effects – Construction Phase

9.5.6.3.1 Sustainable Population Growth

9.5.6.3.1.1 Potential Effects

Age Distribution

During construction, employment opportunities may lead to an increase in the working-age population in Marten Falls First Nation and Aroland First Nation, including both members and non-members moving into the community. This demographic shift could have some effects, such as changes in family structures, community dynamics, and social cohesion, particularly if many of the returning or new residents are young men. Social integration (family reunification) challenges may arise for these individuals, especially if they have spent a long time away from the community.

Gender Distribution

Construction employment opportunities, which have historically been male dominated, may lead to a temporary rise in the male population, resulting in an effect of gender imbalance within the communities. The potential changes in employment dynamics requires Gender-Based Analysis Plus considerations, particularly for women and gender-diverse individuals, who may bear caregiving responsibilities if more male family members are hired for the project.

Community Population

There is potential for an increase in the percentage of community members from Marten Falls First Nation living on-reserve versus off-reserve. As community members living off-reserve gain construction-related employment, it is possible that they may bring their spouse and children to live in the community so they can maintain close relationships with family on days off from work. This rapid population increase could have a effect on community members as it may reduce community cohesion during construction.

9.5.6.3.1.2 Mitigation and Enhancement Measures

Age Distribution, Gender Distribution, Community Population

To mitigate effects to sustainable population growth during construction, the following measures will be implemented:

- The owner / operator will establish a working group with Marten Falls First Nation and Aroland First Nation to meet regularly to discuss community-proposed topics in relation to the construction of the Community Access Road, including topics

related to rapid population changes, social cohesion or (re)integration challenges.

- All construction workers (including on- and off-reserve members) will be housed in autonomous work camps to limit in-community demographic shifts and limit disruptions to social structures and community dynamics.
- Owner / operator to implement Diversity, Equity, and Inclusion hiring policy. This could be enhanced through training programs, job fairs, child-case supports, and outreach, to actively prioritize women in construction-related employment opportunities and reduce gender disparities in the work force and therefore reduce gender imbalances within the community.

9.5.6.3.1.3 Predicted Residual Effects

With mitigation measures effectively implemented, there are no residual effects related to sustainable population growth during construction.

9.5.6.3.2 Labour Market Dynamics

9.5.6.3.2.1 Potential Effects

Labour Force

The construction spending for the project is expected to total $1.3 billion. There are barriers to employment which may prevent the hiring of local community members. Most of the jobs created during construction are expected to be supplied from outside the local communities, due to limited local labour force capacity and available regional labour force capacity. As a result, there may be a shortfall in available labour in comparison to the demand for jobs during construction.

Around 3,490 direct jobs from the project are expected to occur in Ontario during construction, accompanied by 3,240 indirect jobs and about 1,870 induced jobs. With a total employment effect of approximately 8,600 jobs in Ontario, construction could lead to about 930 jobs in the rest of Canada. This totals about 9,530 jobs in Canada overall during construction.

Earnings

These employment effects are expected to directly create about $360 million in Ontario's labour income, along with an indirect effect of $252 million and an induced effect of $109 million. This implies an average labour income of around $84,000 per job. For Canada overall, the total labour income effect is $789 million, which gives an average labour income of about $82,800 per job. Considering the effects on Ontario's Gross Domestic Product (which measures the income produced, rather than income

received), the expected total effect in Ontario is around $1.2 billion. This implies an average income produced of nearly $137,100 per job. The gap between this ratio and the labour income to employment ratio is largely due to net profits and net taxes. On the other hand, the expected total effect on Canada's Gross Domestic Product is over $1.3 billion, which implies an average income produced of $138,300 per job. The ratio of Gross Domestic Product to employment is also sometimes used as a rough measure of productivity (amount produced relative to amount used).

There is potential for an increase in employment among men in both Marten Falls First Nation and Aroland First Nation, as they make up a slightly larger proportion of those participating in the labour force and may be more familiar with work environments related to construction or land based activities. In Aroland First Nation, men are represented in agriculture, manufacturing, and public administration, sectors that may offer some transferable skills to construction. In Marten Falls First Nation, men participate primarily in educational services and public administration, which offer fewer direct pathways into construction roles. Women in Marten Falls First Nation, who are represented in educational services, health care and social assistance, accommodation and food services, and public administration, may face additional challenges entering construction because these sectors are not closely aligned with typical construction occupations. In Aroland First Nation, women participate mainly in construction and educational services, with limited involvement in other sectors. As a result, any increase in employment during construction is expected to be experienced unevenly between men and women across both communities.

Indirect input-output economic effects occur within the supply chain as a result of industry linkages. When demand for a specific product or service increases, the industries supplying the necessary materials, labour, or support services also experience growth.

9.5.6.3.2.2 Mitigation and Enhancement Measures

To better meet the increase in demand for local labour, the following mitigation measures are recommended:

- Project owner / operator will establish a working group with Marten Falls First Nation and Aroland First Nation to meet regularly to discuss community-proposed topics in relation to the construction of the Community Access Road. The working group could explore support for unemployed community members by identifying employment barriers and offering job readiness programs to support community members facing unemployment.

- Owner / operator will implement Community Readiness Strategies and Adaptive Management Plans to assess and respond to community needs through construction.
- Owner / operator will provide information on available opportunities to help Marten Falls First Nation and Aroland First Nation community members understand the opportunities and provide time to obtain the necessary qualifications.
- Owner / operator will create a Local Training Plan to complete a local skills assessment and utilize local labour force.
- Project owner will provide ongoing job readiness programs, continuously enhancing training opportunities to support community members in their transition into the workforce and long-term career growth. Timing of training and education will be coordinated in advance of hiring to reduce barriers to participation.
- Owner / operator will implement Diversity, Equity, and Inclusion hiring policy. This could be enhanced through training programs, job fairs, and outreach, to actively prioritize women in construction-related employment opportunities and reduce gender disparities in the work force.
- Owner / operator will implement a gradual work force integration for community members, introducing shorter workdays and shift rotations (for example, starting with 2-3 days on with a day or two break instead of 10 consecutive days) to ease new workers into construction roles.

Enhancement measures focused on improving employment outcomes include:

- Collaboration between the project owner and organizations to provide training programs to prepare local labourers for project-related jobs in construction and transportation. Early investment in skills development will help confirm work force readiness when jobs become available several years in the future.
- Owner / operator should prioritize hiring Marten Falls First Nation and Aroland First Nation members, as well as other Indigenous community members.
- During detail design, the project owner should explore funding opportunities through sources such as the Province of Ontario and Indigenous Services Canada.
- The project owner should work with Kiikenomaga Kikenjigewen Employment and Training Services and other Indigenous training organizations to provide

culturally appropriate education, training, and employment opportunities for community members.

- The owner / operator should collaborate with the Province of Ontario and training institutions to support work force development through apprenticeships and on-the-job training. This could be integrated into social procurement requirements, so that hiring prioritizes local and Indigenous workers while addressing barriers to participation.

9.5.6.3.2.3 Predicted Residual Effects

There are no adverse residual effects for the labour market dynamics during construction of the Project, provided mitigation measures to promote local hiring and remove employment barriers are implemented.

There are potential **positive** residual effects on the economy and the labour market through wider economic benefits. Long-term economic growth requires either higher inputs (more labour and capital), or higher productivity (more productive labour and capital). The Project is expected to have a direct, positive effect on the productivity of individuals and businesses in the region, which can result in improved opportunities and higher earnings. This occurs through two effects:

- Improved access to inputs: Project can lead to increased connectivity that increases the accessibility to a variety of inputs for businesses in the region. This increased access to inputs improves the productivity of these businesses.
- Increased agglomeration: Project can lead to improvements in productivity of businesses through cost savings, knowledge spillovers, efficiency improvements, and facilitation of in-person meetings.

Another potential **positive** and beneficial residual effect is land value uplift. The Project's investment in the Community Access Road is expected to have a positive effect on the value of land that is surrounding the transportation infrastructure. Increased connectivity, greater access, improved travel times, higher safety benefits, and enhanced economic potential are some of the factors that positively affect the value of the land. This increase in land value can increase the wealth of the population and offer more opportunities for efficiency improvements in the labour market. The increase in land value can provide additional resources that allow people to be matched to their desired jobs in a more efficient manner.

Furthermore, increase in the value of land that is held collectively by a First Nation may generate additional revenue and benefits for the community. This increase in land value allows for the shared benefits to be distributed among community members in a way that reflects the community's values. This differs from an increase in value of land that is

owned outright (freehold), where owners may extract benefits in a non-communal manner.

Additionally, with the increase in labour market opportunities, there is a **positive** effect on diversifying the economy, which boosts the health of the economy and the labour market. With greater connectivity comes great opportunity for diversification. For instance, as the number of vehicles increases, there will likely be a need for additional resources to maintain vehicles, leading to employment opportunities as a mechanic, doing safety inspections and regular vehicle maintenance.

Overall, the Project, opportunities exist for Marten Falls First Nation, Aroland First Nation, and neighbouring First Nations to develop service businesses due to the Community Access Road and the related economic growth.

9.5.6.3.3 Economy

9.5.6.3.3.1 Potential Effects

Local Businesses and Commercial Activities

Marten Falls First Nation, as the only community directly connected to the road from the Project, is expected to benefit from new business opportunities that extend beyond the economic benefits associated with the road's construction and operation.

The Project is expected to create business opportunities for Indigenous companies, particularly in road construction and related transportation and service sectors during construction. Overall, these developments are anticipated to have a **positive** effect the business environment for Marten Falls First Nation and neighbouring Aroland First Nation.

During construction, there are potential concerns with respect to work zone effects. Construction of the Community Access Road may result in disruptions to certain individuals and businesses that are in the area close to where the road is being developed. There is therefore a potential **negative** effect of economic activity and construction interfering with local businesses or employers. This is arising from the direct effects of construction, as well as indirect effects through supply chain relationships.

Indirect input-output effects occur in the supply chain due to industry linkages. When demand for a specific product or service increases, the industries supplying the necessary materials, labour, or support services also experience growth. If there is higher direct demand for some product in the economy, then the businesses in the industries supplying that product are indirectly affected.

Public Finances

The Statistics Canada input-output tables provide multipliers for capturing the effects on taxes on products and taxes on production. Taxes on products are taxes payable per unit of a good or service sold, such as sales taxes. Taxes on production are taxes paid by enterprises and are related to operations, such as property taxes and payroll taxes. For taxes on income, the most recent Statistics Canada public finance data can be used to derive the personal income tax proportion of labour income, as well as the corporate income tax proportion of gross operating surplus. The three derived types of taxes on products, production, and income can then be broken down by level of government (federal, provincial, local, and Indigenous), based on the most recent Statistics Canada public finance data.

Note that the public finances measures rely largely on proxy indicators. Overview of community finances provides insight to level of government transfers and funds. For example, if there is a First Nation Development corporation, it may not show up on the band ledger. Furthermore, the tax structure is not the same on a reserve as on other regions. Businesses on Indigenous reserves have specific tax rules. Generally, First Nation-owned businesses operating on reserves are exempt from certain taxes under Section 87 of the Indian Act. This exemption applies to business income earned on a reserve and to goods bought on or delivered to a reserve.

Indirect effects on public finances occur in the supply chain due to industry linkages. When demand for a specific product or service increases, the industries supplying the necessary materials, labour, or support services also experience growth. If there is higher direct demand for some product in the economy, then the industries supplying that product are indirectly affected, which then leads to additional tax revenues.

Other general indirect effects could arise from people moving back to the community given the increase in economic activity and jobs. This increase in population and income would lead to higher demand, including the demand for housing.

Regional Economy

Summary of the regional economic effects of the $1.3 billion construction spending is shown in **Table 9.5-28** and **Table 9.5-29**, followed by sections for each economic indicator.

Table 9.5-28: Ontario Construction Effects

Ontario Construction Effects (millions $)	Direct Effects	Indirect Effects	Induced Effects	Total Effects
Output	1,300	852	400	2,552
Gross Domestic Product	485	424	270	1,179
Labour Income	360	252	109	723
Gross Operating Surplus	134	168	113	415
Taxes on Products	4	7	38	48
Taxes on Production	7	12	21	39
Taxes on Income	93	78	41	212
Employment (jobs)	3,488	3,240	1,873	8,601

Source: Statistics Canada, 2026d, 2026e, 2026f; AECOM Analysis.

Table 9.5-29: Canada Construction Effects

Canada Construction Effects (millions $)	Direct Effects	Indirect Effects	Induced Effects	Total Effects
Output	1,300	1,031	495	2,826
Gross Domestic Product	485	512	322	1,318
Labour Income	360	295	134	789
Gross Operating Surplus	134	211	137	481
Taxes on Products	4	8	42	53
Taxes on Production	7	14	23	44
Taxes on Income	93	94	50	236
Employment (jobs)	3,488	3,775	2,269	9,532

Source: Statistics Canada, 2026d, 2026e, 2026f; AECOM Analysis.

Output

The $1.3 billion construction spending is expected to lead to total economic activity (output) in Ontario of $2.6 billion. For Canada, the total effects on output are estimated to be over $2.8 billion

Gross Domestic Product

Ontario's total economic value, measured by its Gross Domestic Product (income produced), is projected to be around $1.2 billion. Meanwhile, the total effects on Canada's Gross Domestic Product are expected to be over $1.3 billion.

Labour Income

Total effects on labour income are expected to be $723 million in Ontario, with half of those coming from the direct effects. The total effects on Canada's labour income are estimated to be $789 million.

Gross Operating Surplus

Ontario's gross operating surplus total effect is estimated to be $415 million, with the indirect effects being the most dominant. That is even more pronounced for Canada, with the estimated total effects being $481 million.

Taxes

The total effects on taxes in Ontario ($299 million) are led by taxes on income ($212 million), followed by taxes on products ($48 million) and taxes on production ($39 million). The total effects on taxes in Canada are estimated to be $333 million. This is led by taxes on income ($236 million), followed by taxes on products ($53 million) and taxes on production ($44 million).

Employment

The construction phase is expected to involve about 8,600 total jobs in Ontario, which includes around 3,490 direct jobs. The overall employment effect for Canada is expected to be 9,530 jobs, with the indirect effects on employment being most prominent, which highlights the labour-intensive linkages of the supply chain industries.

Indirect input-output effects occur in the supply chain due to industry linkages. If there is higher direct demand for some product in the economy, then the industries supplying that product are indirectly affected. In the context of the Project, the construction spending for the new Community Access Road directly affects the transportation engineering construction industry. The transportation engineering construction industry makes the first round of indirect expenditures on its supply chain industries. Those industries will then make their expenditures on their supply chain industries. The sum of all those indirect effects gives the total indirect effects, as discussed earlier, which represents a **positive** effect on the economy.

Prices

Based on the experience of other comparable communities, as discussed in **Section 5.2.4**, the new Community Access Road is expected to have **positive** effects on the overall quality of life, driven primarily by a reduction in prices and the cost of living, with better access to health care, social services, and family. There are no

significant anticipated effects on Gender-Based Analysis Plus sub-groups related to the overall change in the prices of goods. There may be some potential beneficial effects for those who spend more on products that experience price decreases, such as women who spend more on personal health items.

9.5.6.3.3.2 Mitigation and Enhancement Measures

Local Businesses and Commercial Activities

Mitigation measures to address potential business environment issues include:

- Owner / operator will implement Community Readiness Strategies and Adaptive Management Plans to assess and respond to community needs through construction.
- Owner / operator will create a Local Content Plan to utilize a certain dollar value or share towards local businesses and contractors.
- Owner / operator will consult with local businesses that would be potentially affected by work zone effects and determine the optimal times and conditions for the construction to take place, such as during off-peak times.

Enhancement measures focused on improving the business environment include:

- Owner / operator should prioritize hiring Marten Falls First Nation and Aroland First Nation members, as well as other Indigenous community members.
- During detail design, the project owner should explore funding opportunities through sources such as the Province of Ontario and Indigenous Services Canada.

Regional Economy

The mitigation measure to address potential regional economy issues includes:

- Owner / operator will consult with local businesses that would be potentially affected by work zone effects and determine the optimal times and conditions for the construction to take place, such as during off-peak times.

Enhancement measures focused on improving the regional economy include:

- Owner / operator should prioritize hiring Marten Falls First Nation and Aroland First Nation members, as well as other Indigenous community members.

- During detail design, the project owner should explore funding opportunities through sources such as the Province of Ontario and Indigenous Services Canada.

9.5.6.3.3.3 Predicted Residual Effects

Local Businesses and Commercial Activities

There are no adverse residual effects for the business environment during construction of the Project. Potential **positive** residual effects on the business environment through wider economic benefits. The Project is expected to have a **positive** effect on the productivity of individuals and businesses in the region. This can lead to improved economic opportunities and better long-run prospects for the community.

The Project's investment in the Community Access Road is expected to have a **positive** effect on the value of land that is surrounding the transportation infrastructure. This increase in land value can provide an additional benefit to the population and the local businesses. Transportation infrastructure generally improves land value. Reserve lands are sometimes leased out by First Nations; any increase in land value in proximity to a reserve may drive up land lease income Diversifying the economy can have a positive effect by creating more opportunities, strengthening economic stability, and improving the overall business environment.

Overall, given the unprecedented nature of the Project, it is a great opportunity for Marten Falls First Nation, Aroland First Nation, and neighbouring First Nations to develop service businesses due to the Community Access Road and the related economic growth.

Public Finances

There are no adverse residual effects for the public finances during construction of the Project. The **positive** effect is that the Project will generate government revenue.

Regional Economy

There are no adverse residual effects for the regional economy during construction of the Project.

9.5.6.3.4 Community Access to Infrastructure and Services

9.5.6.3.4.1 Potential Effects

Methods of Transportation in and Out of the Community

Construction is expected to increase reliance on winter roads and air transportation for the mobilization of equipment, supplies, and work force transportation to Marten Falls First Nation. The project is expected to increase road traffic related to the transport of employees, equipment, and supplies, particularly between key staging areas and construction sites. There may be negative effects of reduced safety along winter road transportation in and out of community, when heavy equipment or large shipments of materials may be brought into community. This increased use of the winter roads will be short-term, during construction, until the new Community Access Road is operational.

The airports in Marten Falls and Aroland First Nations will experience negative effects of increased use as a transit hub for equipment and material delivery as well as employees, and their families, traveling to and from the work sites. This increase in use of existing airports may result in potentially negative effects of scheduling challenges for community members.

Essential Infrastructure and Services

The construction of the Community Access Road to Marten Falls First Nation may have a negative effect due to additional strain on the already limited infrastructure and services in Marten Falls First Nation and Aroland First Nation. Both communities face major challenges related to water, wastewater, energy, and waste management systems, which may be worsened by the demands of road construction.

The Marten Falls First Nation water treatment plant has failed inspections over the past six years and remains under a boil-water advisory. Increased construction activity and a temporary influx of workers and community members returning home for employment, will heighten demand for potable water and wastewater treatment, placing further stress on an already overburdened system. The increased wastewater generation could exceed treatment capacity, heightening the risk of untreated sewage discharge into the environment, which could pose additional public health risks and threaten local water sources.

Construction activities will generate large amounts of waste, including residential and construction-related materials. Without adequate waste management systems, improper disposal could lead to soil and water contamination, negatively affecting local ecosystems and community health.

Both Marten Falls First Nation and Aroland First Nation rely on diesel-powered generators for electricity. Construction may increase energy demand, potentially straining power infrastructure. Without supplemental power sources, the community could experience disruptions in essential power-driven services, such as brown outs, where the voltage drops below the standard level, leading to weakened power supply, dimming lights, and potentially affecting sensitive equipment. Grey-outs, caused by large voltage drops, could result in noticeable dimming of lights, malfunctioning of electrical devices, or disruptions in essential services such as heating, lighting, and refrigeration. Such disruptions could compromise the community well-being of residents.

Construction will require a substantial supply of fuel for vehicles and machinery used throughout construction. This includes fuel for construction vehicles, equipment, and transportation vehicles for workers and materials. Increased fuel consumption could lead to supply shortages and increased costs in both Marten Falls First Nation and Aroland First Nation communities.

9.5.6.3.4.2 Mitigation and Enhancement Measures

Mitigation measures for community access to infrastructure and services during construction for Aroland First Nation include:

Methods of Transportation in and Out of the Community

Owner / operator will develop an Equipment Mobilization Plan with both Marten Falls First Nation and Aroland First Nation for the movement of equipment, personnel, supplies, and resources. Where possible, construction traffic should be separated from community traffic to improve safety and minimize disruptions. The mobilization plan should also include a clear communications strategy to keep the community informed of the mobilization schedule, making residents aware of periods of increased heavy equipment traffic on the winter road.

Owner / operator, when possible, will transport employees on a charter flight, to minimize disruption to existing passenger flight schedules servicing community needs.

Essential Infrastructure and Services

Mitigation measures for infrastructure and essential services during construction include:

All construction workers (including on- and off-reserve members) will be housed in autonomous work camps equipped with independent water, wastewater, and power systems. These systems need to be properly maintained to reduce reliance on community infrastructure and to prevent contamination risks.

The owner / operator will develop waste management policies to minimize waste production and support responsible disposal. Collaboration with the community will be prioritized to develop effective construction waste management and disposal strategies, incorporating local input.

The owner / operator will establish a secure fuel storage facility and confirm a reliable fuel supply throughout the construction season. Fuel deliveries will be planned in advance and transported via the winter road, reducing reliance on costly air transport and preserving community fuel resources. All fuel storage sites will comply with safety and environmental regulations to prevent spills and contamination.

The owner / operator will establish a working group with Marten Falls First Nation and Aroland First Nation to meet regularly to discuss community-proposed topics in relation to the construction of the Community Access Road, including topics associated with increasing pressure on local, essential services and infrastructure.

9.5.6.3.4.3 Predicted Residual Effects

Methods of Transportation in and Out of the Community

The anticipated effects are **negative** in direction, of **moderate** magnitude, and are limited in duration to the **short-term**. During construction, there may be a temporary increase in reliance on winter roads and air transport, despite coordination efforts. **Infrequent** but higher-than-usual traffic volumes on winter roads are **possible**, with **low** uncertainty, and could lead to accelerated deterioration, potentially shortening operational periods or increasing maintenance needs **locally**. Effect is **reversible**, as once the project mobilization is completed, transportation demands should return to pre-construction levels. Long-term following the completion of construction of the road, the winter road will be decommissioned.

Essential Infrastructure and Services

No adverse residual effects are anticipated.

9.5.6.3.5 Housing

9.5.6.3.5.1 Potential Effects

Housing Suitability

During construction, increased economic activity and job opportunities may lead to changes in household occupancy and housing demand within Marten Falls First Nation and Aroland First Nation. There is potential for a negative effect to housing suitability due to increased overcrowding as currently off-reserve community members return for

construction-related employment to live with on-reserve family. This may further increase if families of workers also return, resulting in higher household occupancy and potential overcrowding. Spousal or family relocations during workers' time off could directly contribute to increased demand for suitable housing within the community.

As more families temporarily move to Marten Falls First Nation or Aroland First Nation, demand for housing will rise. This could intensify existing housing shortages, potentially leading to overcrowding and putting additional strain on local infrastructure and services. The increased housing demand could particularly affect lower-income families and women-led households, who may face greater challenges in accessing suitable housing options. Overcrowding could disproportionately affect women and children, who are more likely to spend time at home, reducing privacy, safety, means for study, and overall well-being. Without adequate planning, these pressures could result in longer wait times for housing placements or insufficient living space for larger families, negatively affecting residents' quality of life in both Marten Falls First Nation and Aroland First Nation.

9.5.6.3.5.2 Mitigation and Enhancement Measures

Mitigation measures for effects on housing during construction include:

- All construction workers, including on- and off-reserve members, will be housed in autonomous work camps. This will help limit demographic shifts, reduce disruptions, and reduce additional pressure on community housing.
- The owner / operator will establish a working group with Marten Falls First Nation and Aroland First Nation to meet regularly to discuss community-proposed topics in relation to the construction of the Community Access Road, which could include considering if converting construction camps to permanent housing is feasible through working group discussions with Marten Falls First Nation and Aroland First Nation. With advanced planning, construction camps could be built to higher quality standards, making them suitable for long-term residential use and helping to address housing shortages in the community.

9.5.6.3.5.3 Predicted Residual Effects

Housing Suitability

With the planned mitigation measures, no adverse residual effects on housing availability during construction are expected.

Accessibility of Building Homes and Shipping Materials

No effects on housing availability during construction are anticipated.

9.5.6.3.6 Cultural Preservation and Change

9.5.6.3.6.1 Potential Effects

Traditional Economy

The construction of the Community Access Road has the potential to have a effect on the traditional economy of Marten Falls First Nation and Aroland First Nation as land clearing for the road corridor, work camps, and pits and quarries, could lead to the loss of natural areas used for hunting, trapping, and gathering. Construction staging and active work zones may temporarily restrict community access to these areas, potentially during important seasons for traditional activities.

There may be increased competition for local resources if construction workers engage in hunting, fishing, or gathering, placing additional pressure on fish and wildlife populations. Habitat disturbances, noise, and increased human activity could alter wildlife movement patterns, affecting resource availability for the community.

Foraging and plant harvesting, activities central to the roles of women, youth, and Elders, could be affected. For example, the disturbance of wild blueberry harvesting sites, a key resource for Aroland First Nation, could affect both cultural practices and economic opportunities. The Aroland Youth Blueberry Initiative, which focuses on cultural continuity and economic development, may face challenges if traditional harvesting areas are disturbed or overharvested by non-community members. If programs such as the Aroland Youth Blueberry Initiative experiences setbacks, this may further affect the community's economic and cultural sustainability.

Indigenous communities with overlapping interests in the Local Study Area, including Constance Lake, Neskantaga, Animbiigoo Zaagi'igan Anishinaabek, Ginoogaming, and Long Lake #58 First Nations, face similar risks and potential negative effects to their traditional economies as those identified for Marten Falls First Nation and Aroland First Nation community members. Potential effects include reduced access to hunting and trapping areas and disturbance of wildlife such as moose and caribou. These changes threaten subsistence practices, fur trading, and other potential commercial activities. Disruptions to these systems could erode food security, intergenerational knowledge transfer, and the economic resilience of these communities.

Use of Traditional Language

Between 2016 and 2021, language use fluctuated in both communities, with a decline in Ojibway speakers in Marten Falls First Nation and a slight increase in Aroland First Nation. The overall concern about decline in use of traditional languages remains, particularly in environments dominated by English. While most community members

speak English, fluency levels vary, and for some members, traditional languages are their first language. In construction-related jobs, workers may feel pressure to speak only English, leading to reduced use of traditional languages in the workplace. This could be due to the use English in technical and safety communications, the presence of non-Indigenous workers, or a workplace culture that does not actively support multilingualism.

As a result, there may be a effect of reduced use of traditional language over time, contributing to language loss, particularly among younger workers who might already have limited fluency. As highlighted during community consultations, supporting use of traditional languages should be considered during project development. Women, especially Elders, are crucial to preserving language, and discouraging younger generations from using Ojibway in the workplace may increase the burden on women to maintain it within families and communities. Additionally, language barriers could limit economic opportunities for women, particularly if traditional language speakers face challenges in accessing employment or leadership roles in construction and resource industries.

9.5.6.3.6.2 Mitigation and Enhancement Measures

Traditional Economy

Mitigation measures for Traditional economy include:

- Prior to construction, owner / operator will develop Access Management Plans with Marten Falls First Nation and Aroland First Nation in relation to hunting, trapping and gathering activities. All activities must conform to licensing requirements and adhere to the rules and regulations under the Ministry of Natural Resources. This plan may include, but not be limited to:
  - Identifying key traditional hunting, trapping, and gathering areas to avoid, to minimize construction disturbance during peak harvest seasons.
  - Designating specific, approved locations for berry picking and recreational fishing for non-Indigenous workers while identifying restricted areas to protect community resources and minimize disturbance.
- Owner / operator to provide flexible work schedules for First Nation members during key hunting, trapping, and gathering seasons to support continued access to traditional food sources.
- Owner / operator to sponsor community-led harvesting initiatives in Marten Falls First Nation and Aroland First Nation.

- Owner / operator to establish working groups with Marten Falls First Nation and Aroland First Nation, and other interested Indigenous communities from the Regional Study Area, to meet regularly to discuss community-proposed topics in relation to the construction of the Community Access Road, including where to appropriately locate safety pull out areas to promote access, and other harvesting issues.
- Enhancement measures for Traditional Economy that can be further explored during detail design include:
  - Owner / operator to consider employment opportunities for First Nation community members as guides for construction workers participating in permitted outdoor activities.
  - Owner / operator to source traditional foods for work camps when possible, supporting local harvesters and small businesses, for example the Aroland First Nation Blueberry Initiative.
  - Owner / operator to consider supporting women-led initiatives, such as traditional food workshops or Indigenous-run catering services, to create economic benefits while reinforcing cultural identity.

Participation in Cultural Activities

Enhancement measures that could be further explored during detail design for participation in cultural activities in the community include:

- If pull-out areas are identified along the route for safety, these could be enhanced to include picnic tables, a fire pit, and an opportunity to use a non-plumbed restroom (outhouse). The meeting point could include safety measures that would have to be further explored logistically, that could include an emergency phone, or establish a cell tower to receive cell service, and have solar-powered lights.

Use of Traditional Language

Mitigation measures for change in use of traditional language include:

- Owner / operator to provide Training and Work Materials in Indigenous Languages. Offer onboarding materials, safety protocols, and job-related paperwork in Indigenous languages alongside English to provide language accessibility for all workers.
- Owner / operator to implement multi-lingual worksite signage. Reduce language barriers at the worksite by using multi-lingual signage at work sites, including directional signs, safety notices, workplace policies, and equipment labels, to promote the use of Indigenous languages in the workplace.

- Owner / operator to provide Cultural Sensitivity and Language Awareness Training. Educate non-Indigenous supervisors and workers on the importance of Indigenous languages in cultural identity, knowledge transmission, and community well-being. Encourage an inclusive workplace where traditional language use is supported and valued.
- Owner / operator to implement a Zero-Tolerance Policy for Language Discrimination. Establish clear workplace policies that prevent Indigenous workers from being discouraged from speaking their traditional language. Supervisors and project managers should actively reinforce language inclusivity and address any instances of discrimination or bias.
- Owner / operator to introduce a cultural safety mechanism. Introduce a workplace mechanism, such as a cultural safety flag, allowing employees to pause work or request support if they feel uncomfortable due to language-related issues. Propose a Cultural Safety and Stop Work Protocol.

Enhancement measures for change in use of traditional language include:

- Owner to consider incorporating Indigenous language in signage along the road. During detail design with Marten Falls First Nation and Aroland First Nation, should explore naming key landmarks, stopping points, and significant locations along the road in Indigenous languages to promote language visibility and daily use.
- Owner / operator to encourage traditional language use in informal work settings. Promote the use of traditional greetings and phrases in the workplace. Create spaces for Indigenous language speakers to communicate in their language during breaks or informal settings.
- Owner / operator to consider designating dedicated gathering spaces in construction camps for cultural exchange and knowledge transfer.
- Owner / operator to consider efforts to enhance language transmission, such as providing funding or resources to support language education, intergenerational learning, and community-driven cultural revitalization initiatives, could help preserve traditional language in both Marten Falls First Nation and Aroland First Nation.

9.5.6.3.6.3 Predicted Residual Effects

Traditional Economy

Despite mitigation measures, there remains some **low** magnitude, effects are **negative** in direction**.** Effects include a **possible** shift from traditional economy activities due to

loss of traditional harvesting areas or disturbance in the local Construction Disturbance Area. This could reduce available land for traditional activities within the project footprint, but uncertainty is **high**. Once operational, the road may improve access to new areas (as discussed in the Operations section).

During construction, **frequent** and **medium-term** disruptions to traditional land use are anticipated due to active work zones and **irreversible** land disturbance. While mitigation measures aim to minimize these effects, some access restrictions during key harvesting periods are likely.

The residual effects remain for the Indigenous communities with overlapping interests in the Local Study Area, including Constance Lake First Nation, Neskantaga First Nation, Animbiigoo Zaagi'igan Anishinaabek, Ginoogaming First Nation, and Long Lake First Nation.

Participation in Cultural Activities in the Community

No residual effects during construction.

Use of Traditional Language

No residual effects are anticipated during construction, with proper implementation of mitigation measures.

9.5.6.3.7 Community and Public Health

9.5.6.3.7.1 Potential Effects

Mental Health and Well-being

The construction of the Community Access Road may have both positive and negative effects on the mental health and well-being of community members, primarily through employment opportunities, workplace conditions, and broader social dynamics within the community.

A potential **positive** effect is improved mental well-being due to employment in construction which can enhance financial stability, self-sufficiency, and pride, reduce financial stress, boost confidence, and build self-efficacy. Work force participation can lead to positive social interactions, teamwork, and professional development through training and experience, increasing individuals' self-esteem, strengthening internal and external relationships. Participating in the work force can create positive role models, inspiring younger generations through local employment success in construction.

Indigenous communities with overlapping interests in the Local Study Area, including Constance Lake, Neskantaga, Animbiigoo Zaagi'igan Anishinaabek, Ginoogaming, and Long Lake #58 First Nations, may experience similar positive effects from the Project.

Construction may also have a negative effect on mental health and well-being due to long hours, tight deadlines, and physically demanding tasks, leading to stress and fatigue. Working in a diverse cultural environment, particularly alongside non-Indigenous workers, could add challenges if cultural differences and language barriers are not addressed. High potential for Indigenous employees to experience micro aggressions, leading to elevated stress levels may result in high turnover, absenteeism, or workplace tensions if workers feel unsupported or struggle to adapt.

There is potential for social disconnection and emotional strain, as community members employed in construction may need to spend extended periods away from their families, leading to emotional distress, loneliness, and isolation.

Additionally, mental health and psychosocial well-being may be affected by increased sensory disturbances and restricted land access. Activities such as clearing, blasting, and heavy equipment operation introduce noise, dust, and visual changes that can disrupt the sense of place and diminish the quality of land-based experiences. For Indigenous communities, these changes can lead to feelings of disconnection and ecological grief, particularly when culturally significant areas are altered or temporarily inaccessible. The heightened industrial presence during construction may also exacerbate stress for individuals already facing mental health challenges, such as elevated suicide rates and addictions, by reducing opportunities for land-based healing and cultural practices.

Indigenous communities with overlapping interests in the Local Study Area, including Constance Lake, Neskantaga, Animbiigoo Zaagi'igan Anishinaabek, Ginoogaming, and Long Lake #58 First Nations, face similar risks and potential negative effects to their mental health and well-being as those identified for Marten Falls First Nation and Aroland First Nation community members. Potential effects include increased pressure from employment stress, community tension from employment disparities, and mental health and well-being effects related to changes to the land.

Substance Use

The introduction of a temporary work force into a remote First Nation community with no prior road access may have a negative effect of increasing alcohol and drug use. Construction workers may bring in prohibited substances, contributing to potential substance misuse issues within the community. Increased access to alcohol and drugs could affect vulnerable populations, such as youth and individuals recovering from

substance dependence, leading to social and health challenges like family disruptions and addiction-related concerns. An increased availability of alcohol and drugs could have social effects on Elders who may be at risk due to potential abuse or neglect within the family unit, while women and girls, especially those in caregiving roles or experiencing domestic violence, could face increased vulnerability. An increased presence of alcohol and drugs could negatively affect sexual health among as substance misuse can increase the likelihood of unsafe sexual practices, raising the risk of sexually transmitted infections or unwanted pregnancies.

Substance use within the work force may compromise workplace safety, leading to a higher risk of accidents, absenteeism, and reduced productivity. Impairment on the job could pose serious risks in a construction setting, particularly in operating heavy machinery or working in hazardous conditions. For community members employed in construction, exposure to workplace substance use could normalize unhealthy coping mechanisms for stress and fatigue, potentially leading to increased substance use among workers.

Road construction, especially in remote locations, is physically demanding and time-sensitive, requiring workers to endure long hours in harsh weather conditions. The stress of meeting deadlines and maintaining safety standards can lead to mental fatigue contributing to mental health concerns like anxiety or depression. This emotional strain may increase the likelihood of substance use as a coping mechanism. Additionally, the intense physical labour, including excavation, grading, and operating heavy machinery, can lead to physical exhaustion. Some workers, particularly men, may resort to alcohol or drugs to manage the discomfort, escape from isolation, or unwind after long, grueling workdays.

9.5.6.3.7.2 Mitigation and Enhancement Measures

Mental Health and Well-being

Mitigation measures to address potential negative effects on mental health, well-being, and employment challenge include:

- Owner / operator to collaborate with Marten Falls First Nation and Aroland First Nation to provide mental health counseling, mentorship, and peer support at work camps, with onsite Elders or cultural liaisons to promote emotional and cultural well-being, support skill development and workplace adjustment.
- Owner / operator to implement a gradual work force integration for community members, introducing shorter workdays and shift rotations (for example, starting with 2 to 3 days on with a day or two break instead of 10 consecutive days) to ease new workers into construction roles.

- Owner / operator to provide cultural safety training for all workers, including supervisors and non-Indigenous employees, to complete training on Indigenous culture, traditions, and historical experiences, to promote a safe and inclusive work environment.
- Owner / operator to hold training session on violence and harassment prevention.
- Owner / operator to enforce a zero-tolerance policy for workplace discrimination so that Indigenous workers feel respected and included.

Enhancement measures to enhance overall mental health and well-being include:

- Owner / operator to offer flexible work schedules to accommodate family responsibilities and cultural activities, which may reduce employee stress and to improve employee retention. This can include:
  - Family related leave where shift adjustments may be requested for family emergencies or events (for example, funerals, childcare).
  - Leave for participation in cultural activities, such as the annual pow wow, traditional harvest, or ceremonies.
  - Shift flexibility for employees to swap shifts or adjust work hours to accommodate personal needs.
- Owner / operator to designate a local hiring liaison to support Indigenous hiring, match skills with job opportunities, and to advocate for community member's needs.

Substance Use

Mitigation measures to address risks of substance use include:

- The owner / operator will establish a working group with Marten Falls First Nation and Aroland First Nation to meet regularly to discuss community-proposed topics in relation to the construction of the Community Access Road, which could include topics in relation offering mental health supports, counselling and addiction support services.
- All construction workers (including on- and off-reserve members) will be housed in autonomous work camps to limit demographic shifts and limit disruptions to social structures and community dynamics.

- The owner / operator to develop and implement monitoring and enforcement, including regular security checks at work camps and entry points (for example, airport) for alcohol and substances to prevent entry into the community.
- Owner / operator to collaborate with the community (Marten Falls First Nation and Aroland First Nation) to provide mental health counseling, addictions counseling, mentorship, and peer support at work camps, with onsite Elders or cultural liaisons to promote emotional and cultural well-being.
- Owner / operator to enforce a zero-tolerance policy for alcohol and substance use at work camps via mandatory onsite alcohol and drug testing.
- Owner / operator to implement a gradual work force integration for community members, introducing shorter workdays and shift rotations (for example, starting with 2-3 days on with a day or two break instead of 10 consecutive days) to ease new workers into construction roles.
- Owner / operator to provide cultural safety training for all workers, including supervisors and non-Indigenous employees, to complete training on Indigenous culture, traditions, and historical experiences, to promote a safe and inclusive work environment.
- Owner / operator to hold training session on violence and harassment prevention.
- Owner / operator to enforce a zero-tolerance policy for workplace discrimination so that Indigenous workers feel respected and included.
- Owner / operator to provide cultural and recreational activities (for example, cards, board games, sports), when possible, to promote well-being and reduce boredom or stress-related substance use.

9.5.6.3.8 Access to Clean Water

9.5.6.3.8.1 Potential Effects

Access to Clean Water

The construction of a Community Access Road may have a negative effect on Marten Falls First Nation and Aroland First Nation of increasing demand for drinking water due to the presence of workers and additional infrastructure needs. If the local supply is insufficient, the communities may become more reliant on bottled water flown in. This assumes the water treatment plant remains non-operational. These factors could strain local resources. Construction activities may also cause an indirect effect of increasing the cost of water, including bottled water delivered into community during the boil-water

advisory, adding add financial pressure on both the First Nation communities and the Project.

Quality of Drinking Water

The quality of surface water may be affected by construction activities. An assessment of the quality of surface water can be found in the Problem Formulation for Human Health Risk Assessment (Appendix T). Potential effects on human health may be from chemical exposures through the consumption of contaminated water or through dermal absorption (through the skin) during recreational activities, bathing, or other direct contact. Volatile substances in water may be inhaled during activities such as cooking and bathing. Construction activities that may affect surface water quality include:

- Clearing the right-of-way for the Community Access Road and supporting access roads;
- Blasting rock;
- Construction of the Community Access Road;
- Construction and installation of bridges and culverts; and
- Construction and operations and decommissioning of temporary infrastructure

Indigenous communities with overlapping interests in the Local Study Area, including Constance Lake, Neskantaga, Animbiigoo Zaagi'igan Anishinaabek, Attawapiskat, Kashechewan, and Fort Albany First Nations, face similar risks and potential negative effects to quality of surface water as those identified for Marten Falls First Nation and Aroland First Nation community members.

9.5.6.3.8.2 Mitigation and Enhancement Measures

Access to Clean Water

Mitigation measures to access clean drinking water include:

- All construction workers, including on- and off-reserve members, will be housed in autonomous work camps, reducing pressure on community water resources.
- Owner / operator to implement temporary water storage tanks or other measures to accommodate peak water demands during construction, reducing reliance on flown-in water and helping to balance the construction and community needs. Aligning water delivery schedules, using water-efficient equipment, and coordinating bulk water orders, to mitigate any effects on the community's water supply.

Enhancement measures include:

- Owner / operator to promote water conservation strategies within the construction camps, including education on water-saving techniques and encouraging sustainable water usage habits for example low flow / water saving faucets.

Quality of Drinking Water

- Owner / operator to establish working groups with Marten Falls First Nation, Aroland First Nation, and other interested Indigenous communities from the Regional Study Area, including Constance Lake, Neskantaga, Animbiigoo Zaagi'igan Anishinaabek, Attawapiskat, Kashechewan, and Fort Albany First Nations, to meet regularly to discuss community-proposed topics in relation to the construction of the Community Access Road, including concerns related to quality of surface water.
- Waste, fuel, and hazardous materials will be handled under approved plans with spill prevention measures—following strict environmental standards and regulations, and continuous monitoring will confirm compliance and address any unexpected changes in water quality.

9.5.6.3.8.3 Predicted Residual Effects

Access to Clean Water

The indirect of increased water costs will be negligible, and any potential strain on transportation logistics for water delivery will be managed effectively, so that the community continues to receive its necessary water supply without disruption. There are no anticipated adverse effects on access to clean water if proactive mitigation measures and coordination between the construction activities and the community's water supply needs are implemented.

Quality of Drinking Water

Construction activities may result in negative residual changes to surface water quality and sediment quality from surface runoff and releases of suspended solids, chemical, biological and physical contaminants and physical disturbance and debris. Additionally, the deposition of particulate from air emissions and dust generated during construction and operations activities may also negatively affect surface water and sediment quality.

9.5.6.3.9 Traditional Foods

9.5.6.3.9.1 Potential Effects

Access to Traditional Foods

The construction of the Community Access Road may have a **positive** effect on the access to traditional food in Marten Falls First Nation and Aroland First Nation. Increased income from construction jobs could help community members purchase equipment, fuel, and supplies for hunting and trapping, support traditional harvesting, and increase access to traditional goods. The effect of the Community Access Road on traditional foods are further explored in the Aboriginal Treaty Rights and Interests assessment.

Availability of Traditional Foods

Construction activities, including land clearing for the road corridor, work camps, and pits and quarries, may have a effect due to disturbances that reduce the availability of some traditional foods during key harvest seasons.

Quality of Traditional Foods

Construction activities may disturb local ecosystems and reduce the quality of traditional foods during important harvesting periods. These activities include land clearing for the road corridor, work camps, and material source areas. Residual effects on surface water, groundwater, air, soils, peatlands, and noise levels can influence environmental conditions in both the Local and Regional Study Areas, which in turn may affect the condition of fish, vegetation, birds, and ungulates used as traditional foods. When traditional foods are harvested from affected areas, contaminants may pose direct risks to people who consume them.

Indigenous communities with overlapping interests in the Local Study Area which include Constance Lake First Nation, Fort Albany First Nation, Attawapiskat First Nation, Kashechewan First Nation, Kasabonika Lake First Nation, Kitchenuhmaykoosib Inninuwug First Nation, Kingfisher Lake First Nation, Eabametoong First Nation, Mishkeegogamang First Nation, Neskantaga First Nation, Nibinamik First Nation, Wapekeka First Nation, Wawakapewin First Nation, Webequie First Nation, Weenusk First Nation, Wunnumin Lake First Nation, Animbiigoo Zaagi'igan Anishinaabek, Ginoogaming First Nation, and Long Lake #58 First Nation may face similar potential **negative** effects related to the quality and availability of some traditional foods as those identified for Marten Falls First Nation and Aroland First Nation.

9.5.6.3.9.2 Mitigation and Enhancement Measures

Access, Availability and Quality of Traditional Foods

Mitigation measures to mitigate the potential effects on the accessibility, availability and quality of traditional foods include:

- Owner / operator should provide flexibility in work schedules during key hunting, trapping, and gathering seasons to support continued access to traditional food sources.
- The owner / operator will establish a working group with Marten Falls First Nation and Aroland First Nation, and other affected Indigenous communities, to meet regularly to discuss community-proposed topics in relation to the construction of the Community Access Road to identify key harvesting areas to implement measures that can minimize construction disturbances and contamination to traditional food resources during harvesting seasons. This may include adjusting construction activities to avoid peak harvesting periods.

9.5.6.3.9.3 Predicted Residual Effects

Access to Traditional Foods

If mitigation measures are implemented there is anticipated to be minimal to no adverse residual effect on the accessibility of traditional foods because of the increased flexibility for community members to balance employment and traditional harvesting.

Availability of Traditional Foods

There is a **negative** effect on the availability of traditional foods, due to disturbances from construction activities, that may not be fully mitigated. This effect is **possible**, expected to be of **low** magnitude, **local** and **short-term**. The effect may be **infrequent** and **reversible**, and has a **high uncertainty.**

Quality of Traditional Foods

The quality of fish, vegetation, wildlife, birds, and ungulates as a traditional food is dependent on the quality of their habitat or namely the surface water, air and soil quality to which they are exposed. Effects from soil contamination leaching, emissions of criteria air contaminants and deposition to surface water, changes to erosion and sedimentation, changes to surface water quality, dust deposition, and increased public access to fish have the potential to affect the quality of fish, vegetation, wildlife, birds, and ungulates as country foods and potentially affect human health.

There is also a possible effect on the quality of traditional foods, due to contamination from construction activities that may not be fully mitigated. This effect is expected to be of **moderate** magnitude, **local,** and **short-term**. The effect may be **infrequent, irreversible**, with a **high** uncertainty.

These residual effects on the availability and quality of traditional foods apply to the Indigenous communities with overlapping interests in the Local Study Area, including Constance Lake First Nation, Fort Albany First Nation, Attawapiskat First Nation, Kashechewan First Nation, Kasabonika Lake First Nation, Kitchenuhmaykoosib Inninuwug First Nation, Kingfisher Lake First Nation, Eabametoong First Nation, Mishkeegogamang First Nation, Neskantaga First Nation, Nibinamik First Nation, Wapekeka First Nation, Wawakapewin First Nation, Webequie First Nation, Weenusk First Nation, Wunnumin Lake First Nation, Animbiigoo Zaagi'igan Anishinaabek, Ginoogaming First Nation, and Long Lake #58 First Nation may face similar potential negative effects related to the quality and availability of traditional foods as those identified for Marten Falls First Nation and Aroland First Nation.

9.5.6.3.10 Public Safety

9.5.6.3.10.1 Potential Effects

Drivers Licence

During construction, employment opportunities in road building will increase, particularly in roles such as truck driving, equipment operation, and material transport. Holding a valid driver's licence will be required for many community members to access onsite and community-based jobs. This is likely to increase demand amongst individuals in both Marten Falls and Aroland First Nation to hold a valid Driver's Licence. However, there are barriers to community members obtaining a driver's licence, such as the cost of travel to urban centres, challenges in completing the necessary assessments, and difficulties accessing required documentation. Unless barriers are addressed, there is likely to be the effect that demand for workers with Driver's licences exceeds those available, thereby limiting the community benefits of the Project.

Road Safety

Construction will have an effect road safety due to traffic of heavy machinery, construction vehicles, and material transport on the winter road to Marten Falls First Nation. Local residents traveling on the same road may be at risk, especially when large vehicles such as trucks and construction equipment share the road. The increased vehicle movement heightens the potential for accidents, particularly in areas with narrow or poorly maintained road segments. Traffic congestion on these narrow or difficult-to-

navigate sections could increase the risk of collisions, especially with large construction vehicles. Inadequate signage and unfamiliarity with the route further elevate the risk for workers or truck drivers not accustomed to traveling on the winter road.

Emergency Services

The construction of the Community Access Road is expected to have an effect on emergency services due to higher risks of potential workplace injuries, vehicle accidents, and other construction-related incidents. As a result, emergency response teams serving Marten Falls First Nation and Aroland First Nation may experience a higher number of service calls related to construction site injuries and traffic incidents. This could divert resources from responding to other emergencies in the communities, potentially delaying access to timely medical care for residents.

Severe injuries requiring advanced medical treatment may need medical evacuations to Thunder Bay or other regional hospitals. A higher frequency of medical transports may place additional pressure on limited local resources responsible for coordinating medical flights, further delaying or reducing emergency services for community Women, Elders, and caregivers may face greater challenges accessing emergency services, such as maternal health, chronic illnesses, or Elder care, if local resources are strained due to construction-related incidents.

An increase in emergency response demands may result in the indirect effect of increased demands on community health service workers, who provide administrative, operational, maintenance, and prevention-focused care through programs such as Building Healthy Communities, the Aboriginal Diabetes Initiative, and the National Native Alcohol and Drug Abuse Program. Increased pressure on these workers could reduce the capacity to deliver essential services such as maternal and child health programs, mental health support, and preventative care.

Violence and Harassment

The construction of the Community Access Road may have an effect of increasing violence and harassment within the community, particularly with the presence of outside workers and the interaction between these workers and community members.

The presence of outside workers may increase aggression or disruptive behaviour, intensified by cultural differences, lack of familiarity with the community, and challenges in integrating into the local social fabric. An influx of workers, especially if the work force is primarily from outside the community, may increase risks of racial, ethnic, or gender-based harassment of Indigenous community members, particularly women and gender-diverse individuals. This could include verbal abuse, inappropriate behaviour, or

physical harassment and may be compounded by power dynamics of non-community workers and local residents.

If some individuals are excluded from construction-related employment, this may have the indirect, negative effect of increasing lateral violence, conflicts among Indigenous community members, verbal or physical altercations, rumours, or social divisions, ultimately disrupting community cohesion and furthering social tensions.

These risks, ranging from interpersonal conflict and harassment to domestic strain and community fragmentation, create conditions in which gender-based violence may become more prevalent. Gender-based violence refers to harmful acts rooted in gender inequality and power imbalances, disproportionately affecting women, girls, and gender-diverse individuals. In the context of the Community Access Road, the presence of outside workers, cultural and social tensions, and economic disparities may intensify vulnerabilities among Indigenous community members, particularly women and gender-diverse people. Prolonged shift work and separation from family may increase marital strain, potentially leading to higher instances of domestic violence or family breakdown. Communication challenges between partners, particularly in the context of work-related stress, can intensify these issues. Recognizing and addressing these risks is essential to safeguarding community well-being so that mitigation strategies are inclusive, culturally sensitive, and trauma informed.

Indigenous communities with overlapping interests in the Local Study Area, including Constance Lake, Neskantaga, Animbiigoo Zaagi'igan Anishinaabek, Ginoogaming, and Long Lake #58 First Nations, as well as regional municipalities Thunder Bay and Greenstone face similar risks and potential negative effects related to increases in violence and harassment.

9.5.6.3.10.2 Mitigation and Enhancement Measures

Driver's Licence

To the barriers to obtaining a driver's licence in Marten Falls First Nation, the following mitigation measures should be further explored in detail design to increase the number of local Driver Licence holders:

- Owner / operator and owner of the road to explore opportunities to increase total Driver Licence holders, alongside the Ministry of Transportation, partnering with organizations such as:
- Kiikenomaga Kikenjigewen Employment and Training Services, or other trusted organizations, to offer driving training programs to support community members in passing their assessments;

- Third-party organizations that provide drivers licence testing for remote communities.

Road Safety

Mitigation measures to support road safety during construction include:

- Owner / operator will develop an Equipment Mobilization Plan with both Marten Falls First Nation and Aroland First Nation for the movement of equipment, personnel, supplies, and resources. Where possible, construction traffic should be separated from community traffic to improve safety and minimize disruptions. The mobilization plan should also include a clear communications strategy to keep the community informed of the mobilization schedule, making residents aware of periods of increased heavy equipment traffic on the winter road. The plan should include the following components:
  - Weight restrictions. Implement weight restrictions for loads to road damage and confirm safe transport.
  - Designate transport times. Work to establish transport peak periods suitable for the First Nation, where possible.
  - Establish communication protocols. Establish and maintain clear communication with surrounding communities, providing advanced notice of transport schedules and real-time updates on road conditions.
  - Peak hour avoidance. Schedule heavy equipment transport outside of peak community traffic hours.
  - Use pilot vehicles to escort large or heavy equipment when necessary to guarantee safe passage.
- Owner / operator to implement mandatory driver safety training for all employees. This could include training tailored to winter road conditions and remote community travel.

Emergency Services

Mitigation measures for emergency services include the following:

- Owner / operator must develop an onsite safety and emergency preparedness program to include:
  - Implement onsite fire suppression systems, including sprinklers and fire extinguishers, to minimize reliance on local fire services.

  - Provide onsite medical care (paramedics, first aid stations, medics) to reduce pressure on local emergency response services.
  - Train and employ onsite security personnel to monitor safety compliance and enforce safety policies, reducing the strain on local police.
  - Work with the Ministry of Health and other appropriate government agencies to develop a coordinated emergency response plan with local responders for efficient handling of construction-related incidents requiring additional personnel.
  - Establish clear communication protocols between the construction teams and local emergency responders.
- Owner / operator r must compliance with Ontario's *Occupational Health and Safety Act* (Ontario, n.d.a). The owner / operator will adhere to all relevant health and safety requirements, including (but not limited to):
  - Preparation of a Health and Safety Policy covering:
    - Worker safety training (for example, WHMIS, new job procedures)
    - Workplace hazard analysis and incident investigations
    - Communication and feedback mechanism for worker safety concerns
    - Emergency procedures, first aid and rescue procedures
    - Engineering, administrative, and personal protective equipment controls. Enforcement of Stop Work Policies if unsafe conditions are identified

Implementing these measures will minimize accident risks, so that the continued availability of emergency medical flights for non-construction-related community needs, such as medical evacuations for high-risk patients (for example, pregnant women, Elders, and individuals with chronic conditions).

Violence and Harassment

Mitigation measures for violence and harassment include the following:

- Owner / operator to establish working groups with Marten Falls First Nation, Aroland First Nation, and other interested Indigenous communities and municipalities from the Regional Study Area, to meet regularly to discuss community-proposed topics in relation to the construction of the Community Access Road including:

- Financial literacy programs for workers and families to help manage income fluctuations and reduce financial stress, addressing economic disparities that could contribute to resentment and lateral violence.
- Measures to strengthen cultural programming and land-based activities to reinforce community cohesion and well-being. Strengthening cultural identity and offering community-driven programs can provide positive coping mechanisms for workers and families experiencing stress due to shift work and can offer a protective factor against violence and social disruption by strengthening support networks and reducing isolation, support for unemployed community members by identifying employment barriers and offering job readiness programs to support community members facing unemployment.
- All construction workers, including on- and off-reserve members, will be housed in autonomous work camps to limit unsupervised interactions with the community, reducing the risks of harassment, social conflict, and misconduct. The owner / operator will prioritize gender-divided living quarters in the workcamps, offering structured environments with oversight to minimize opportunities for violence or inappropriate behaviour.
- The owner / operator will enforce a zero-tolerance policy towards harassment, discrimination, and violence in work camps and on construction sites with strict enforcement and disciplinary actions in compliance with Ontario's *Occupational Health and Safety Act* (Ontario, n.d.a), it will include:
  - Clear anti-harassment policies defining unacceptable behaviour and consequences.
  - Mandatory reporting mechanisms for safe, confidential reporting of harassment or violence.
  - Third-party oversight for transparency and for unbiased investigations and enforcement. Deliver a violence and harassment training session for employees.
- Owner / operator to provide cultural safety and language awareness training for all workers, including supervisors and non-Indigenous employees, to complete training on Indigenous culture, traditions, and historical experiences to understand Indigenous cultural norms and appropriate community interactions to reduce instances of harassment or violence.
- The owner / operator will comply with the Human Rights Code (Ontario, 2024b) to prevent workplace discrimination and uphold employee rights to reduce work force tensions.

- The owner / operator will provide mental health counseling, mentorship, and peer support at work camps to reduce stress-related aggression. On-site Elders or cultural liaisons will offer emotional support and traditional guidance to workers, helping to address conflicts before they escalate into violence or harassment.
- The owner / operator will implement a gradual work force integration for community members, starting with shorter workdays and shift rotations (for example, 2-3 days on, followed by a break) to reduce workplace stress and minimize the potential for lateral violence, burnout, and community tensions.
- Owner / operator to implement Diversity, Equity, and Inclusion hiring policy which can contribute to a more balanced work force and reduce the risks of harassment in male-dominated work environments.

9.5.6.3.10.3 Predicted Residual Effects

Drivers License

No adverse residual effects are anticipated, provided mitigation measures are implemented to support community acquisition of Driver's Licences.

Road Safety

Even with mitigation measures, likelihood is **probable** that the increased traffic during construction could lead to an increased risk of accidents. This could include serious incidents such as trucks or heavy equipment breaking through the ice on the winter road. These **negative** effects are anticipated to be **moderate** in magnitude, **infrequent**, **reversible**, **short-term**, with **low uncertainty**, given the limited duration of the winter road use during construction.

Emergency Services

Even with the proposed mitigations, it is **possible** there will be **negative** effects, increasing pressure on emergency services within the Local Study Area. With proper onsite emergency management, including onsite medical personnel and coordination with local emergency services, major disruptions to emergency response in Marten Falls First Nation and Aroland First Nation are not expected. However, despite the presence of onsite medical staff, certain injuries or health concerns may still require transport to community health facilities in Marten Falls First Nation. This could lead to short-term increases in demand for the local nursing station and medevac services. While mitigation measures will reduce workplace injuries, some serious cases may still require evacuation to regional hospitals, such as Thunder Bay. This may place some additional demand on local emergency response and coordination services, though

effects are expected to be **moderate** and **infrequent**. These pressures are expected to be **local, short-term, reversible,** with **low uncertainty**.

Violence and Harassment

While mitigation measures will reduce risks of violence, harassment, and family strain, they may not eliminate them entirely for Local Study Area communities, Indigenous communities with interests in the Local Study Area or for regional municipal communities of Thunder Bay and Greenstone. It is **possible** that **negative** residual effects are expected to include occasional workplace conflicts, ongoing family stress from shift work, and potential lateral violence due to economic disparities, with **low uncertainty**.

Predicted residual effects after mitigation include:

- Violence and harassment between workers and community members is expected to be low risk after mitigation. Work camps will limit direct interactions between works and the community, and mandatory training will promote respectful behaviour, but occasional conflicts may still occur.
- Lateral violence within the community may persist at a low to moderate levels, with some individuals feeling excluded from economic opportunities, potentially leading to resentment and social tensions.
- Workplace harassment and discrimination will be reduced but not entirely eliminated. Training and zero-tolerance policies will help prevent incidents, but ongoing oversight and enforcement will be needed to address any incidents.
- Family and relationship strain due to shift work may lead to stress-related conflicts. Although shorter shifts and financial literacy training may help, prolonged separations may still cause tension within households, potentially increasing domestic disputes.
- Emotional strain and burnout among workers may continue despite mental health supports. On-site Elders, cultural liaisons, and peer support programs will provide relief, but the demanding nature of construction work, isolation in work camps, and shift work pressures may still contribute to stress-related conflicts or frustration-driven workplace tensions

Continued investment in mental health, family support, and economic opportunities will be essential for long-term well-being. With sustained collaboration between the community and owner / operator, these effects can be managed over time as they are anticipated to be **local, short-term, moderate** in magnitude and **reversible**.

9.5.6.3.11 Biophysical Determinants to Human Health

9.5.6.3.11.1 Potential Effects

A summary of contaminant release during construction and their potential to affect the environment influencing human health has been included for each biophysical indicator.

For the purpose of this assessment, changes to the quality of the environment where country foods are harvested will be used to evaluate the potential residual effects associated with project-related activities that may affect the quality of these foods. Biophysical determinants to human health may be affected by chemical exposures through the consumption of contaminated country foods, depending on the type, magnitude, and frequency of exposure. Further information on potential effects is included in the Problem Formulation in **Appendix T** of Community Well-Being Technical Support Document [Appendix T].

Air Quality

A summary of contaminant releases during construction and their potential to affect the environment influencing human health include:

- Potential effects on human health may result from chemical exposures through the inhalation of volatile contaminants, particulate material, and the ingestion of inhaled dust. Air quality will be affected during the construction of the Project. Chemicals of particular concern for air quality include nitrogen dioxide, total suspended particulates, particulate matter less than 10 micrometers, particulate matter less than 2.5 micrometers, sulphur dioxide, carbon monoxide, acrolein, benzo(a)pyrene, diesel particulate matter and dust deposition. Construction activities that may affect air quality include:
  - Quarry blasting and operation
  - Burning and clearing
  - Bridge building
  - Community Access Road construction
  - Aggregate operations
  - Emissions of volatile substances (such as, burning of fossil fuels in vehicles and equipment)

Noise and Vibration

A summary of exposure during construction and their potential to affect the environment for noise and vibration influencing human health include:

- Biophysical human health may be affected by exposure to noise and vibration. Noise represents a distinct environmental change, as it introduces energy into air. Prolonged exposure to noise can lead to sleep disturbances and long-term high annoyance. Human responses to noise vary by individual sensitivity, the type of noise, and specific situations. The most common community reactions to noise include complaints and heightened annoyance. Construction activities that may affect noise and vibration include:
- Project construction activities including clearing, grading, earthmoving, grubbing, and stockpiling;
- Temporary access road reclamation and decommissioning;
- Construction of infrastructure including access roads, bridges, temporary laydown areas, turn-around areas and temporary construction camps; and
- Pit and quarry work.

Soil Quality

A summary of contaminant releases during construction and their potential to affect the environment for soil quality influencing human health include:

- Construction activities that may affect soil quality include:
  - Leaks and spills during equipment, supplies and personnel mobilization; and
  - Deposition of dust and air contaminant emissions from construction, blasting and mobilization activities.

Sediment Quality

A summary of contaminant releases during construction and their potential to affect the environment influencing human health include:

- Potential effects on human health may be affected from chemical exposures through the consumption of contaminated water or through dermal absorption (through the skin) during recreational activities, bathing, or other direct contact. Construction activities that may affect sediment quality include:
  - Clearing the right-of-way for the Community Access Road and supporting access roads;
  - Quarry blasting;
  - Construction of the Community Access Road;
  - Construction and installation of bridges and culverts; and
  - Construction and operations and decommissioning of temporary infrastructure.

Land Use

A summary of contaminant releases during construction and their potential to affect the environment influencing human health include:

- Potential effects on human health may be affected from chemical exposures through the consumption of contaminated water or through dermal absorption (through the skin) during recreational activities, bathing, or other direct contact. Volatile substances in water may be inhaled during activities such as bathing and cooking. Construction activities that may affect surface water quality include:
  - Clearing the right-of-way for the Community Access Road and supporting access roads;
  - Quarry blasting;
  - Construction of the Community Access Road;
  - Construction and installation of bridges and culverts; and
  - Construction and operations and decommissioning of temporary infrastructure.

Peatlands

A summary of contaminant releases during construction and their potential to affect the environment for peatlands influencing human health include:

- Within the Local Study Area, peatlands are existing sources of carbon dioxide and methane. Construction activities will remove portions of the wetland, reducing the amount of carbon dioxide and methane released by natural processes. Peatlands Technical Support Document (Appendix I).

Accidents and Malfunctions

A summary of contaminant releases during construction and their potential to affect the environment influencing human health include:

- Accidents and malfunctions can affect the quality of soils, sediment, surface water and groundwater, and therefore Country Foods. Potential effects on human health may be through chemical exposures through the consumption of contaminated water or through dermal absorption (through the skin) during recreational activities, bathing, or other direct contact. Construction activities which may affect soil, sediment, surface water and groundwater quality include:
  - Clearing the right-of-way for the Community Access Road and supporting access roads;
  - Blasting rock;

- Construction of the Community Access Road;
- Construction and installation of bridges and culverts; and
- Construction and decommissioning of temporary infrastructure.

9.5.6.3.11.2 Mitigation and Enhancement Measures

Mitigation measures to address biophysical factors influencing human health during construction include:

- Owner / operator to obtain all required permits, authorizations, and approvals prior to conducting specific construction activities.
- Owner / operator must comply with all applicable regulations, legislation, permit requirements, and best practices regarding all work.
- Owner / operator to develop and comply with Project specific Management and monitoring plans, including, but not limited to, a Construction Best Management Practice Plan, Blasting and Communication Management Plan, Erosion and Sediment Control Plan, Fugitive Dust Management Plan.
- Owner / operator should plan timing of construction activities to minimize environmental effects.
- An additional mitigation measure is also recommended to mitigate effects on human health:
  - The owner / operator to establish working groups with Marten Falls First Nation, Aroland First Nation, and other interested Indigenous communities from the Regional Study Area, including Animbiigoo Zaagi'igan Anishinaabek, Attawapiskat First Nation, Constance Lake First Nation, Fort Albany First Nation, Ginoogaming First Nation, Kashechewan First Nation, Long Lake #58 First Nation, and Neskantaga First Nation, to meet regularly to discuss community-proposed topics in relation to the construction of the Community Access Road, including concerns related to the biophysical effects on human health during construction, such as air, noise and vibration, sediment, soil, ground and surface water, and human land-use.

9.5.6.3.11.3 Predicted Residual Effects

To determine the magnitude and extent of residual effects of project construction activities on biophysical human health requires the modelling of predicted concentrations based on expected Project activities. For this Project, air concentrations during construction were the only aspect modelled. Residual effects to surface water, groundwater, soils, and sediment, including deposition of dust onto surface water soils

and sediment, were not fully evaluated in the individual technical studies, and modelling was not completed, and as a result, not all biophysical determinants residual effects characterizations can be predicated.

With the information available, the following adverse residual effects are predicted:

Air Quality - Possible, continuous, negative effects on air quality of high magnitude limited to the Construction Disturbance Area are predicted with high uncertainty. However, the air quality assessment determined no significant residual effects to human health, due to reversible and short-term duration of air quality effects from construction activities.

Noise and Vibration - Certain, negative effects of high magnitude due to blasting, quarrying, road construction noise are predicted residual effects, with low uncertainty. However, the noise and vibration assessment determined no significant residual effects to human health during construction as effects are predicted to be short-term and infrequent, reversible and limited to the Construction Disturbance Area. Additional details related to mitigations during construction can be found in the individual technical support documents.

9.5.6.4 Residual Effects – Operations Phase

9.5.6.4.1 Sustainable Population Growth

9.5.6.4.1.1 Potential Effects

Age Distribution

With the Community Access Road operational, improved transportation and access to services is likely to have the **positive** effect of gradually leading to a more balanced age distribution. Improved transportation access will make it easier for families to travel for employment, education, and services without permanently relocating. The road will not only improve local job opportunities but also allow parents to visit their high-school-aged children more frequently and at a lower cost, reducing disruption to family life.

For older adults, the road will enhance access to medical care, reducing the need for long-term relocation to urban areas. In remote communities, limited healthcare often forces Elders to move closer to hospitals and long-term care facilities. With year-round road access, individuals can travel for medical appointments and return home, leading to increased Elder retention and growing demand for in-community healthcare and Eldercare services.

All potential effects may contribute to a gradual shift from the current youth-dominated demographic toward a more balanced age distribution of children, working-age adults, and senior individuals. This predicated shift toward national or regional norms could support future community growth, economic development, and intergenerational knowledge transfer.

Community Population

The operation of the Community Access Road is expected to have a **positive** effect of increasing the community population in Marten Falls First Nation, Aroland First Nation and regional municipal communities of Thunder Bay and Greenstone. Engagement feedback indicates that some off-reserve members are interested in returning once year-round access is established. The new road access may attract both off-reserve members and external workers seeking employment in road maintenance, infrastructure development, and new businesses to Indigenous and regional municipal communities in the region. Families may be more likely to remain in these communities as their children reach high school age, as the road will allow for easier travel to visit students instead of requiring permanent relocation. Over time, this could lead to a stronger community identity and improved social cohesion as residents are able to live closer to family, traditional lands, and cultural resources.

9.5.6.4.2 Labour Market Dynamics

9.5.6.4.2.1 Potential Effects

Labour Force

Operations and maintenance spending is expected to total $11 million on average per year. As shown in the table below, about 30 direct jobs are expected to occur in Ontario during operations on average per year, which along with indirect and induced employment effects would result in about 80 jobs overall. This could lead to about 10 jobs in the rest of Canada, with a total of 90 jobs in Canada overall. These jobs can be filled with the existing labour force in Marten Falls First Nation, as well as the surrounding communities and districts.

These employment effects are expected to directly create about $2.0 million in Ontario's labour income, along with an indirect effect of $2.7 million and an induced effect of $0.8 million. This implies a total labour income effect of $5.5 million and an average labour income of around $68,200 per job. For Canada overall, the total labour income effect is $6.1 million, which gives an average labour income of about $68,300 per job. The expected total effect on Ontario's Gross Domestic Product is $9.9 million. This implies an average income produced of about $123,600 per job. On the other hand, the

expected total effect on Canada's Gross Domestic Product is about $11.2 million, which implies an average income produced of $125,600 per job.

Operations of the Community Access Road is anticipated to create a **positive** effect on educational attainment for Marten Fall First Nation. Road connectivity may support children pursuing secondary education in regions such as Geraldton or Thunder Bay.

Indirect effects related to labour market dynamics include:

- Indirect input-output effects are expected across the supply chain industries. When demand for a specific product or service increases, the industries supplying the necessary materials, labour, or support services also experience growth.
- Other general indirect effects could arise from people moving back to the community given the increase in economic activity and jobs. This increase in population and income would lead to higher demand, including the demand for housing.

9.5.6.4.2.2 Predicted Residual Effects

Labour Force

There are no significant adverse residual effects for the labour market dynamics during operations. There are potential **positive** residual effects on labour market dynamics through increased employment and training opportunities during operations.

Earnings

There are no significant adverse residual effects for the labour market dynamics during the operations.

Educational Attainment

Operations of the Community Access Road is anticipated to create a **positive** effect on educational attainment for Marten Fall First Nation.

9.5.6.4.3 Economy

9.5.6.4.3.1 Potential Effects

Local Businesses and Commercial Activities

Operations presents an ongoing opportunity for business development related to road operations. There could be potential services created during operations, such as establishing a community transportation system (shuttle bus or van), designed to

transport community members to medical appointments, grocery shopping, recreational opportunities and to ship goods and materials. This service would provide flexibility in scheduling, allowing for more efficient and reliable access to and from the community, and better coordination for essential travel needs. At the same time; however, barriers to new or expanding business opportunities during operations may still exist.

Indirect effects related to local businesses include:

- Indirect input-output effects occur in the supply chain due to industry linkages. When demand for a specific product or service increases, the industries supplying the necessary materials, labour, or support services also experience growth. If there is higher direct demand for some product in the economy, then the businesses in the industries supplying that product are indirectly affected.
- Other general indirect effects could arise from people moving back to the community given the increase in economic activity and jobs. This increase in population and income would lead to higher demand, including the demand for housing.

Public Finances

Considering all the economic activity across Canada, the total effect on tax revenue is expected to be $3.0 million during the operation phase. This is led by taxes on income ($2.0 million), mostly at the federal level ($1.2 million). Taxes on products are projected to be $0.6 million, with approximately half of that going to the local government, while taxes on production are expected to total $0.5 million, with $0.3 million going to the local government.

Indirect effects related to public finances include:

- Indirect effects occur in the supply chain due to industry linkages. When demand for a specific product or service increases, the industries supplying the necessary materials, labour, or support services also experience growth. If there is higher direct demand for some product in the economy, then the industries supplying that product are indirectly affected, which then leads to additional tax revenues.
- Other general indirect effects could arise from people moving back to the community given the increase in economic activity and jobs. This increase in population and income would lead to higher demand, including the demand for housing.

Regional Economy

Summary of the regional economic effects of the $11 million operation spending is shown in **Table 9.5-30** and **Table 9.5-31**, followed by sections for each economic indicator.

Table 9.5-30: Ontario Operation and Maintenance Effects

Ontario Operation and Maintenance Effects (millions of dollars)	Direct Effects	Indirect Effects	Induced Effects	Total Effects
Output	11.0	8.4	3.0	22.4
Gross Domestic Product	3.6	4.3	2.0	9.9
Labour Income	2.0	2.7	0.8	5.5
Gross Operating Surplus	1.5	1.5	0.9	3.9
Taxes on Products	0.1	0.1	0.3	0.5
Taxes on Production	0.2	0.2	0.2	0.5
Taxes on Income	0.6	0.8	0.3	1.7
Employment (jobs)	27	39	14	80

Source: Statistics Canada, 2026d, 2026e, 2026f, AECOM Analysis.

Table 9.5-31: Canada Operation and Maintenance Effects

Canada Operation and Maintenance Effects (millions of dollars)	Direct Effects	Indirect Effects	Induced Effects	Total Effects
Output	11.0	10.0	3.8	24.8
Gross Domestic Product	3.6	5.1	2.5	11.2
Labour Income	2.0	3.1	1.0	6.1
Gross Operating Surplus	1.5	1.9	1.1	4.5
Taxes on Products	0.1	0.1	0.3	0.6
Taxes on Production	0.2	0.2	0.2	0.5
Taxes on Income	0.6	0.9	0.4	2.0
Employment (jobs)	27	45	17	89

Source: Statistics Canada, 2026d, 2026e, 2026f, AECOM Analysis.

Output

As per **Table 9.5-30**, the $11 million operation and maintenance spending is expected to lead to total economic activity (output) in Ontario of $22.4 million on average per year. The total effects on output are estimated to be $24.8 million for Canada (**Table 9.5-31**).

Gross Domestic Product

As per **Table 9.5-30** Ontario's total economic value, measured by its Gross Domestic Product (income produced), is projected to be $9.9 million annually. Meanwhile, the

total effects on Canada's Gross Domestic Product are expected to be $11.2 million (**Table 9.5-31**).

Labour Income

As per **Table 9.5-30**, total effects on labour income are expected to be $5.5 million per year in Ontario. The total effects on Canada's labour income are estimated to be $6.1 million, with approximately half of those coming from the indirect effects (**Table 9.5-31**).

Gross Operating Surplus

As per **Table 9.5-30**, Ontario's gross operating surplus total effect is estimated to be $3.9 million annually. The estimated total effects on gross operating surplus are expected to be $4.5 million, with the indirect effects being the most dominant.

Taxes

As per **Table 9.5-30**, the total effects on taxes in Ontario ($2.7 million) are led by taxes on income ($1.7 million), followed by taxes on products ($0.5 million) and taxes on production ($0.5 million). The total effects on taxes in Canada are estimated to be $3.0 million (**Table 9.5-31**). This is led by taxes on income ($2.0 million), followed by taxes on products ($0.6 million) and taxes on production ($0.5 million).

Employment

Operations is expected to engage about 80 total jobs in Ontario, which includes around 30 direct jobs. The overall employment effect for Canada is expected to be around 90 jobs, with the indirect effects on employment being most prominent.

Indirect effects related to the regional economy include:

- Indirect input-output effects occur in the supply chain due to industry linkages. If there is higher direct demand for some product in the economy, then the industries supplying that product are indirectly affected. In the context of the Project, the operating spending for the new Community Access Road directly affects the support activities for transportation industry. The support activities for transportation industry makes the first round of indirect expenditures on its supply chain industries. Those industries will then make their expenditures on their supply chain industries. The sum of all those indirect effects gives the total indirect effects, as discussed earlier.

9.5.6.4.3.2 Mitigation and Enhancement Measures

Local Businesses and Commercial Activities

Mitigation measures to address potential business environment issues include:

- Owner / operator will implement Community Readiness Strategies and Adaptive Management Plans to assess and respond to community needs through construction and prepare for operations.
- Owner / operator will create a Local Content Plan to utilize a certain dollar value or share towards local businesses and contractors for operations.

Enhancement measures focused on improving the business environment include:

- Owner / operator should prioritize hiring Marten Falls First Nation and Aroland First Nation members, as well as other Indigenous community members.

9.5.6.4.3.3 Predicted Residual Effects

Local Businesses and Commercial Activities

There are no adverse residual effects for the business environment during the operations. Possible **positive** residual effects are anticipated on the economy through potential productivity improvements, land value uplift, and higher economic diversification.

Regional Economy

There are no significant adverse residual effects for the regional economy during operations. Possible **positive** residual effects are anticipated on the business environment through potential productivity improvements and higher economic diversification.

9.5.6.4.4 Community Access to Infrastructure and Services

9.5.6.4.4.1 Potential Effects

Methods of Transportation In and Out of the Community

The construction of a permanent Community Access Road will eliminate the Marten Falls First Nation's reliance on the seasonal winter road, which is limited by climate variability and short operational periods. Year-round access will eliminate reliance on flight schedules and the limited winter road, improving the predictability of available travel means for essential services, education, and employment opportunities. This will result in a **positive** effect of reliable, year-round, all-season road-access for people and

goods, increasing supply delivery and reducing the community's dependency on costly air transport.

The road will also reduce dependence on air transportation, having the indirect positive effect of improving access to goods, services, and supplies. Year-round road access will reduce travel costs considerably for community members, particularly families. With one tank of gas costing between $100-$200, compared to up to $2,120 for return flights for a family of four using ZAM Air out of Nakina, or $4,000 using North Star Air from Thunder Bay, the road provides major financial savings. The ability to make day trips to nearby towns like Geraldton or Nakina also eliminates the need for overnight accommodation costs. Road access also reduces the travel costs for out-of-community healthcare appointments, reducing this community cost. Food prices are also expected to decrease, easing the financial strain on community members, especially lower-income residents, who may otherwise face limited access to affordable, nutritious food. Reduced costs may help alleviate food insecurity, improve overall health outcomes, and support community well-being. For example, as of 2025, the price of a 10 kg bag of flour at Superstore in Thunder Bay ranges from $10.99 to $18.97, and $15.97 for a 10 kg bag of sugar. In contrast, communities like Neskantaga First Nation (and based on similar remote location to Marten Falls First Nation we can assume prices are similar) were paying $40 to $70 for a 10 kg bag of flour and $30 for sugar in 2023. These major price differences highlight the financial strain on community members, particularly lower-income residents, who are already facing limited access to affordable food options.

While these savings represent a direct positive benefit to all community members, members of the Gender-Based Analysis Plus groups, such as youth, single parents, lower-income earners, and Elders, will particularly feel the **positive** effects.

No direct effects on methods of transportation in or out of Aroland First Nation are anticipated.

Essential Infrastructure and Services

The road will have a **positive** effect of facilitating easier access for owner / operators and service providers, improving the local delivery of key services, such as healthcare, education, and community-based programs, potentially enhancing the availability and quality of these services for both current and new residents.

The road's development may have an indirect **positive** effect of reducing the logistical challenges and costs associated with transporting building materials and equipment, making it more cost-effective to service and expand local infrastructure. This could lead to faster development, including the expansion of essential infrastructure including power, water, wastewater, or education facilities.

9.5.6.4.4.2 Predicted Residual Effects

Methods of Transportation In and Out of the Community

Residual effects on transportation methods in and out of the community are expected to be **positive**.

Essential Infrastructure and Services

The residual effects on essential infrastructure and services are expected to be **positive,** given increased ease of access for service providers and reduced friction associated with infrastructure upgrades or improvements.

9.5.6.4.5 Housing

9.5.6.4.5.1 Potential Effects

Housing Suitability

The improved access from the Community Access Road may lead to a short-term, effect of decrease in housing suitability, as off-reserve residents and potential new residents choose to live in Marten Falls. This influx of new, permanent residents will put pressure on existing supply in Marten Falls which could disproportionately affect women, children, and Elders, particularly in overcrowded or substandard conditions. Women, especially those in single-parent households, may face added challenges managing limited space and resources.

Housing Adequacy

The Community Access Road will contribute to the **positive** effect of reduced costs and logistically challenges associated with building new homes and shipping materials to Marten Falls First Nation, improving the amount of adequate housing within the community.

Improved housing adequacy is expected to contribute to an indirect **positive** effect of improved health due to reduction in mold, poor ventilation, and overcrowding. This can lower the incidence of respiratory illnesses and other health problems often worsened by inadequate housing. The long-term benefits will include better mental health, particularly for women and children who are often the primary caregivers and spend the most time at home. Women, who are more likely to be responsible for maintaining the household environment, will experience improved health outcomes due to a healthier living space. Additionally, Elders, who may have more sensitive health conditions, will benefit from better air quality and safer living conditions.

Access to Building Materials for Housing

The Community Access Road will contribute to a **positive** effect of improving reliable access to construction materials and supplies, allowing more frequent repairs, upgrades, and construction of new homes. With continuous access to materials, repairs can be completed proactively, preventing them from escalating into larger issues. The availability of materials will help address long-standing housing needs within the community, improving living conditions for residents, particularly women, children, and Elders, who are more vulnerable to substandard housing.

While the Community Access Road will likely lower the cost and logistical barriers to transporting building materials, the community's existing infrastructure such as electricity, wastewater treatment, and access to clean drinking water, is already at capacity and would need upgrades to support future housing growth. To fully realize the benefits of improved transportation, an infrastructure review and planning process would be beneficial to identify and prioritize necessary upgrades. While responsibility for such planning falls outside the scope of the road project, Marten Falls First Nation may consider working with Indigenous Services Canada and other partners to explore opportunities for infrastructure investment and long-term community development.

There are no effects to housing anticipated for Aroland First Nation from the operations of the road as it is already road-connected year-long.

9.5.6.4.5.2 Mitigation and Enhancement Measures

Mitigation measures to meet changes in housing needs throughout operations include:

- Owner / operator to establish working groups with Marten Falls First Nation and Aroland First Nation to meet regularly to discuss community-proposed topics in relation to the Community Access Road, including topics associated with housing, such as tracking of housing demand and local infrastructure adjustments to meet changes in housing needs. This could include converting housing from the autonomous work camps as additional, permanent housing.

9.5.6.4.5.3 Predicted Residual Effects

There are no adverse residual effects associated with housing during operations.

There are no residual effects expected for Aroland First Nation for housing from the operations of the road.

9.5.6.4.6 Cultural Preservation and Change

9.5.6.4.6.1 Potential Effects

Traditional Economy

With the road in place, new harvesting areas may become accessible for Marten Falls First Nation and Aroland First Nation, which could have the **positive** of effect of renewing interest among youth and younger adults in participating in the Traditional Economy. Previously, access would have been limited to snowshoe, snowmobile, all-terrain vehicles, canoe, or boat, transportation options that require more time and potentially more safety concerns compared to using the new all-season road.

From a Gender-Based Analysis Plus perspective, the increased ability to easily access to hunting, fishing, trapping, and gathering areas is expected to have a **positive** effect, as it may encourage more youth and younger adults to engage in traditional activities. Easier access would reduce travel time to these locations, allowing community members to participate in traditional practices while balancing work or school commitments. For Elders and those with mobility challenges, the road provides an opportunity to reconnect with traditional activities like fishing, berry picking, and medicinal gathering, which may have been difficult to reach without this improved infrastructure.

Easier transportation of traditional foods may have a **positive** effect of creating new economic opportunities, such as selling fish, berries, and wild meats and other traditional goods, such as harvested berries, fish, and furs, to external markets. The road will also allow for increased trade or business partnerships between Marten Falls First Nation and Aroland First Nation, helping continue to build a strong relationship between the two communities.

The potential **positive** effects associated with the traditional economy may positively affect the road-connected Indigenous communities with overlapping interests in the Local Study Area, including Constance Lake First Nation, Ginoogaming First Nation, and Long Lake #58 First Nation.

The potential **positive** effects associated with the traditional economy are not anticipated to affect the remote Indigenous communities with overlapping interests in the Local Study Area, including Neskantaga First Nation, Animbiigoo Zaagi'igan Anishinaabek, as they will not experience a change in accessibility.

Participation in Cultural Activities

The road will have a **positive** effect of increasing access for off-reserve members to attend cultural events such as pow wows, community feasts, and cultural weeks, in Marten Falls First Nation. Members of Marten Falls First Nation and Aroland First Nation expressed excitement that the road would increase their ability to attend traditional gatherings and pow wows in Marten Falls First Nation, noting that driving to the community would save a lot of money on flights. The road may encourage increased participation by Marten Falls First Nation members in activities in Aroland First Nation, as there will be a road connecting the communities. Nations collaborating to host and celebrate events may further strengthen the relationship between the communities, strengthening inter- and intra-community cohesion. Finally, improved access may increase participation in cultural education from off-reserve community members and make it easier for Elders and knowledge keepers that reside off-reserve to travel to the community strengthening intergenerational knowledge sharing. Younger community members may become more engaged and invested in learning and preserving cultural practices.

Use of Traditional Language

According to the 2021 Census, the percentage of Ojibway speakers in Marten Falls First Nation declined from 22 percent in 2016 to 18 percent. In contrast, the percentage of Ojibway speakers in Aroland First Nation increased from 35.6 percent in 2016 to 36.1 percent in 2021. With a lower population than Aroland First Nation, reasons for decreased traditional language use in Marten Falls First Nation may include out-migration, aging fluent speakers, fewer opportunities for language transmission, or Census data variability.

The road could increase interactions between Indigenous communities and traditional language users, particularly between Marten Falls First Nation and Aroland First Nation. This may lead to more opportunities for community members, particularly youth, to hear and practice the language and resulting in a **positive** effect of increased traditional language use.

9.5.6.4.6.2 Mitigation and Enhancement Measures

Participation in Cultural Activities

No mitigation measures are proposed.

Enhancement measures for participation in cultural activities include:

- Owner / operator to consider sponsoring community-driven cultural events that can take advantage of the improved access, incorporating local and regional participation. The road can help bring in off-reserve members, including those residing in Aroland, Municipality of Greenstone, Thunder Bay, and other communities, enriching the event experience without overshadowing the values of the community, and potentially strengthening the cultural values of both on- and off-reserve members. This could include festivals, gatherings, or knowledge-sharing initiatives that use the road as a tool for cultural exchange, and organization of traditional events like canoe races, fishing trips, or nature walks, that use the road as a tool to deepen the connection to the land and water.
- Owner / operator to consider sponsoring Elders and Indigenous Knowledge holders to travel to Marten Falls First Nation to provide cultural programming that may include workshops on teaching traditional skills related to hunting, trapping, traditional music, storytelling, or preparation of traditional foods.

Use of Traditional Language

Enhancement measures for language use include:

- Owner / operator or road owner to consider sponsoring Elders and knowledge holders that reside outside the community travel to community to teach the language to interested community members, through formal and informal settings.

9.5.6.4.6.3 Predicted Residual Effects

Traditional Economy

Residual effects for participation in the traditional economy are expected to be **positive**.

Participation in Cultural Activities

Residual effects for participation in cultural activities are anticipated to be **positive**.

Use of Traditional Language

Residual effects for change in use of traditional language is anticipated to be **positive**.

9.5.6.4.7 Community and Public Health

9.5.6.4.7.1 Potential Effects

Access to Health Services

The Community Access Road to Marten Falls First Nation is expected to have **positive** effects on access to health services due to reliable, year-round connection by an all-season road for both community members to access services only available in other regional centres and, for more reliable delivery of services in community.

Recreation

The Community Access Road to Marten Falls First Nation is expected to have **positive** effects on recreation, including youth sporting activities, cultural events, and other leisure activities, due to reliable, year-round connection by an all-season road for both community members to more easily engage in recreational activities outside the community and, to increase the planning and participation in recreational activities within the community year-round.

Mental Health and Well-being

The Community Access Road to Marten Falls First Nation is expected to have **positive** effects on mental health by improving access to care, reducing isolation, and enhancing opportunities for cultural and social engagement, including improved access to medical health services, faster response for mental health crises, reduced feelings of isolation, and improved effect on mental health and well-being.

The road will reduce logistical challenges in accessing mental health care, including counseling, addiction treatment, and crisis support services in regional centres such as Sioux Lookout and Thunder Bay. Currently, medical transportation for mental health services is limited by the availability of flights and the need for advanced planning. The road will allow for more timely access to appointments and emergency psychiatric care, reducing delays in treatment. The road will enable faster emergency interventions by allowing regional crisis teams paramedics, and police services to reach the community more efficiently, potentially preventing self-harm or overdose fatalities. Given the high rates of mental health service calls in the Nishnawbe Aski Police Service Central Region (404 calls related to mental health or suicide attempts in 2023-2024), reducing response times will be critical to community well-being.

Isolation has been a longstanding challenge in Marten Falls First Nation, contributing to mental health concerns such as depression, anxiety, suicide, and substance abuse. The road will allow community members to visit out-of-community family members,

participate in cultural events outside the community, and connect with external networks, without relying on expensive flights in and out of the community. This may increase social interaction and reduce feelings of disconnection.

The road removes transportation barriers to accessing mental health services, reducing emergency response times, potentially improving out-of-community social connections, and increasing participation in cultural practices, which contributes to overall improvements in mental health outcomes.

Although the road will enhance access to traditional lands and may support more frequent participation in land-based healing and cultural activities that have been identified as protective factors for mental health, there may also be effects due to the permanent, visual presence of the road contributing to feelings of disconnect and ecological grief. For some community members, the transformation of a familiar environment into a developed corridor may evoke sadness, anxiety, or a diminished sense of belonging, as the road may symbolize a disruption or fragmentation of relationships with the environment.

Indigenous communities with overlapping interests in the Local Study Area, including Constance Lake, Neskantaga, Animbiigoo Zaagi'igan Anishinaabek, Ginoogaming, and Long Lake #58 First Nations, face similar risks and potential negative effects to their mental health and well-being as those identified for Marten Falls First Nation and Aroland First Nation community members. Potential negative effects to mental health and well-being may be experienced due to permanent, visual changes to the land.

Substance Use

The Community Access Road to Marten Falls First Nation may have a effect on substance use within the community. A large percentage of the community (75 percent) is accessing substances despite current transportation limitations. The new all-season road access will reduce costs and logistical barriers for bringing all items, including alcohol and drugs, into the community. This could lead to increased frequency and / or quantity of use among existing users, given the reduced financial and logistical barriers.

While easier access to drugs and alcohol is a concern, the road may contribute to **positive** effects due to improved access to treatment options, providing a more balanced consideration of potential effects. With the road in operation, travel to treatment centres outside of the community and options to bring treatment programs and services to the community will become more affordable, reducing barriers for individuals seeking help for substance use. This could include day programs, counseling services, and follow-up support services, potentially improving long-term recovery outcomes. Service delivery, including access to withdrawal medications like

suboxone, is likely to improve. Community members have historically identified cultural activities as key to substance use prevention, emphasizing the importance of reconnecting with traditions and engaging in recreational, outdoor, and creative pursuits. Increased accessibility through the road can make it easier to access land-based programs while strengthening cultural ties.

It was identified that Marten Falls First Nation is working to build a community treatment centre in the community. The road will improve access to building materials and decrease transportation costs, making the construction of a community-based culturally relevant treatment centre feasible. This facility could integrate traditional healing methods with clinical care, providing a holistic and culturally appropriate recovery environment.

9.5.6.4.7.2 Mitigation and Enhancement Measures

Mental Health and Well-being

Owner / operator to form a Working Group with Marten Falls First Nation, Aroland First Nation, the owner / operator to co-develop a Safety and Wellness Plan that addresses project-related mental health and well-being concerns.

Substance Use

Owner / operator to form a Working Group with Marten Falls First Nation, Aroland First Nation, the owner / operator to co-develop a Safety and Wellness Plan that addresses project-related substance use concerns.

9.5.6.4.7.3 Predicted Residual Effects

Access to Health Services

Residual effects for access to health services are expected to be **positive**.

Recreation

Residual effects for recreation are expected to be **positive**.

Mental Health and Well-being

In general, mental health and well-being effects during operations are anticipated to be **positive** related to increased availability of mental health resources, treatment options, and decreased feelings of isolation. Increased access to care may lead to long-term improvements in mental health outcomes, reduce crisis incidents, reduce substance abuse and increase overall well-being. There is likely to be improvement in mental health resources, crisis response, and overall well-being, supported by evidence of

current service gaps and high crisis call rates, and local as primary benefits will occur within Marten Falls First Nation. This is likely to permanently improve access, reducing isolation and improving mental health outcomes over time, and this will occur on an ongoing basis once the road is operational.

However, mental health effects will not be experienced uniformly across the entire community, and here are **possible negative** residual effects related to a lost feeling of connectivity to land due to social and cultural sensitivities related to sense of place and identity. While the effect may be experienced by some individuals, it is not expected to affect the entire community uniformly and thus magnitude is **medium**. The effect is **local** because it is confined to the areas where construction will be occurring and may be **long-term** and **continuous** because it may persist as long as the road corridor exists. However, it may be **reversible** given increased access to mental-health supports and community and land-based activities. Uncertainty is **high**, because while feelings of ecological grief are relatively well-documented, the extent and intensity of this effect may vary individually.

Substance Use

There are **positive** residual effects expected with respect to substance use due to increased access to addictions treatment services and therapies, alongside increased mental health services.

However, a **possible negative** residual effect, even with mitigation, is the increased access to drugs and alcohol, which could lead to continued increases in substance use in the community. Especially given the increased access to mental health and addictions supports that the road connectivity will bring, the is **reversible** and uncertainty is **high**. Furthermore, increase in substance abuse is not expected to affect the community uniformly and thus magnitude is **medium**. The effect is **local, continuous** and **long-term** because the opportunity to access drugs and alcohol easily may persist as long as the road corridor exists.

9.5.6.4.8 Access to Clean Water

9.5.6.4.8.1 Potential Effects

Access to Clean Water

The Community Access Road will have a **positive** effect on the access to clean water as supply chain reliability will be improved, reducing disruptions in the delivery of essential resources, including clean water. Improved road access will also facilitate more frequent servicing and maintenance of the community's water treatment plant. With easier transportation for technicians, equipment, and materials, there is greater

potential for necessary upgrades and repairs to be completed efficiently. This increased capacity may help the facility reach and maintain operational standards, improving clean water access and reliability for residents.

Quality of Drinking Water

There is a potential for the quality of surface water and ground water to be negatively affected by the operations activities. A full assessment of the quality of surface water can be found in the Problem Formulation for Human Health Risk Assessment (Attachment A). Potential effects on human health may be affected from chemical exposures through the consumption of contaminated water or through dermal absorption (through the skin) during recreational activities, bathing, or other direct contact. Volatile substances in water may be inhaled during activities such as cooking and bathing. Operations activities that could affect quality of surface water include:

- Maintaining the Community Access Road, permanent access roads, bridges and culverts; and
- Operate the Community Access Road and permanent access roads.

Indigenous communities with overlapping interests in the Local Study Area, including Constance Lake, Neskantaga, Animbiigoo Zaagi'igan Anishinaabek, Attawapiskat, Kashechewan, and Fort Albany First Nations, face similar risks and potential negative effects to quality of surface water as those identified for Marten Falls First Nation and Aroland First Nation community members.

9.5.6.4.8.2 Mitigation and Enhancement Measures

Quality of Drinking Water

To mitigate negative effects on drinking and recreational water:

- Owner / operator to establish working groups with Marten Falls First Nation, Aroland First Nation, and other interested Indigenous communities from the Regional Study Area, including Constance Lake, Neskantaga, Animbiigoo Zaagi'igan Anishinaabek, Attawapiskat, Kashechewan, and Fort Albany First Nations, to meet regularly to discuss community-proposed topics in relation to the construction of the Community Access Road, including concerns related to contamination of ground and surface water.

9.5.6.4.8.3 Predicted Residual Effects

Access to Clean Water

Residual effects for access to clean water are expected to be **positive**.

Quality of Drinking Water

Residual changes to surface water quality are possible from the emission and deposition of airborne particulate matter to nearby waterbodies, sediment quality due to changes in land cover, changes in channel hydraulics at waterbody crossings, and wash off of accidental spills and leaks to nearby waterbodies. Indigenous communities with overlapping interests in the Local Study Area, including Constance Lake, Neskantaga, Animbiigoo Zaagi'igan Anishinaabek, Attawapiskat, Kashechewan, and Fort Albany First Nations, face similar risks and potential negative effects to quality of surface water as those identified for Marten Falls First Nation and Aroland First Nation community members.

9.5.6.4.9 Traditional Foods

9.5.6.4.9.1 Potential Effects

The impact of the Community Access Road on traditional foods are explored further in the Aboriginal Treaty Rights and Interests assessment.

Access to Traditional Foods

The operation of the Community Access Road will have a **positive** effect on the accessibility of traditional foods. Key harvesting sites will be more accessible by the all-season road, making it easier for community members to participate in traditional activities such as hunting, trapping, fishing, and plant gathering. Elders and youth, who may currently face challenges reaching traditional lands due to distance or winter road conditions, could find it easier to participate, supporting intergenerational knowledge transfer. Aroland First Nation may benefit from greater access to traditional fishing and berry harvesting sites with the road providing more consistent access to key fishing areas along the Albany River, including Ogoki Falls and Amy Falls, supporting traditional fishing practices. Easier transportation of harvested fish and berries may encourage greater community participation in food-sharing networks. The Aroland Youth Blueberry Initiative could benefit from improved transportation, allowing more youth to participate in harvesting and selling blueberries. Increased access to markets may enhance economic opportunities for community-led food security programs.

The potential **positive** effects associated with the increased accessibility of traditional foods may be experienced by the following road-connected Indigenous communities with overlapping interests in the Local Study Area including Constance Lake First Nation, Animbiigoo Zaagi'igan Anishinaabek, Ginoogaming First Nation, and Long Lake #58 First Nation.

However, the following remote Indigenous communities with overlapping interests in the Local Study Area are not expected to experience any change: Fort Albany First Nation, Attawapiskat First Nation, Kasabonika Lake First Nation, Kitchenuhmaykoosib Inninuwug First Nation, Kingfisher Lake First Nation, Neskantaga First Nation, Nibinamik First Nation, Wapekeka First Nation, Wawakapewin First Nation, Webequie First Nation, Weenusk First Nation, and Wunnumin Lake First Nation.

Availability of Traditional Foods

The operation of the Community Access Road will have an effect on the availability of traditional foods The road will open access to new areas for the general public, increasing access to hunters and fishermen to areas that were previously not easily accessible. Easier, year-round access may lead to a reduction in availability of traditional foods, due to over-harvesting and environmental strain. There may be increased pressure on fish populations on the Albany River, moose hunting, and on berry harvests, supporting the need for sustainable management practices. Members of Marten Falls First Nation have expressed concerns about increased access as higher numbers of outsiders hunting and fishing, which may reduce the availability of traditional hunting grounds (Three Roads Forum, personal communication, Feb 27, 2025).

Road access may increase hunting pressure on game and traditional foods, particularly caribou, which is valued by Aroland First Nation. While caribou hunting is prohibited for the general public in Ontario, Indigenous hunters from outside the region and poachers may contribute to increased harvest. Hunting of birds and other game by the general public could further reduce the availability of traditional foods. There is concern that additional pressure on caribou could lead to a reduction in availability or their disappearance from the region. Road access may also increase hunting pressure on moose, which is valued by Marten Falls First Nation and Aroland First Nation. Increased access to previously remote areas along the Community Access Road may facilitate an increase in access by the general public.

The potential **negative** effects associated with the availability of traditional foods may also be experienced by the regional communities with overlapping interests in the Local Study Area, including Constance Lake, Neskantaga, Animbiigoo Zaagi'igan Anishinaabek, Ginoogaming, and Long Lake #58 First Nations.

Reliance on Store-Bought Foods

The operation of the Community Access Road will have a positive effect on the reliance on store-bought foods. Road transportation is expected to reduce the cost of groceries by lowering shipping costs, making store-bought food more affordable for community members. With fewer transportation delays and a more reliable supply chain, perishable

foods such as fruits, vegetables, dairy, and meats will arrive fresher and in better condition, reducing consumption of near-expired or lower-quality goods. Fewer delays due to flight schedules and weather disruptions could enhance food security and reduce food waste. Access to fresher, higher-quality foods could support improved nutrition and health outcomes, particularly if paired with nutrition education initiatives promoting health food choices.

Aroland First Nation is already road accessible, but there is potential with increased store-bought food shipments to Marten Falls First Nation, that Aroland First Nation may also see increased shipments and supply-chain reliability along the delivery route, which could increase reliance on store-bought foods.

Quality of Traditional Foods

A full assessment of the potential effects to the Quality of Traditional Foods is included in the Problem Formulation for Human Health Risk Assessment (Appendix T). Potential effects that could arise through contaminant releases during operations and their potential to affect the environment influencing human health could result in changes to the Quality of Traditional Foods. The quality of traditional or country foods is closely linked to the health of the surrounding environment. For instance, fish thrive in clean, unpolluted waters, and their health directly affects the safety and nutritional value of the fish consumed. Similarly, berries and other wild fruits depend on clean air and soil to grow robustly, free from harmful contaminants. Wildlife, a common source of traditional meats, requires a healthy and suitable habitat to flourish; polluted environments can lead to diseases and reduced populations. Residual effects of road Operations in surface water, groundwater, air, soils, peatlands, and noise-induced stress can cause contamination to the local and regional environment. When country foods are harvested from contaminated environments, the contaminants can pose a direct risk to those who consume them.

Indigenous communities with overlapping interests in the Local Study Area, including Constance Lake First Nation, Fort Albany First Nation, Attawapiskat First Nation, Kashechewan First Nation, Kasabonika Lake First Nation, Kitchenuhmaykoosib Inninuwug First Nation, Kingfisher Lake First Nation, Eabametoong First Nation, Mishkeegogamang First Nation, Neskantaga First Nation, Nibinamik First Nation, Wapekeka First Nation, Wawakapewin First Nation, Webequie First Nation, Weenusk First Nation, Wunnumin Lake First Nation, Animbiigoo Zaagi'igan Anishinaabek, Ginoogaming First Nation, and Long Lake #58 First Nation, face similar potential negative effects related to the quality and availability of traditional foods as those identified for Marten Falls First Nation and Aroland First Nation.

9.5.6.4.9.2 Mitigation and Enhancement Measures

Mitigation measures for the consumption of traditional foods:

- Owner / operator to establish working groups with Marten Falls First Nation, Aroland First Nation, and other interested Indigenous communities from the Regional Study Area, to meet regularly to discuss community-proposed topics in relation to the construction of the Community Access Road, including discussions about pathways to contamination through traditional foods and opportunities to prevent contamination for example signage related to washing dust off gathered foods.
- Further discussion during detail design between the owner / operator, the project owner to work with Ontario's Ministry of Natural Resources to encourage more frequent patrols of Conservation Officers along the Community Access Road to confirm hunters and fishermen are not exceeding their limits and that they have the proper tags and licenses.
- Owner / operator to work with communities and governments, as required, to support education and development of Indigenous Conservation Officer (Game Warden) program.
- Owner / operator to sponsor community-led harvesting initiatives in Marten Falls First Nation and Aroland First Nation.

Enhancement measures for the consumption of traditional foods:

- Owner / operator to consider sourcing traditional foods for the work camps, where it is possible, to support local harvesters and small businesses.

9.5.6.4.9.3 Predicted Residual Effects

Access to Traditional Foods

Positive residual effects on traditional foods include long-term improved access to harvesting areas, stronger support for traditional food programs and youth initiatives, improving local food security and Indigenous Knowledge transmission.

Availability of Traditional Foods

Possible negative residual effects on availability traditional foods include a **local** decrease in availability of traditional food resources, due to disruption from the road itself or the result of increased harvesting due to increased access. While this effect may be of **moderate** magnitude, **local** and **long-term**. This effect may be **infrequent and reversible, and has a high** uncertainty.

Reliance on Store-Bought Foods

Positive effect of increased access to store-bought foods as a result of reduced costs due to less-expensive road transport.

Quality of Traditional Foods

The quality of fish, vegetation, wildlife, birds, and ungulates as a traditional food is dependent on the quality of their habitat or namely the surface water, air and soil quality to which they are exposed. Effects from soil contamination leaching, emissions of criteria air contaminants and deposition to surface water, changes to erosion and sedimentation, changes to surface water quality, dust deposition, and increased public access to fish have the potential to affect the quality of fish, vegetation, wildlife, birds, and ungulates as country foods and potentially affect human health.

These negative residual effects on the availability and quality of traditional foods apply to the Indigenous communities with overlapping interests in the Local Study Area, including Constance Lake First Nation, Fort Albany First Nation, Attawapiskat First Nation, Kashechewan First Nation, Kasabonika Lake First Nation, Kitchenuhmaykoosib Inninuwug First Nation, Kingfisher Lake First Nation, Eabametoong First Nation, Mishkeegogamang First Nation, Neskantaga First Nation, Nibinamik First Nation, Wapekeka First Nation, Wawakapewin First Nation, Webequie First Nation, Weenusk First Nation, Wunnumin Lake First Nation, Animbiigoo Zaagi'igan Anishinaabek, Ginoogaming First Nation, and Long Lake #58 First Nation, face similar potential negative effects related to the quality and availability of traditional foods as those identified for Marten Falls First Nation and Aroland First Nation.

9.5.6.4.10 Public Safety

9.5.6.4.10.1 Potential Effects

The operations the Community Access Road to Marten Falls First Nation is expected to influence public safety, including licenced driving, road safety, access to emergency services and experiences of violence and harassment.

Driver's Licence

During operations, there is potential for increased employment opportunities. As during construction, a valid driver's license will help enable Marten Falls First Nation and Aroland First Nation residents to access direct and indirect jobs related to the operations of the Community Access Road, such as equipment operation, truck driving, delivery services, and potentially community shuttles. The lack of a driver's license may limit access to training programs related to direct or indirect jobs related to the

operations of the Community Access Road, as some training programs may require a valid driver's license as a prerequisite. This could limit the ability of residents to qualify for certain roles during operations, potentially effecting their opportunities to take full advantage of training and employment opportunities.

The absence of a driver's license, due to barriers to successfully completing a driver's licence assessment or difficulties accessing required documentation, could limit community member's ability to gain the necessary qualifications for employment opportunities, ultimately restricting the benefits of the project to the community. Unless barriers are addressed, there is likely to be the negative effect that demand for workers with Driver's licences exceeds those available, thereby limiting the community benefits of the Project.

Road Safety

During the operations phase, the Community Access Road is expected to have higher traffic volumes compared to the winter road and therefore likely an effect on road safety due to increased number of road-related injuries and accidents.

It is important to distinguish that, on a per-kilometre basis, the Community Access Road is expected to provide safer and more predictable driving conditions, reducing risks associated with weak ice, poor construction, and inadequate signage. The Community Access Road will be built to mandatory technical and safety standards, unlike the winter road, which follows voluntary guidelines. The new road will offer consistent safety standards year-round, unlike the winter road, where conditions fluctuate daily. While these improved road conditions may reduce the risk per vehicle, the overall number of accidents is likely to increase due to the higher number of vehicles / increased frequency of trips. As a result, the existing road near Aroland First Nation may also see a higher frequency of collisions and traffic-related incidents. Furthermore, the barriers to obtaining driver's licenses and vehicle registration may continue to be an issue for some Marten Falls First Nation and Aroland First Nation residents. Without these, drivers may be at higher risk for accidents and non-compliance with the Highway Traffic Act.

Additionally, the perceived reliability of the Community Access Road may encourage higher speeds and may lead to overconfidence in dangerous conditions (for example, driving in poor weather without proper precautions) potentially increasing opportunities for accidents and more high-speed collisions. Easier access to drugs and alcohol may also contribute to increased driving incidents. Clear signage and speed limits, as well as consistent enforcement of traffic laws will help mitigate dangerous driving behaviours, reduce total number of accidents, and support road safety.

The effect on road safety due to increased number of road-related injuries and accidents may also be experienced outside the Local Study Area, by regional municipal communities of Thunder Bay and Greenstone.

Access to Emergency Services

The Community Access Road is expected to have a **positive** effect on access to emergency services as it will allow for quicker emergency response by police, fire and medical services for road-related accidents and community emergencies in the Local Study Area. The road will also facilitate better coordination of regional resources and equipment for natural disasters such as wildfires and floods, while reducing reliance on air transport. Although Marten Falls First Nation does have local emergency responders, regional responders will be able to access the community more quickly to address issues.

Access to medical transportation by road will reduce reliance on air transport, which can be delayed due to weather conditions or higher-priority patients elsewhere in the region. Faster access to out-of-community hospitals could lower mortality rates and prevent complications from delayed care. Residents will have the option to drive themselves to medical centres, improving access to both urgent and routine healthcare. Women may have more flexibility in accessing prenatal care and may be able to stay in the community longer before relocating to give birth. Provincial policies, known as forced birth evacuations, may still require expectant mothers to leave weeks in advance (National Council of Indigenous Midwives, 2020). The road may improve comfort and reduce travel costs, though, it will not change the requirement for expecting mothers to leave their communities to give birth.

Violence and Harassment

The Community Access Road may influence violence crime dynamics the Local Study Area by increasing accessibility to and from the communities. While improved policing response times could help address violent incidents more effectively, increased road access to Marten Falls First Nation may also contribute to new safety concerns.

There is potential for road access to lead to an influx of drugs, alcohol, and other external influences that could contribute to higher crime rates, including assaults and property-related offenses. Increased mobility may also heighten risks of human trafficking, particularly for Indigenous women and gender-diverse individuals, who are already disproportionately affected by trafficking. This combined with the lack of cell service in the corridor surrounding the road, could pose additional risk for people travelling the road, especially women and girls. Through the Indigenous Knowledge Program, Aroland First Nation have noted that the Community Access Road will increase access to the area from outsiders, potentially jeopardizing the safety of their community members.

The increased movement of people and external influences may intensify existing social tensions, contributing to lateral violence, including bullying, exclusion, and intimidation. Greater exposure to outside perspectives and economic disparities could heighten divisions within the community, particularly if access to new opportunities is not equitably distributed. Increased interaction with non-community members may also lead to shifts in social dynamics, potentially reinforcing existing power imbalances or conflicts related to governance, employment, and resource access.

With year-round road access, emergency responders, peace officers and support workers can respond more quickly to violent crimes, domestic disputes, and other emergencies requiring additional personnel. Easier transportation for social services, crisis intervention teams, and mental health supports may provide more timely assistance to victims of violence and harassment. Increased connectivity may allow for greater collaboration between Marten Falls First Nation, law enforcement, and social agencies to implement community-led safety programs.

Indigenous communities with overlapping interests in the Local Study Area, including Constance Lake, Neskantaga, Animbiigoo Zaagi'igan Anishinaabek, Ginoogaming, and Long Lake #58 First Nations, face similar risks and potential negative effects related to crime, violence, and safety. This is also possible for regional municipal communities including Thunder Bay and Greenstone. Potential effects include increase in violence and criminal activity, particularly human trafficking.

9.5.6.4.10.2 Mitigation and Enhancement Measures

Drivers Licence

To address the barriers to obtaining a driver's licence in Marten Falls First Nation, the following mitigation measures should continue from construction into operations to support community goals of public safety:

- Owner / operator of the road to explore or continue to support opportunities to increase total Driver Licence holders, alongside the Ministry of Transportation, partnering with organizations such as:
- Kiikenomaga Kikenjigewen Employment and Training Services, or other trusted organizations, to offer driving training programs to support community members in passing their assessments;
- Third-party organizations that provide drivers licence testing for remote communities.

Road-related Injuries and Safety Standards

Mitigation measures for road-related injuries and safety standards include:

- The owner / operator will establish a working group with Marten Falls First Nation and Aroland First Nation to meet regularly to discuss community-proposed topics in relation to the road safety during operation of the Community Access Road, such as traffic challenges, emergency preparedness plans, and safe driving campaigns;
- The road owner will need to engage with law enforcement to implement increased monitoring; prepared for the opening of the road, allowing for an increased presence to monitor traffic, enforce speed limits, and deter impaired or reckless driving;
- The owner to consider alternative methods to using salt on roads to prevent attracting wildlife, minimizing the potential for vehicle-wildlife collisions; and
- The owner to consider the installation of road signage in both English and traditional languages indicated speed limits, sharp turns, wildlife crossings, and other hazards.

Enhancement measures for road-related injuries and safety standards includes:

- The project owner should consider launching public awareness campaigns to educate Marten Falls First Nation members on safe driving practices, the benefits of the new road, and responsible road use.

One mitigation measure heard from the community- installing a gate to block outsiders from accessing the area – would be difficult to implement for practical and safety challenges. If the road ownership is public, a private gate cannot be installed on a public road preventing access. A logistical concern is the need for personnel stationed at the gate 24-hours a day to allow community members to freely travel in and out of the community. Even if members were given a key to use the gate, there are safety implications if someone forgot their key and did not have enough gas to turn around to get to Aroland First Nation or to cell service. For these practical and safety-related reasons, this mitigation is not being proposed at this time.

Marten Falls First Nation continues to engage in discussions with the Province regarding the ownership and future operations of the Community Access Road. Access and ownership including gating security / ID system, will require further dialogue between the communities and the Province.

Violence and Harassment

Mitigation measures related to violence and harassment include:

- The owner / operator will establish a working group with Marten Falls First Nation and Aroland First Nation, and other interested Indigenous and municipal communities, to meet regularly to discuss community-proposed topics in relation to the operations of the Community Access Road, could include the consideration of developing community-based violence prevention programs, including safe shelters and crisis support for victims; strengthening mental health, addictions, harm reduction programs, and family support services to address root causes.

9.5.6.4.10.3 Predicted Residual Effects

Road Safety

Despite the implementation of mitigation measures, some **probable negative** residual effects on **local** road safety may persist at a **moderate** magnitude with **low** uncertainty. It is anticipated this residual effect will be **infrequent**, but **continuous** and **irreversible**. These negative residual effects on road safety due to increased number of road-related injuries and accidents may also be experienced outside the Loca Study Area, by regional municipal communities of Thunder Bay and Greenstone, even though the risk per vehicle may decrease due to overall improved all-reason road conditions.

Violence and Harassment

Even with the mitigation measure, there is still the potential for a **possible negative** residual effect associated with an increase in human trafficking and criminal activity and family and social conflicts, which may continue as economic and social shifts occur **locally**. This residual effect is anticipated to be of **moderate** magnitude with **low** uncertainty while being **infrequent** and **continuous** but **reversible.**

Indigenous communities with overlapping interests in the Local Study Area, including Constance Lake, Neskantaga, Animbiigoo Zaagi'igan Anishinaabek, Ginoogaming, and Long Lake #58 First Nations, face similar risks and potential negative residual effects related to crime, violence, and safety. These residual effects are also possible for regional municipal communities including Thunder Bay and Greenstone. Potential residual effects include increase in violence and criminal activity, particularly human trafficking.

9.5.6.4.11 Biophysical Determinants to Human Health Effects

9.5.6.4.11.1 Potential Effects

The biophysical factors potential influencing human health during operations are similar to those during construction. In some instances, reduced activity during operations may lessen the potential effects, while in other cases, certain activities may increase, amplifying the potential effects. A summary of contaminant release during construction and their potential to affect the environment influencing human health has been included for each biophysical indicator.

For the purpose of this assessment, changes to the quality of the environment where country foods are harvested, as described above, will be used to evaluate the potential residual effects associated with project-related activities that may affect the quality of these foods. Biophysical determinants to human health may be affected by chemical exposures through the consumption of contaminated country foods, depending on the type, magnitude, and frequency of exposure. Further information on potential effects is included in the Problem Formulation for Human Health Risk Assessment in Appendix T.

Air Quality

A summary of contaminant releases during operations and their potential to affect the environment influencing human health include:

- Emissions of volatile substances (in other words, burning of fossil fuels in vehicles and equipment)
- Elevated concentrations of particulate matter resulting from fugitive road dust.

Noise and Vibration

As the magnitude of the residual effects from the increased noise due to road operations is low, and the residual effects from the increased noise due to quarry use are not predicted to be frequent, the noise and vibrations technical support team determined residual effects during operations are assessed as not significant.

Because the residual effects from the increased vibration during construction and operations are not predicted to be long-term in duration or frequent, the noise and vibrations technical support team determined residual effects during are assessed as not significant.

Soil Quality

A summary of contaminant releases during operations and their potential to affect the biophysical environment for soil quality influencing human health include:

- Potential effects on human health may occur through incidental ingestion of soils on country foods, inhalation of dust, or dermal absorption (through the skin). Operations activities that may affect soil quality include:
  - Leaks and spills during equipment, supplies and personnel mobilization; and
  - Deposition of dust from blasting and mobilization activities.

Soil quality may be adversely affected by hazardous material leaks, spills, or deposition of air emissions and dust during operation. Existing soil analysis shows some concentrations exceeding applicable standards, and any residual effects could compound these exceedances. Predicted soil concentrations have not been modeled. Effects on soil quality during operations are predicted to be short-term and limited to the Construction Disturbance Area.

Sediment Quality

A summary of contaminant releases during operations and their potential to affect the biophysical environment for sediment quality influencing human health include:

- Potential effects on human health may be affected by chemical exposures through the consumption of contaminated water or through dermal absorption (through the skin) during recreational activities, bathing, or other direct contact. Both surface water and groundwater have the potential to be used as potable water sources and could be used for cooking and bathing. Operations activities which may affect sediment quality include:
  - Maintaining the Community Access Road, permanent access roads, bridges and culverts; and
  - Operate the Community Access Road and permanent access roads

Land Use

A summary of contaminant releases during operations and their potential to affect the biophysical environment for land use influencing human health include:

- Human health may be affected from chemical exposures through the inhalation of contaminated air, consumption of contaminated water or through dermal absorption (through the skin) during recreational activities, bathing, or other direct contact with contaminated water, soils or sediment. Volatile substances in water

may be inhaled during activities such as bathing and cooking. Construction activities that may affect Human health include:

- Maintaining the Community Access Road, permanent access roads, bridges and culverts; and
- Operate the Community Access Road and permanent access roads.

Peatlands

A summary of contaminant releases during construction and their potential to affect the environment for peatlands influencing human health include:

- Within the Local Study Area, peatlands are existing sources of carbon dioxide and methane. Construction activities will remove portions of the wetland, reducing the amount of carbon dioxide and methane released by natural processes, having a positive effect over the long-term. Peatlands Technical Support Document [Appendix I].

Accidents and Malfunctions

A summary of contaminant releases during operations and their potential to affect the biophysical environment for accidents and malfunctions influencing human health include:

- Accidents and malfunctions can affect the quality of soils, sediment, surface water and groundwater, and therefore Country Foods. Potential effects on human health may be through chemical exposures through the consumption of contaminated water or through dermal absorption (through the skin) during recreational activities, bathing, or other direct contact. Operations activities which may affect soil, sediment, surface water and groundwater quality include:
  - Maintaining the Community Access Road, permanent access roads, bridges and culverts;
  - Operations of the Community Access Road is expected to result in increased dust generation in comparison to construction.

9.5.6.4.11.2 Mitigation and Enhancement Measures

In general, mitigations during operations include:

- Obtaining all required permits, authorizations, and approvals prior to conducting specific maintenance activities;
- Complying with all applicable regulations, legislation, permit requirements, and best practices regarding all work;

- Development and compliance with Project specific Management and monitoring plans. Examples include a Construction Best Management Practice Plan, Blasting and Communication Management Plan, Erosion and Sediment Control Plan, Fugitive Dust Management Plan;
- Timing maintenance activities to minimize environmental effects;
- Owner / operator to develop a community-based reporting system that enables community members and employees to report concerns, including those related to the biophysical environment;
- During detail design, complete an existing conditions assessment including laboratory analysis of the quality of the water from the Albany River being used as drinking water. During construction, a regular monitoring / sampling program will be conducted until the boil-water advisory is lifted;
- During detail design, conduct an existing conditions assessment including laboratory analysis of traditional foods; and
- The owner / operator to establish working groups with Marten Falls First Nation, Aroland First Nation, and other interested Indigenous communities from the Regional Study Area—including Constance Lake First Nation, Fort Albany First Nation, Attawapiskat First Nation, Kashechewan First Nation, Kasabonika Lake First Nation, Kitchenuhmaykoosib Inninuwug First Nation, Kingfisher Lake First Nation, Eabametoong First Nation, Mishkeegogamang First Nation, Neskantaga First Nation, Nibinamik First Nation, Wapekeka First Nation, Wawakapewin First Nation, Webequie First Nation, Weenusk First Nation, Wunnumin Lake First Nation, Animbiigoo Zaagi'igan Anishinaabek, Ginoogaming First Nation, and Long Lake #58 First Nation—to meet regularly to discuss community-proposed topics in relation to the operations of the Community Access Road, including concerns related to the biophysical effects on human health during construction, such as air, noise and vibration, sediment, soil, ground and surface water, and land-use.

9.5.6.4.11.3 Predicted Residual Effects

Determining the magnitude and extent of residual effects of project construction activities on biophysical human health requires the modelling of predicted concentrations based on expected Project activities. For this project, air concentrations during operations were the only aspect modelled as part of the technical study. High magnitude effects were predicted for the air quality contaminants in **Table 9.5-32**.

Table 9.5-32: Air Quality Contaminant Modelling

Parameter	Duration	Location	Extent (Community Access Road)
Particulate Matter Less than 2.5 Micrometres	24-hour	North-south road segment	115 metres from road
Particulate Matter Less than 2.5 Micrometres	Annual	North-south road segment	134 metres from road
Particulate Matter Less than 10 Micrometres	24-hour	North-south road segment	1,986 metres from road
Particulate Matter Less than 10 Micrometres	24-hour	Community road segment	50 metres from road
Total Suspended Particulate	24-hour	North-south road segment	3,004 metres from road
Total Suspended Particulate	24-hour	Community Access Road segment	119 metres from road
Total Suspended Particulate	Annual	North-south road segment	899 metres from road
Dust deposition	30-day	North-south road segment	45 metres from road
Dust Deposition	annual	North-south road segment	681 metres from road
Dust Deposition	annual	Community Access Road segment	28 metres from road

Source: Atmospheric Environment Technical Support Document - Volume 1: Air Quality (**Appendix S**).

Residual effects to surface water, groundwater, soils, and sediment, including deposition of dust onto surface water soils and sediment, were not evaluated in the individual technical studies.

9.5.6.4.11.4 Predicted Indirect Effects

Indirect effects on biophysical human health are anticipated to result from changes in land use. These changes may influence the quantity and variety of traditional foods consumed, the locations of exposure to soils, sediment, surface water and air, and the durations of exposures. These factors could contribute to an increased potential for unacceptable risks to human health.

9.5.6.5 Summary of Residual Effects

Table 9.5-33 provides a summary of the potential effects for community well-being, mitigation measures, and residual effects. Detailed information is included in **Appendix T**.

Table 9.5-33: Summary of Residual Effects for Community Well-being Discipline and Characterization

Valued Component	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Sustainable Population Growth**	• Construction	• Negative effect to community cohesion due to rapid changes in the on-reserve population in age and gender distribution as well as overall community population	• The owner / operator to establish working groups with Marten Falls First Nation and Aroland First Nation to discuss community concerns and proposed topics, including those in relation to changes in population or social demographics. • Owner / operator to implement Diversity, Equity, and Inclusion hiring policies to prioritize women and reduce gender disparities. • Owner / operator to house workers in autonomous camps to limit demographic shifts and disruptions in community.	• No residual effect anticipated.	• No residual effect anticipated.
• **Sustainable Population Growth**	• Operations	• Positive effect of shift towards a balanced age distribution due to reduced out-migration among younger families, improved Elder retention; easier travel for employment, education, and services.	• Owner / operator to house workers in autonomous camps to limit demographic shifts and disruptions.	• No residual effect anticipated.	• No residual effect anticipated.
• **Sustainable Population Growth**	• Operations	• Positive effect of increasing community population due to attraction of off-reserve members and external workers.	• No mitigation measures proposed.	• No residual effect anticipated.	• No residual effect anticipated.
• **Labour Market Dynamics**	• Construction	• Negative effect of a short-fall in local labour availability compared to demand for employment.	• The owner / operator to establish working groups with Marten Falls First Nation and Aroland First Nation to discuss construction-related issues and unemployment by identifying and removing employment barriers, offering job readiness programs, and providing counseling and addiction support services to support community members. • Owner / operator to implement Community Readiness Strategies and Adaptive Management Plans to assess and respond to community needs. • Owner / operator to provide information on available opportunities to help community members obtain necessary qualifications. • Owner / operator to create a Local Training Plan to complete a local skills assessment and utilize local labour force. • Owner / operator to offer ongoing job readiness programs and coordinate training timing to support workforce transition and career growth. • Owner / operator to implement Diversity, Equity, and Inclusion hiring policy, enhanced through training programs, job fairs, and outreach, to actively prioritize women in construction-related employment opportunities and reduce gender disparities in the work force. • Owner / operator to gradually integrate new workers into the workforce through shorter days and shift rotations. • All construction workers to be housed in autonomous work camps to limit disruptions to communities.	• No residual effect anticipated.	• No residual effect anticipated.
• **Labour Market Dynamics**	• Construction	• Positive effect of the creation of direct, indirect, and induced jobs • Positive effect of increased labour income and Gross Domestic Product contributions.	• No mitigation measures proposed.	• No adverse residual effect anticipated.	• No residual effect anticipated.

Valued Component	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Labour Market Dynamics**	• Operations	• Positive effect of the creation of direct, indirect, and induced jobs • Positive effect of increased labour income and Gross Domestic Product contributions.	• No mitigation measures proposed.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Labour Market Dynamics**	• Operations	• Positive effect on educational attainment.	• No mitigation measures proposed.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Economy**	• Construction	• Positive new business opportunities for Indigenous businesses related to construction contracts and services.	• No mitigation measures proposed.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Economy**	• Construction	• Negative disruptions to local businesses during construction.	• Owner / operator to implement Community Readiness Strategies and Adaptive Management Plans to assess and respond to community needs. • Owner / operator to create a Local Content Plan to utilize a certain dollar value or share towards local businesses and owner / operators. • Owner / operator to consult with local businesses that would be potentially affected by work zone effects and determine the optimal times and conditions for the construction to take place, such as during off-peak times.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Economy**	• Operations	• Negative effect of ongoing opportunities for Indigenous businesses in road operation and maintenance and transportation services.	• No mitigation measures proposed.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Economy**	• Construction	• Positive effect of significant tax revenue generation.	• No mitigation measures proposed.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Economy**	• Operations	• Positive effect of total tax revenue effect of $2.7 million in Ontario and $3.0 million in Canada.	• No mitigation measures proposed.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Economy**	• Construction	• Positive impact effect on Gross Domestic Product, labour income, gross operating surplus, and tax revenues.	• No mitigation measures proposed.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Economy**	• Operations	• Total economic activity of $22.4 million in Ontario and $24.8 million in Canada. • Positive effect on Gross Domestic Product, labour income, and gross operating surplus, and tax revenues.	• No mitigation measures proposed.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Economy**	• Construction • Operations	• Positive effect on the productivity of individuals and businesses in the region.	• No mitigation measures proposed.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Economy**	• Construction • Operations	• Positive effect on the value of land that is surrounding the transportation infrastructure.	• No mitigation measures proposed.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Economy**	• Construction • Operations	• Positive effect on diversifying the economy.	• No mitigation measures proposed.	• No adverse residual effect anticipated.	• No residual effect anticipated.

Valued Component	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Community Access to Infrastructure and Services**	• Construction	• Negative effect due to increased transportation to and from the community.	• Owner / operator will develop an Equipment Mobilization Plan with both Marten Falls First Nation and Aroland First Nation for the movement of equipment, personnel, supplies, and resources. Where possible, construction traffic should be separated from community traffic to improve safety and minimize disruptions. The mobilization plan should also include a clear communications strategy to keep the community informed of the mobilization schedule, making residents aware of periods of increased heavy equipment traffic on the winter road. • Owner / operator, when possible, will transport employees on a charter flight.	• Residual changes to Community Access to Infrastructure and Services due to increased transportation to and from the community.	• Context: Possible increase in access to community via winter road / air • Direction: Negative • Magnitude: Moderate • Geographic Extent: Local • Duration: Short-term • Frequency: Infrequent • Reversibility: Reversible • Likelihood: Possible • Uncertainty: Low • Significance: Not Significant • Confidence: High
• **Community Access to Infrastructure and Services**	• Construction	• Negative effects due to increased pressure on local infrastructure and essential services.	• Owner / operator will establish working groups with Marten Falls First Nation and Aroland First Nation to meet regularly to discuss community-proposed topics in relation to the construction of the Community Access Road, including topics avoiding pressure on local, essential services and infrastructure. • All construction workers (including on- and off-reserve members) will be housed in autonomous work camps equipped with independent water, wastewater, and power systems. These systems need to be properly maintained to reduce reliance on community infrastructure and to prevent contamination risks. • Owner / operator will develop waste management policies to minimize waste production and support responsible disposal. Collaboration with the community will be prioritized to develop effective construction waste management and disposal strategies, incorporating local input. • Owner / operator will establish a secure fuel storage facility and maintain a reliable fuel supply throughout the construction season. Fuel deliveries will be planned in advance and transported via the winter road, reducing reliance on costly air transport and preserving community fuel resources. All fuel storage sites will comply with safety and environmental regulations to prevent spills and contamination.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Community Access to Infrastructure and Services**	• Operations	• Positive effects due to increased year-round access to and from the community.	• No mitigation measures proposed.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Community Access to Infrastructure and Services**	• Operations	• Indirect positive effect due to increased access to goods and services (including reduced costs).	• No mitigation measures proposed.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Community Access to Infrastructure and Services**	• Operations	• Positive effects due to increased delivery of essential services in community.	• No mitigation measures proposed.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Community Access to Infrastructure and Services**	• Operations	• Indirect positive effect due to reduced costs and logistical challenges to building and maintaining essential infrastructure.	• No mitigation measures proposed.	• No adverse residual effect anticipated.	• No residual effect anticipated.

Valued Component	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Housing**	• Construction	• Negative effect due to increased demand for housing, potential overcrowding.	• Owner / operator to establish working groups with Marten Falls First Nation and Aroland First Nation to meet regularly to discuss community-proposed topics in relation to the construction of the Community Access Road, including topics associated with housing adequacy and converting construction camps to permanent housing. • House workers in autonomous camps to limit demographic shifts and reduce pressure on community housing.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Housing**	• Operations	• Negative effect on housing suitability due to increased demand for housing, potential overcrowding.	• Owner / operator to establish working groups with Marten Falls First Nation and Aroland First Nation to meet regularly to discuss community-proposed topics in relation to the Community Access Road, including topics associated with housing, such as monitoring of housing demand and adjustments to meet changes in housing needs.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Housing**	• Operations	• Positive effect on housing adequacy due to reduced transportation costs and logistical challenges to building new homes.	• No mitigation measures proposed.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Housing**	• Operations	• Indirect positive effect on health due to improved housing adequacy for example reduced mold / overcrowding.	• No mitigation measures proposed.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Housing**	• Operations	• Positive effect of improved accessibility of building materials.	• No mitigation measures proposed.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Cultural Preservation and Change**	• Construction	• Negative effect due to disruption to traditional economy and cultural practices.	• Owner / operator to establish working groups with Marten Falls First Nation, Aroland First Nation, and other interested Indigenous communities from the Regional Study Area, to meet regularly to discuss community-proposed topics in relation to the construction of the Community Access Road, including where to appropriately locate safety pull out areas to promote access, and other traditional harvesting issues. • Prior to construction, owner / operator will develop Access Management Plans with Marten Falls First Nation and Aroland First Nation in relation to hunting, trapping and gathering activities. All activities must conform to licensing requirements and adhere to the rules and regulations under the Ministry of Natural Resources. • Provide flexible work schedules during key hunting, trapping, and gathering seasons to support continued access to traditional food sources. • Owner / operator to sponsor community-led harvesting initiatives.	• Residual changes to Cultural Preservation and Change due to disruption to traditional economy and cultural practices	• Context: Possible shift from traditional economy activities • Direction: Negative • Magnitude: Low • Geographic Extent: Construction Disturbance Area • Duration: Medium-term • Frequency: Frequent • Reversibility: Irreversible • Likelihood: Possible • Uncertainty: High • Significance: Not Significant • Confidence: Moderate
• **Cultural Preservation and Change**	• Construction	• Negative effect due to traditional language decline.	• Owner / operator to provide Training and Work Materials in Indigenous Languages. Offer onboarding materials, safety protocols, and job-related paperwork in Indigenous languages alongside English to provide language accessibility for all workers. • Owner / operator to implement multi-lingual worksite signage. Reduce language barriers at the worksite by using multi-lingual signage at work sites, including directional signs, safety notices, workplace policies, and equipment labels, to promote the use of Indigenous languages in the workplace. • Owner / operator to provide Cultural Sensitivity and Language Awareness Training. Educate non-Indigenous supervisors and workers on the importance of Indigenous languages in cultural identity, knowledge transmission, and community well-being. Encourage an inclusive workplace where traditional language use is supported and valued.	• No adverse residual effect anticipated.	• No residual effect anticipated.

Valued Component	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
			• Owner / operator to implement a Zero-Tolerance Policy for Language Discrimination. Establish clear workplace policies so that Indigenous workers are not discouraged from speaking their traditional language. Supervisors and project managers should actively reinforce language inclusivity and address any instances of discrimination or bias. • Owner / operator to introduce a cultural safety mechanism. Introduce a workplace mechanism, such as a cultural safety flag, allowing employees to pause work or request support if they feel uncomfortable due to language-related issues. Propose a Cultural Safety and Stop Work Protocol.		
• **Cultural Preservation and Change**	• Operations	• Positive effects on traditional economy; enhanced participation in cultural activities; increase in traditional language due to increased access and connection for community members.	• No mitigation measures proposed	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Community and Public Health**	• Construction	• Positive effect of improved mental well-being through employment in construction, increased financial stability, and greater self-sufficiency, which can reduce financial stress, and improve sense of pride and confidence.	• No mitigation measures proposed	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Community and Public Health**	• Construction	• Negative effect on mental health and well-being due to long hours, tight deadlines, and physically demanding tasks, leading to stress and fatigue; potential for social disconnection and emotional strain from extended periods away from families; employment disparities; and sensory disturbances and restricted land access.	• Owner / operator to collaborate with Marten Falls First Nation and Aroland First Nation to provide mental health counseling, mentorship, and peer support at work camps, with onsite Elders or cultural liaisons to promote emotional and cultural well-being, support skill development and workplace adjustment. • Owner / operator to implement a gradual work force integration for community members, introducing shorter workdays and shift rotations (for example, starting with 2-3 days on with a day or two break instead of 10 consecutive days) to ease new workers into construction roles. • Owner / operator to provide cultural safety training for all workers, including supervisors and non-Indigenous employees, to complete training on Indigenous culture, traditions, and historical experiences, to promote a safe and inclusive work environment. • Owner / operator to hold training session on violence and harassment prevention. • Owner / operator to enforce a zero-tolerance policy for workplace discrimination so that Indigenous workers feel respected and included.	• Residual changes to Community and Public Health due to long hours, tight deadlines, and physically demanding tasks, leading to stress and fatigue; potential for social disconnection and emotional strain from extended periods away from families; employment disparities; and sensory disturbances and restricted land access.	• Context: Possible negative mental health effects. • Direction: Negative • Magnitude: Moderate • Geographic Extent: Local • Duration: Short-term • Frequency: Infrequent • Reversibility: Reversible • Likelihood: Possible • Uncertainty: High • Significance: Not Significant • Confidence: Low
• **Community and Public Health**	• Construction	• Negative effects from increased risk of substance use.	• Owner / operator will establish a working group with Marten Falls First Nation and Aroland First Nation to meet regularly to discuss community-proposed topics in relation to the construction of the Community Access Road, which could include topics in relation offering mental health supports, counselling and addiction support services. • All construction workers (including on- and off-reserve members) will be housed in autonomous work camps to limit demographic shifts and limit disruptions to social structures and community dynamics. • Owner / operator to develop and implement monitoring and enforcement, including regular security checks at work camps and entry points (for example, airport) for alcohol and substances to prevent entry into the community.	• No adverse residual effect anticipated.	• No residual effect anticipated.

Valued Component	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
			• Owner / operator to collaborate with the community (Marten Falls First Nation and Aroland First Nation) to provide mental health counseling, addictions counseling, mentorship, and peer support at work camps, with onsite Elders or cultural liaisons to promote emotional and cultural well-being. • Owner / operator to enforce a zero-tolerance policy for alcohol and substance use at work camps. • Owner / operator to implement a gradual work force integration for community members, introducing shorter workdays and shift rotations (for example, starting with 2-3 days on with a day or two break instead of 10 consecutive days) to ease new workers into construction roles. • v to provide cultural safety training for all workers, including supervisors and non-Indigenous employees, to complete training on Indigenous culture, traditions, and historical experiences, to promote a safe and inclusive work environment. • Owner / operator to hold training session on violence and harassment prevention. • Owner / operator to enforce a zero-tolerance policy for workplace discrimination so that Indigenous workers feel respected and included. • Owner / operator to provide cultural and recreational activities (for example, cards, board games, sports), when possible, to promote well-being and reduce boredom or stress-related substance use.		
• **Community and Public Health**	• Operations	• Positive effect on health due to improved access to health services	• No mitigation measures proposed.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Community and Public Health**	• Operations	• Positive effect on recreation due to improved access with other communities and recreational / event areas.	• No mitigation measures proposed.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Community and Public Health**	• Operations	• Positive effect on mental health and well-being due to improved access to mental health services and reduced isolation.	• No mitigation measures proposed.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Community and Public Health**	• Operations	• Negative effect on mental health and well-being due to loss of connectivity to the land, change in sense of place and identity due to presence of the road.	• Owner / operator and owner to form a Working Group with Marten Falls First Nation, Aroland First Nation and the owner / operator to co-develop a Safety and Wellness Plan that addresses project-related mental health and well-being concerns.	• Residual changes to Community and Public Health due to loss of connectivity to the land, change in sense of place and identity due to presence of the road.	• Context: Decrease in mental well-being • Direction: Negative • Magnitude: Medium • Geographic Extent: Local • Duration: Long-term • Frequency: Continuous • Reversibility: Reversible • Likelihood: Possible • Uncertainty: High • Significance: Significant • Confidence: Low

Valued Component	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Community and Public Health**	• Operations	• Negative effect due to potential increase in substance use due to easier access to drugs and alcohol.	• Owner / operator to form a Working Group with Marten Falls First Nation, Aroland First Nation and the owner / operator to co-develop a Safety and Wellness Plan that addresses project-related substance use concerns.	• Residual changes to Community and Public Health due to potential increase in substance use due to easier access to drugs and alcohol.	• Context: Increase in substance abuse. • Direction: Negative • Magnitude: Medium • Geographic Extent: Local • Duration: Long-term • Frequency: Continuous • Reversibility: Reversible • Likelihood: Possible • Uncertainty: High • Significance: Significant • Confidence: Low
• **Community and Public Health**	• Operations	• Positive effect due to improved access to addictions treatment options.	• No mitigation measures proposed.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Access to Clean Water**	• Construction	• Negative effect due to increased demand for drinking water.	• Construction workers will be housed in autonomous work camps, reducing pressure on community water resources. • Owner / operator to implement temporary water storage tanks or other measures to accommodate peak water demands during construction.	• No adverse residual effect anticipated.	• No adverse residual effect anticipated. • Significance: Not Significant • Confidence: High
• **Access to Clean Water**	• Construction	• Negative effect on quality of surface and / ground water as a result of construction, accidents, and spills.	• Owner / operator to establish working groups with Marten Falls First Nation, Aroland First Nation, and other interested Indigenous communities from the Regional Study Area—including Constance Lake First Nation, Fort Albany First Nation, Attawapiskat First Nation, Kashechewan First Nation, Kasabonika Lake First Nation, Kitchenuhmaykoosib Inninuwug First Nation, Kingfisher Lake First Nation, Eabametoong First Nation, Mishkeegogamang First Nation, Neskantaga First Nation, Nibinamik First Nation, Wapekeka First Nation, Wawakapewin First Nation, Webequie First Nation, Weenusk First Nation, Wunnumin Lake First Nation, Animbiigoo Zaagi'igan Anishinaabek, Ginoogaming First Nation, and Long Lake #58 First Nation—to meet regularly to discuss community-proposed topics in relation to the construction of the Community Access Road, including concerns related to contamination of ground and surface water. • Surface water and groundwater is not to be used as potable water. Water treatment will mitigate any potential negative effects.	• Residual changes to access to clean water as a result of construction, accidents, and spills.	• Context: Possible negative effect on quality of drinking water • Direction: Negative • Magnitude: Moderate • Geographic Extent: Local study area • Duration: Short-term • Frequency: Infrequent • Reversibility: Reversible • Likelihood: Possible • Uncertainty: High • Significance: Not Significant • Confidence: Moderate
• **Access to Clean Water**	• Operations	• Positive effects on access due to lower transportation costs for shipping drinking water; improved supply chain reliability, and enhanced maintenance of the water treatment plant.	• No mitigation measures proposed	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Access to Clean Water**	• Operations	• Negative effect on quality of drinking water as a result of road operations, accidents, and spills.	• Owner / operator to establish working groups with Marten Falls First Nation, Aroland First Nation, and other interested Indigenous communities from the Regional Study Area, to meet regularly to discuss community-proposed topics in relation to the construction of the Community Access Road, including concerns related to contamination of ground and surface water. • Surface water and groundwater is not to be used as potable water. Water treatment will mitigate any potential negative effects.	• Residual changes to Access to Clean Water as a result of road operations, accidents, spills.	• Context: Possible negative effect on quality of drinking water • Direction: Negative • Magnitude: Moderate • Geographic Extent: Local study area • Duration: Long-term • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Possible • Uncertainty: High • Significance: Not Significant • Confidence: Moderate

Valued Component	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Traditional Foods**	• Construction	• Positive effect on access to traditional foods as increased income from construction jobs will allow community members to buy supplies for hunting and trapping.	• No mitigation measures proposed.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Traditional Foods**	• Construction	• Negative effect of reduction in availability of traditional foods due to construction disturbances to traditional food sources.	• Owner / operator to establish working groups with Marten Falls First Nation, Aroland First Nation, and other interested Indigenous communities from the Regional Study Area, to meet regularly to discuss community-proposed topics in relation to the construction of the Community Access Road, including identifying key harvesting areas to implement measures that can minimize construction disturbances to traditional food resources during harvesting seasons and adjusting construction activities to avoid peak harvesting periods. • Owner / operator should provide flexibility in work schedules during key hunting, trapping, and gathering seasons to support continued access to traditional food sources.	• Residual changes to Traditional Foods due to construction disturbances to traditional food sources.	• Context: Possible disturbance to traditional food sources from construction-related activities • Direction: Negative • Magnitude: Low • Geographic Extent: Local • Duration: Short-term • Frequency: Infrequent • Reversibility: Reversible • Likelihood: Possible • Uncertainty: High • Significance: Not Significant • Confidence: Low
• **Traditional Foods**	• Construction	• Negative effect on the quality of traditional foods due to contamination.	• Owner / operator to establish working groups with Marten Falls First Nation, Aroland First Nation, and other interested Indigenous communities from the Regional Study Area, to meet regularly to discuss community-proposed topics in relation to the construction of the Community Access Road, including identifying key harvesting areas to implement measures that can minimize construction disturbances to traditional food resources during harvesting seasons and adjusting construction activities to avoid peak harvesting periods.	• Residual changes to Traditional Foods due to contamination.	• Context: Possible disturbance to traditional food sources from construction-related activities • Direction: Negative • Magnitude: Moderate • Geographic Extent: Local • Duration: Short-term • Frequency: Infrequent • Reversibility: Reversible • Likelihood: Possible • Uncertainty: High • Significance: Not Significant • Confidence: Low
• **Traditional Foods**	• Operations	• Positive effect of increased access to traditional harvesting sites	• No mitigation measures proposed	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Traditional Foods**	• Operations	• Negative effect of reduction in availability of traditional foods due to overharvesting and environmental strain from the road	• Owner / operator to establish working groups with Marten Falls First Nation, Aroland First Nation, and other interested Indigenous communities from the Regional Study Area, to meet regularly to discuss community-proposed topics in relation to the construction of the Community Access Road, including discussions about pathways to contamination through traditional foods and opportunities to prevent contamination for example signage related to washing dust off gathered foods. • Owner to work with Ontario's Ministry of Natural Resources to encourage more frequent patrols of Conservation Officers along the Community Access Road to confirm hunters and fishermen are not exceeding their limits and that they have the proper tags and licenses. • Owner / operator to work with communities and governments, as required, to support education and development of Indigenous Conservation Officer (Game Warden) program. • Owner / operator to sponsor community-led harvesting initiatives in Marten Falls First Nation and Aroland First Nation.	• Residual changes to Traditional foods due to overharvesting and environmental strain from the road.	• Context: Possible disturbance to traditional food sources from the road or overharvesting • Direction: Negative • Magnitude: Moderate • Geographic Extent: Local • Duration: Long-term • Frequency: Infrequent • Reversibility: Reversible • Likelihood: Possible • Uncertainty: High • Significance: Not Significant • Confidence: Low

Valued Component	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Traditional Foods**	• Operations	• Positive effect of reduced cost of groceries and improved access to fresher, higher-quality foods.	• No mitigation measures proposed	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Traditional Foods**	• Operations	• Negative effect on the quality of traditional foods due to contamination.	• Owner / operator to establish working groups with Marten Falls First Nation, Aroland First Nation, and other interested Indigenous communities from the Regional Study Area, to meet regularly to discuss community-proposed topics in relation to the construction of the Community Access Road, including discussions about pathways to contamination through traditional foods and opportunities to prevent contamination for example signage related to washing dust off gathered foods.	• Residual changes to Traditional Foods due to contamination.	• Context: Possible disturbance to quality of traditional food sources • Direction: Negative • Magnitude: Moderate • Geographic Extent: Local • Duration: Long-term • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Possible • Uncertainty: High • Significance: Significant • Confidence: Low
• **Public Safety**	• Construction	• Negative effect that demand for workers with Driver's licences exceeds those available.	• Explore opportunities to increase total Driver Licence holders, alongside the Ministry of Transportation, including partnerships with third-party remote licence providers.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Public Safety**	• Construction	• Negative effect of increased traffic and road-related injuries	• Develop Equipment Mobilization Plans with local First Nations for the movement of equipment, personnel, and supplies. • Implement driver safety training tailored to winter road conditions and remote community travel.	• Residual change to Public Safety due to increased traffic and road-related injuries.	• Context: Increase in construction-related traffic • Direction: Negative • Magnitude: Moderate • Geographic Extent: Local • Duration: Short-term • Frequency: Infrequent • Reversibility: Reversible • Likelihood: Probable • Uncertainty: Low • Significance: Not Significant • Confidence: High
• **Public Safety**	• Construction	• Negative effect of increased strain on emergency services.	• Develop, with the Ministry of Health, onsite safety and emergency preparedness programs to include fire suppression systems, medical care, security personnel, monitor safety compliance, emergency response and clear communication protocols between construction teams and emergency responders. • Comply with all relevant health and safety requirements, including but not limited to, preparation of a Health and Safety Policy.	• Residual changes to Public Safety due to increased strain on emergency services.	• Context: Increased strain on emergency services • Direction: Negative • Magnitude: Low • Geographic Extent: Local • Duration: Short-term • Frequency: Infrequent • Reversibility: Reversible • Likelihood: Possible • Uncertainty: Low • Significance: Not Significant • Confidence: High

Valued Component	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Public Safety**	• Construction	• Negative effect of increased risk of violence and harassment.	• Owner / operator to establish working groups with Marten Falls First Nation, Aroland First Nation to meet regularly to discuss community-proposed topics in relation to the construction of the Community Access Road, including: • financial literacy programs for workers and families to help manage income fluctuations and reduce financial stress, addressing economic disparities that could contribute to resentment and lateral violence. • measures to strengthen cultural programming and land-based activities to reinforce community cohesion and well-being. Strengthening cultural identity and offering community-driven programs can provide positive coping mechanisms for workers and families experiencing stress due to shift work and can offer a protective factor against violence and social disruption by strengthening support networks and reducing isolation. • supports for unemployed community members by identifying employment barriers and offering job readiness programs to support community members facing unemployment. • House workers in autonomous work camps to limit unsupervised interactions with the community and prioritize gender-divided living quarters in the work camps. • Enforce zero-tolerance policies for harassment and violence. • Provide cultural safety and language awareness training for all workers, including supervisors and non-Indigenous employees, to complete training on Indigenous culture, traditions, and historical experiences to understand Indigenous cultural norms and appropriate community interactions to reduce instances of harassment or violence. • Comply with the Human Rights Code (Ontario, 2024b) to prevent workplace discrimination and uphold employee rights to reduce work force tensions. • Mental health counseling, mentorship, and peer support at work camps to reduce stress-related aggression. On-site Elders or cultural liaisons will offer emotional support and traditional guidance to workers. • Implement a gradual work force integration for community members, starting with shorter workdays and shift rotations. • Implement Diversity, Equity, and Inclusion hiring policy.	• Residual changes to Public Safety due to increased risk of violence and harassment.	• Context: Occasional workplace conflicts, ongoing family stress from shift work, and potential lateral violence from economic disparities • Direction: Negative • Magnitude: Moderate • Geographic Extent: Local • Duration: Short-term • Frequency: Infrequent • Reversibility: Reversible • Likelihood: Possible • Uncertainty: Low • Significance: Not Significant • Confidence: Moderate
• **Public Safety**	• Operations	• Positive effect of increased demand for employment opportunities requiring a driver's license.	• No mitigation measures proposed.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Public Safety**	• Operations	• Negative effect of increased in road-related injuries due to increase in road traffic.	• Owner / operator will establish a working group with Marten Falls First Nation and Aroland First Nation to meet regularly to discuss community-proposed topics in relation to the operations of the Community Access Road, including advocating for funding to build a local fire station, recruit paramedics, and expand medical transport services; develop emergency preparedness plans, first responder training programs, and informing in independent medical providers (for example, dentists and physiotherapists) for potential for increased demand. • The owner to engage with law enforcement to implement increased monitoring; prepared for the opening of the road, allowing for an increased presence to monitor traffic, enforce speed limits, and deter impaired or reckless driving. • The owner to consider alternative methods to using salt on roads to prevent attracting wildlife, minimizing the potential for vehicle-wildlife collisions. • The owner to consider the installation of road signage in both English and traditional languages indicated speed limits, sharp turns, wildlife crossings, and other hazards.	• Residual changes to Public Safety due to increase in road traffic.	• Context: Increased traffic may lead to increased number of accidents Direction: Negative • Magnitude: Moderate • Geographic Extent: Local • Duration: Continuous • Frequency: Infrequent • Reversibility: Irreversible • Likelihood: Probable • Uncertainty: Low • Significance: Not Significant • Confidence: High

Valued Component	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Public Safety**	• Operations	• Positive effect of improved access to emergency services.	• No mitigation or enhancement measures proposed.	• No adverse residual effect anticipated.	• No residual effect anticipated.
• **Public Safety**	• Operations	• Negative effect of increase in violence and harassment.	• Owner / operator to establish working groups with Marten Falls First Nation, Aroland First Nation, and other interested Indigenous communities from the Regional Study Area, to meet regularly to discuss community-proposed topics in relation to the construction of the Community Access Road, including, could include the consideration of developing community-based violence prevention programs, including safe shelters and crisis support for victims; strengthening mental health, addictions, harm reduction programs, and family support services to address root causes.	• Residual changes to Public Safety due to increase in violence and harassment.	• Context: Potential for increase in violence, harassment, criminal activity, and / or human trafficking. • Direction: Negative • Magnitude: Moderate • Geographic Extent: Local • Duration: Continuous • Frequency: Infrequent • Reversibility: Reversible • Likelihood: Possible • Uncertainty: Low • Significance: Significant • Confidence: Moderate
• **Biophysical Determinants of Human Health - Air** Note* Additional information regarding effects as they relate to human health can be found in the Problem Formulation in Appendix T.	• Construction • Operations	• Negative effects due to emissions to air and generation of dust. Leaks and spills of volatile substances can contaminant air.	• Owner / operator to establish working groups with Marten Falls First Nation, Aroland First Nation, and other interested Indigenous communities from the Regional Study Area, to meet regularly to discuss community-proposed topics in relation to the construction or operations of the Community Access Road, including concerns related to the biophysical effects on human health during construction, such as air, noise and vibration, sediment, soil, ground and surface water, and human land-use.	• Residual changes to human health due to emissions to air and generation of dust. Leaks and spills of volatile substances can contaminant air.	• Context: Impacts to air can be carried by wind • Direction: Negative • Magnitude: High Magnitude • Geographic Extent: Construction Disturbance Area • Duration: Long-term • Frequency: Continuous • Reversibility: Irreversibly • Likelihood: Possible • Uncertainty: Air deposition rates and maximum modelled air concentrations are not available from Technical Support Document for Air. Chemical concentrations in aggregate source for road (source of dust) not available from technical support document for soils.
• **Biophysical Determinants of Human Health - Noise**	• Construction • Operations	• Negative effects of unacceptable noise and vibration levels.	• Owner / operator to establish working groups with Marten Falls First Nation, Aroland First Nation, and other interested Indigenous communities from the Regional Study Area, to meet regularly to discuss community-proposed topics in relation to the construction or operations of the Community Access Road, including concerns related to the biophysical effects on human health during construction, such as air, noise and vibration, sediment, soil, ground and surface water, and human land-use.	• Residual changes to human health due to unacceptable noise and vibration levels.	• Context: Noise from blasting, quarrying, road construction, traffic and maintenance activities. • Direction: Negative • Magnitude: High • Geographic Extent: Construction Disturbance Area • Duration: Long-term • Frequency: Infrequent • Reversibility: Reversible • Likelihood: Certain • Uncertainty: Noise technical support document does not contain information on maximum noise levels expected for construction or maintenance or on distance noise may travel. Predicted traffic noise levels are within acceptable levels.

Valued Component	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Biophysical Determinants of Human Health - Sediment**	• Construction • Operations	• Negative effects due to deposition of dust or runoff into waterbodies could cause contamination of sediment; leaks and spills can contaminate sediment.	• Owner / operator to establish working groups with Marten Falls First Nation, Aroland First Nation, and other interested Indigenous communities from the Regional Study Area, to meet regularly to discuss community-proposed topics in relation to the construction or operations of the Community Access Road, including concerns related to the biophysical effects on human health during construction, such as air, noise and vibration, sediment, soil, ground and surface water, and human land-use.	• Residual changes to human health due to deposition of dust or runoff into waterbodies could cause contamination of sediment; leaks and spills can contaminate sediment.	• Context: Impacts to sediment can occur subsequent to impacts to surface water. • Direction: Negative • Magnitude: Moderate • Geographic Extent: Construction Disturbance Area • Duration: Long-term • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Possible • Uncertainty: Air deposition rates and maximum modelled air concentrations are not available from Technical Support Document for Air. Chemical concentrations in aggregate source for road (source of dust) not available from technical support document for soils.
• **Biophysical Determinants of Human Health - Soils**	• Construction • Operations	• Negative effects due to deposition of dust could cause contamination of soils. Elevated background concentrations of metals in aggregate source areas could result in elevated concentrations in metals in dust generated, leaks and spills can contaminate soils.	• Owner / operator to establish working groups with Marten Falls First Nation, Aroland First Nation, and other interested Indigenous communities from the Regional Study Area, to meet regularly to discuss community-proposed topics in relation to the construction or operations of the Community Access Road, including concerns related to the biophysical effects on human health during construction, such as air, noise and vibration, sediment, soil, ground and surface water, and human land-use.	• Residual changes to human health due to deposition of dust could cause contamination of soils. Elevated background concentrations of metals in aggregate source areas could result in elevated concentrations in metals in dust generated, leaks and spills can contaminate soils	• Context: Contaminants in aggregate will impact air quality. Air impacts can be carried by wind. • Direction: Negative • Magnitude: Moderate • Geographic Extent: Construction Disturbance Area • Duration: Long-term • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Possible • Uncertainty: Chemical concentrations in aggregate source for road (source of dust) not available from technical support document for soils. Air deposition rates and maximum modelled air concentrations are not available from Technical Support Document for Air
• **Biophysical Determinants of Human Health – Groundwater**	• Construction • Operations	• Negative effect due to deposition of dust or runoff / infiltration into groundwater could cause contamination of water potentially used for drinking, bathing, or cooking. Leaks and spills can contaminate groundwater.	• Owner / operator to establish working groups with Marten Falls First Nation, Aroland First Nation, and other interested Indigenous communities from the Regional Study Area, to meet regularly to discuss community-proposed topics in relation to the construction or operations of the Community Access Road, including concerns related to the biophysical effects on human health during construction, such as air, noise and vibration, sediment, soil, ground and surface water, and human land-use.	• Residual changes to human health due to deposition of dust or runoff / infiltration into groundwater could cause contamination of water potentially used for drinking, bathing, or cooking. Leaks and spills can contaminate groundwater.	• Context: Groundwater may be source of potable water at camps. Some groundwater concentrations exceed drinking water standards. • Direction: Negative • Magnitude: High • Geographic Extent: Construction Disturbance Area • Duration: Long-term • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Possible • Uncertainty: Chemical concentrations in aggregate source for road (source of dust) not available from technical support document for soils.

Valued Component	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Biophysical Determinants of Human Health – Human Land Use**	• Operations	• Possible negative effect of increase in durations, extent, frequency and seasons spent engaged in land-use within the Local Study Area.	• Owner / operator to establish working groups with Marten Falls First Nation, Aroland First Nation, and other interested Indigenous communities from the Regional Study Area, to meet regularly to discuss community-proposed topics in relation to the construction or operations of the Community Access Road, including concerns related to the biophysical effects on human health during construction, such as air, noise and vibration, sediment, soil, ground and surface water, and human land-use.	• No residual effect anticipated.	• No residual effect anticipated.

9.5.7 Land and Resource Use

9.5.7.1 Project-Environment Interactions

An analysis of Project-environment interactions for community well-being that are likely to have a potential effect is provided in **Table 9.5-34**.

Table 9.5-34: Project-Environment Interactions – Land and Resource Use

Project Phases	Project Activities to Have Potential Effect on Land and Resource Use
• **Construction**	• Mobilization of Equipment and Supplies • Temporary Construction Staging Areas • Temporary Access Roads and Trails • Temporary Construction Camps • Right-of-way Clearing and Grubbing • Brush and Timber Disposal • Pits and Quarries • Temporary Concrete Batch Plants / Trails and Staging Areas • Drilling / Blasting / Aggregate Production • Road Construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) • Bridge and Culvert Installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) • Construction Site Restoration • Pits and Quarries
• **Operations**	• Road Usage • Road Maintenance

9.5.7.2 Discipline-Specific Characteristics

In support of the residual effects characteristics described in **Section 6.7.3**, **Table 6-1**, the following land and resource use definitions apply to the effects assessment.

Ecological and Social Context

The ecological context within which potential environmental, health, social, and economic effects may occur has been taken into account when considering the effects criteria, such as species sensitivity and resilience, and includes Indigenous Knowledge where it was available.

The social context of the effect includes a discussion of the social and cultural consequences of the predicted effect. The current and future sensitivity and resilience of the valued component to change caused by the Community Access Road has also been considered. The assessment includes the level of sensitivity and / or resilience.

Magnitude

For magnitude, environmental discipline-specific definitions are provided below in **Table 9.5-35**.

Table 9.5-35: Land and Resource Use Magnitude Definition

Magnitude Level	Definition	Rationale
• **Negligible**	• An effect that may or may not be discernible but is within the historical variability as defined by existing conditions. The effect is within the capacity of the Land and Resource Use system to respond and / or will not alter the current Land and Resource Use structures.	• Negligible effects are small and may not be noticeable. These effects do not represent a change in day-to-day Land and Resource Use.
• **Low**	• An effect that is small but discernable and within historical variability as defined by existing conditions. The effect is within the capacity of the Land and Resource Use system to respond and / or will not alter the current Land and Resource Use structures.	• Low effects are noticeable to some land and resource users. These effects do not represent a change in day-to-day activities.
• **Medium**	• An effect that is clearly discernable and beyond the historical variability as defined by existing conditions. The effect is within the capacity of the Land and Resource Use system to respond and / or will not alter the current Land and Resource Use structures.	• Medium effects are noticeable to some land users. These effects may or may not represent a change to day-to-day activities but can be adjusted to within the current Land and Resource Use system.
• **High**	• An effect that is clearly discernable and beyond the historical variability as defined by existing conditions. The effect is beyond the capacity of the Land and Resource Use system to respond and / or will alter the current Land and Resource Use structures.	• High effects are noticeable to land and resource users. These effects represent a change to day-to-day land use. In the case of adverse effects, these changes cannot be responded to within the current land and resource system resulting in systemic change.

9.5.7.3 Residual Effects - Construction Phase

9.5.7.3.1 Land Use Compatibility

9.5.7.3.1.1 Potential Effects

The Construction Disturbance Area is located on lands under jurisdiction of the *Far North Act* and the *Public Lands Act*. The Marten Falls First Nation Draft Community-Based Land Use Plan was considered as part of the effects assessment.

The Construction Disturbance Area overlaps with 1,257.1 hectares of lands identified as Dedicated Protected Area land use designation within the Marten Falls First Nation's Draft Community-Based Land Use Plan. The Draft Community-Based Land Use Plan has not been finalized or approved and continues to be developed. The land use designations and permitting land use activities within the Community-Based Land Use Plan, including the Dedicated Protected Area, are being developed in a manner that considers the proposed Community Access Road, associated aggregate sites, and supporting infrastructure. At the time of writing this report, the proposed route has not been withdrawn from mining claims.

Portions of the Preferred Route fall within lands that are managed by the Ministry of Natural Resources under Crown land management direction for Geraldton Area (general use area) through the Crown Land Use Policy Atlas. The Crown Land Use Policy Atlas provides policy direction for Crown Land use and in this area identifies permitted uses, including road development and aggregate extraction, subject to applicable approvals and permitting requirements. Existing land uses such as commercial outpost camps are administered under the *Public Lands Act*. As such, the types of infrastructure associated with the Community Access Road are consistent with existing Crown land use policy direction applicable to the area.

The majority of the Preferred Route falls within the Far North. In accordance with Section 14 of the *Far North Act*, existing rights for the acquisition, disposition, use or occupancy of public lands and activities associated with these uses (such as, commercial outpost camps) remain valid where they were established prior to the finalization of a community-based land use plan. As such, no land use compatibility associated with the Far North or *Public Lands Act* will have potential effects.

9.5.7.3.1.2 Mitigation and Enhancement Measures

The Marten Falls First Nation Draft Community-Based Land Use Plan remains under development and has not been finalized or approved. Land use designations and permitted land use activities, including those associated with Dedicated Protected

Areas, continue to be developed in a manner that contemplates the Community Access Road, associated aggregate sites, and supporting infrastructure.

In the interim, Crown land use decisions will continue to be guided by applicable provincial legislation and policy, including the *Far North Act*, the *Public Lands Act*, and direction provided through the Crown Land Use Policy Atlas. Once finalized, the Marten Falls First Nation Community-Based Land Use Plan will provide additional land use direction consistent with established planning processes.

Given the potential for new development opportunities that may arise as a result of improved access provided by the Project, it is recommended that Marten Falls First Nation and Aroland First Nation be involved in land and resource use planning discussions related to future development within areas of shared or overlapping traditional territories, in accordance with applicable Crown processes.

9.5.7.3.1.3 Predicted Residual Effects

No residual effects on land use legislation, policies, or plans are anticipated during construction.

9.5.7.3.2 Ontario Parks and Protected Areas

9.5.7.3.2.1 Potential Effects

The Construction Disturbance Area transects the Albany River Provincial Park. Approximately 5.7 hectares of Park land would be affected during construction, with a road length of approximately 0.6 kilometres through the Park. A new bridge would also be constructed to cross the Albany River.

These activities represent a direct adverse effect related to vegetation removal and localized disturbance within the Park. From a geographic perspective, the area effected represents a very small proportion of the overall Park area. The Albany River will remain navigable for the types of watercraft typically used in the area.

Recreational activities within the Albany River Provincial Park include occasional canoeing, kayaking and sport fishing. Due to the remote nature of the park, recreational use is limited and difficult to quantify. During construction, users in proximity to the bridge crossing may experience temporary noise effects. Construction noise levels at the bridge crossing location may reach up to 70 A-weighted decibels, decreasing to approximately 30 A-weighted decibels at a distance of 5 kilometres, over a period of up to two years. No campsites are located within the Construction Disturbance Area; however, there is a 40 metres portage used to bypass Snake Rapids located in the proposed crossing construction area. Park users may also experience noise from aggregate extraction at pits

located on the south side of the Park just west of the proposed crossing location. Continued engagement with Ontario Parks will be completed through the detail design so ample notification to Park users can be provided.

The sequence of construction will be completed in a phased in approach. Construction will occur in phases, and localized construction-related effects will decrease as work progresses beyond the Park. Temporary effects on air quality (for example, dust) may occur during construction. Further detail on air quality effects is provided in the Atmospheric Environment Technical Support Document found in **Appendix S**. The Preferred Route is located near, but does not intersect the Ogoki River Provincial Park. No direct land removal will occur within the Park. A limited amount of the most eastern end of the Park (about 500 metres) would experience noise effects greater than 45 A-weighted decibels, which is considered to be a noticeable change to the existing conditions.

The Ogoki River Provincial Park may experience temporary changes in air quality (dust) given the distance of the eastern park boundary to the Construction Disturbance Area (0.8 km).

Little Current River Provincial Park, Otoskwin–Attawapiskat River Provincial Park, Nakina Moraine Provincial Park, and the Jobes Creek Area of Natural and Scientific Interest are located at distances sufficient to preclude direct or indirect construction-related effects. Little Current River Provincial Park is located approximately 14.7 kilometres from the proposed road route and 3.7 kilometres from the southernmost aggregate pit site. Otoskwin–Attawapiskat River Provincial Park is located approximately 33.6 kilometres from the proposed road route and 37.1 kilometres from the northernmost aggregate pit site. Nakina Moraine Provincial Park is located approximately 61.3 kilometres from the proposed road route and 62.8 kilometres from the southernmost aggregate pit site. Jobes Creek Area of Natural and Scientific Interest is located 27.5 kilometres from the proposed road and aggregate sites that precludes construction-related noise or air quality effects. Further details are available in Atmospheric Environment Technical Support Document in (**Appendix S**).

No indirect effects related to this indicator were identified.

9.5.7.3.2.2 Mitigation and Enhancement Measures

Parks related mitigation and enhancement measures to be implemented during construction of the Project include:

- Refer to mitigations as outlined in the Atmospheric Environment Technical Support Document (**Appendix S**);

- Limit clearing and use of land within the Parks as much as possible. Temporary work areas such as staging areas should be located outside of parks;
- Monitor and limit the development of any side trails / roads that might extend into the parks. Marten Falls First Nation and the Owner of the road will engage with Ontario Parks to determine any measures to control access into parks and protected areas where applicable and refer to the amended Albany River Provincial Park Management Statement; and,
- Continued engagement between Ontario Parks, Marten Falls First Nation and the owner of road should continue into the detail design phase to encourage bridge designs that could commemorate the culturally significance and history of the Albany River waterway.

9.5.7.3.2.3 Predicted Residual Effects

Residual effects considered include vegetation removal, noise, air quality, visual effects, and changes in access.

Albany River Provincial Park will experience minor adverse residual effects, including localized vegetation removal (5.7 hectares), temporary construction-related noise and air quality effects, and a localized reduction in wilderness character due to bridge visibility. These effects are limited in geographic extent, largely reversible, and affect a small proportion of the Park.

Noise and air quality effects during construction are short-term and localized. No designated campsites occur within the affected area. Effects on other provincial parks and protected areas are not anticipated due to distance from the Project.

Considering the ecological and social context, magnitude, geographic extent, duration, and reversibility of effects, residual effects on Parks and Protected Areas are assessed as not significant**.**

9.5.7.3.3 Recreation and Tourism

9.5.7.3.3.1 Potential Effects

The road, which will be approximately 184 kilometres, has the potential to improve access to remote Crown land and water resources if opened for public use. Improved access could provide new recreation and tourism opportunities, including camping, snowmobiling, hunting, fishing, and canoeing / kayaking, representing a potential beneficial effect on recreation and tourism.

In contrast to these benefits, increased access could adversely affect some remote outfitter operations.

Aroland First Nation and other community members have indicated their preference for controlled access along the road, which if implemented, would limit access to the public. At this stage, access arrangements have not been finalized and will depend on future decisions by the road owner and applicable authorities.

Considering the road will not have many secondary roads or trails at the time of construction, recreational access is expected to occur primarily via waterways during the spring, summer and fall months, while winter months could attract snowmobiling.

The development of bridges and culverts over watercourses could potentially affect navigation (for safety purposes) during construction of the Project. Clear span bridges will be required at water crossings with bank full widths greater than 5 metres and less than 30 metres, and bridges with piers and abutments will be required at water crossings greater than 30 metres. Bridges will be designed to meet the 1 in 100-year flood scenario design, fish passage requirements, and navigable requirements, based on federal and provincial regulations. Water crossings that require either a clear span bridge or multi-span bridge can be found in the Surface Water Technical Support Document (**Appendix F**). Net effects to navigation are expected to be temporary during construction as navigation will be maintained on waterways determined to be navigable during operations. Required permits under the Canadian Navigable Waters Act will be obtained prior to construction.

The construction the Project could result in disruption effects and enjoyment to recreation and tourism activities (for example, disturbances from changes in noise, vibration, air quality, and viewscapes).

There are no formal campgrounds in the Construction Disturbance Area, however, there is a portage located close to the proposed Albany River Bridge crossing which would be maintained during construction (navigability). Recreation features in the Local Study Area include water access recreation such as canoeing and boating.

Due to the remote nature of the Local Study Area and limited existing access, recreational use outside provincial parks and remote outfitter areas is understood to be limited. While noise and air quality changes will occur in close proximity to the road and ancillary facilities (aggregate pits) during the construction, effects on recreational use are assessed as localized, intermittent, and low in magnitude for both construction and operation due to the low number of visitors.

The sequence of construction will be completed in a phased in approach. Once construction of a given road length is complete, construction will move along the Construction Disturbance Area, and the magnitude of the impact will decrease over time. These localized periods of construction will have potential for effects on air quality, due to Nitrogen Dioxide, Sulfur Dioxide, Carbon Monoxide, Total Suspended Particulates and Particulate Matter 2.5 and 10 emissions. Further detail on air quality effects is provided in the Atmospheric Environment Technical Support Document (**Appendix S**).

The development of the Project could influence the availability of species harvested for recreational purposes through localized habitat removal and changes in access to lands and waterways used for hunting and fishing. Habitat removal associated with the Project is expected to be limited in extent and localized to the Construction Disturbance Area.

Improved access resulting from the Project could increase recreational hunting and fishing opportunities in the vicinity of the road. From a recreation and tourism perspective, effects are expected to be related primarily to changes in access and user distribution rather than Project-related changes in overall species abundance.

Potential effects related to wildlife habitat, species abundance, population dynamics, and sustainability are assessed under the wildlife, ungulates, and fish valued components. Wildlife and fish populations are managed through existing provincial programs administered by the Ministry of Natural Resources.

9.5.7.3.3.2 Mitigation and Enhancement Measures

Typical mitigation and avoidance measures such as standard practices for camp construction, road and water crossing construction will be applied during construction of the Project. Such measures include:

- Design and installation of water crossing structures to accommodate flow, drainage, fish passage (where applicable), and navigability requirements in accordance with federal and provincial regulations;
- Minimization of vegetation clearing to areas required for construction, staging, and operations;
- Progressive reclamation and revegetation of disturbed areas no longer required following construction (for example, temporary access roads, construction camps, and laydown areas);
- Restriction of public access during construction for safety reasons;

- Provision of signage along the Preferred Route to support safe interaction between road users and recreational users; and
- Coordination with Ontario Parks and relevant authorities where recreational features (for example, portages, waterways) may be affected.
- Rehabilitation and revegetation of areas disturbed during construction but are no longer deemed necessary for operations will promote wildlife species to return to the area.
- Mitigation measures related to fish and fish habitat and wildlife originate from the Fish and Fish Habitat Technical Support Document (**Appendix G**) and Ungulates Technical Support Document (**Appendix M**) and are addressed under those valued components. Additional mitigation and monitoring related to wildlife populations, hunting pressure, and fish harvest will continue to be managed through existing provincial programs.
- Vegetation clearing limits, buffer zones, and erosion and sediment control measures associated with waterbodies will be implemented in accordance with Project design requirements and applicable regulatory approvals.

9.5.7.3.3.3 Predicted Residual Effects

The amount of recreation activity that occurs on crown land within the Construction Disturbance Area is limited due to the remote nature of the area and the lack of access.

Potential construction noise effects on crown land potentially used for recreation were assessed to be local in geographic extent and short-term / reversible. No recreation receptor locations were identified. These effects are considered to be not significant.

As a result, adverse residual effects on Recreation and Tourism are assessed as not significant.

9.5.7.3.4 Extractive Resource Industry

9.5.7.3.4.1 Potential Effects

Removal of lands with potential for mineral extraction, as measured through area of land under mining claims that the road segments pass through.

Within the Construction Disturbance Area there are 2,234 hectares of existing mining claims, which could be affected by the road and associated Project components. Two mining companies will be affected by the development of the Community Access Road: Wabassi Resources and Canada Chrome Corporation.

Based on interviews with claim holders including Wabassi Resources and KWG Resources, no specific preferences were provided during the route selection phase. Claim holders were advised of the Preferred Route in Fall 2024 with a request for comments. Additional letters were sent in spring 2025 requesting feedback on the Preferred Route, no comments were received from these letters, neither company commented on the Draft Environmental Assessment / Impact Statement. As such, it is assumed that the deposits in the affected claims are large enough to provide flexibility in the development of future mines. Therefore, negligible adverse effects to mineral development are anticipated from the Project.

It is noted that an aggregate pit is located on the site of an existing Wabassi Resources exploration camp that is under a lease from the Ministry of Natural Resources. It is not known how long this exploration camp is set to operate. Further consultation is required with Wabassi Resources to better understand this camp and potential impacts to it from this Project.

9.5.7.3.4.2 Mitigation and Enhancement Measures

Mining companies have indicated their support of the Project due to the increased accessibility that would result allow for development of future mines from these mining claims.

Mitigation and enhancement measures for the extractive resource industry include engaging with mining claim holders in the road design stage to determine how impacts to any mineral deposits can be minimized and / or how the Project can help to support their activities.

9.5.7.3.4.3 Predicted Residual Effects

The Construction Disturbance Area intersects approximately 2,234 hectares of existing mining claims, resulting in a localized adverse residual effect related to land occupation and potential constraints on mineral development.

Engagement with affected claim holders did not identify specific concerns regarding the Preferred Route or indicate that the Project would preclude future mineral exploration or development. The road occupies a limited portion of the affected claims, and mining activities could continue to be planned and permitted following construction, subject to applicable regulatory approvals.

Improved access resulting from the Project represents a beneficial effect for the extractive resource industry by facilitating future exploration and development opportunities; however, the realization of these benefits would depend on separate project proposals, regulatory approvals, and market conditions.

Considering the limited spatial extent of overlap, the absence of identified constraints on mineral development, and the increased accessibility to claim areas, adverse residual effects on the Extractive Resource Industry are assessed as not significant.

9.5.7.3.5 Forestry Industry

9.5.7.3.5.1 Potential Effects

The Ogoki Forest is approximately 1,087,986 hectares in size. The Construction Disturbance Area overlaps 384.4 hectares of the Ogoki Forest (bog, forest, marsh, swamp, water, rock, fen, and anthropogenic). Of that, 195.4 hectares of forest (coniferous, deciduous, early successional / sparse treed, and mixed) would be removed through construction of the road and potential development of two aggregate pits. There is the potential for direct effects on the Ogoki Forest via removal of commercial forestry land during construction, however, given the percentage of the area affected (roughly 0.04 percent of the total area of the Ogoki Forest), this effect is expected to be negligible. The Project has the potential to increase access to lands northeast of the Ogoki Forest that could contain merchantable timber stands resulting in a positive Project effect.

Due to the lack of actively harvested forestry lands within the Construction Disturbance Area outside of the Ogoki Forest, the Project will have minimal adverse direct or indirect effects to this valued component. Forestry companies were advised of the Preferred Route in Fall 2024 and Spring 2025 with a request for comments.

9.5.7.3.5.2 Mitigation and Enhancement Measures

While not anticipated, should any commercial forest trees be felled within the Ogoki Forest Management area for Construction, the value of the timber will be determined and be the responsibility of the Sustainable Forest Licence holder to dispose of.

Areas outside of the Ogoki Forest that are to be cleared for construction will require to be scaled for its value and the Proponent should consult with the Ministry of Natural Resources to determine options for the harvested timber. Any timber that is deemed merchantable (anything greater than 10 centimetres diameter outside the bark) must be valued. Area that does not have a Forest Management Unit, a permit must be granted to the Proponent to harvest the trees and to properly sell or dispose of.

9.5.7.3.5.3 Predicted Residual Effects

Adverse residual effects on the Forestry Industry are not expected, as the Construction Disturbance Area overlaps approximately 0.24 percent of the Ogoki Forest, representing a negligible to low magnitude effect relative to the overall forest

management unit. Any merchantable timber removed for the Project will be managed and compensated in accordance with applicable Crown forest management requirements.

Given the limited spatial extent of overlap, the short duration of clearing activities, and the capacity of existing forest management and compensation frameworks to address localized timber removal, residual effects on the Forestry Industry are assessed as not significant.

9.5.7.3.6 Remote Outfitters

9.5.7.3.6.1 Potential Effects

Information regarding commercial outpost camp land use permits potentially affected by the Project was collected from the companies (remote outfitters) operating these sites. Coordinates, screen shots, or descriptions were provided and then digitized. The descriptions of distances from the Construction Disturbance Area should be considered as being from the lake where the camp is located and not the actual location of the camp and are therefore approximate until outreach can be completed. Remote outfitters were advised of the Preferred Route in Fall 2024 and Spring 2025 with a request for comments.

Outfitters expressed concerns that the Project, if opened to the public, would allow greater access to their camp locations / areas of operations, potentially affect wildlife and fish populations, and result in their camps being less attractive to their customers (Andomoozwe Outfitters; Boreal Outfitters; Dusey River Outfitters; Gray Wood Outfitters; Tom's Outpost Camps; O'Sullivans Rainbow; Wilderness North; Nakina North Outfitters; Hearst Air; Leuenberger Air Service, personal communication, 2022). The remote outfitters indicated that users with a specific interest in visiting remote outfitting camps may no longer be interested if a road providing access replaces flights.

Six remote tourism outfitter camps were identified closest to the Project location, within 5 km of the Construction Disturbance Area:

- Esser Lake (Twin Lake Outfitters): 4.3 kilometres
- Painter Lake (Leuenberger Air Service): 0.5 kilometres
- Percy Lake (Leuenberger Air Service; Nakina North Outfitters): 4.8 kilometres
- Painter Lake (Leuenberger Air Service): 4 kilometres
- Caviar Lake (Leuenberger Air Service): 0.9 kilometres
- Leuenberger's Teabeau Site: 4.4 kilometres

There are two types of Land Use Permits issued by the Government of Ontario: those for restricted (Type B) outpost camps (in other words, short term seasonal use; limited infrastructure) and Type A commercial outpost camps (in other words, long term use year after year; permanent infrastructure). Though the Construction Disturbance Area does not directly overlap any remote outfitter camps, changes to the land resulting from both construction and operation of the Project may result in less people using these services. There were no restricted (type B) Land Use Permits identified in the Construction Disturbance Area, given that these types of Land Use Permits are set up in the same areas annually, it is not anticipated that these would be impacted. Unless explicitly noted in the Land Use Permit's Standard Conditions, restricted Land Use Permits expire after hunting seasons close for that year. Remote outfitters are then responsible for reapplication. Given that there were none identified, there would be no impact to these types of Land Use Permits.

Changes in environmental conditions, including air quality, noise, visual, surface water, fish abundance / distribution, wildlife abundance distribution, as well as a change in access may cause indirect effects to remote outfitters. Changes related to environmental conditions may change the attractiveness of these camps to their client base. The following describes changes in environmental conditions in the vicinity of the noted camps.

Air Quality

Once construction of a given road length is complete, construction will move along the Construction Disturbance Area, and the magnitude of the impact will decrease over time. These localized periods of construction will have potential for effects on air quality, which can be found in the Appendix S.

It is expected that a high magnitude of particulate matter concentrations are predicted to impact recreational users within 3 kilometres from the road due to fugitive road dust generated from vehicular travel on the unpaved road during operations. However, this is based on the maximum vehicular traffic volume on the road occurring in 2046 (Appendix S) this level of traffic is not anticipated but was used to provide an uppermost limit for the impacts being considered. Painter Lake (if upgrades to the Painter Lake Road) and Caviar Lake camps are expected to be impacted by air quality given the results outlined above.

Noise

Commercial outpost camp locations could also experience noise effects from road construction and during operations which could detract from the user experience and make these camps less attractive to the outfitter and potentially their clients. **Table**

9.5-36 outlines the noise levels for the six camps closest to the Construction Disturbance Area and others that will be affected by noise during construction and operations of the Project.

Table 9.5-36: Noise Results for Remote Outfitter Camps, within 5 kilometres of Construction Disturbance Area

Camp	Construction Phase	Operations Phase
Esser Lake (Twin Lake Outfitters)	• Not applicable; outside impact area	• Outside impact area
Painter Lake (two camps) (Leuenberger Air Service)	• Less than 45 A-weighted decibels for road construction and 45 to 60 A-weighted decibels from aggregate pit construction	• Outside impact area; aggregate pit (ID14) north of Painter Lake to be used during construction only
Percy Lake (Leuenberger Air Service; Nakina North Outfitters)	• Not applicable; outside impact area	• Outside impact area
Caviar Lake (Leuenberger Air Service)	• 50 to 55 A-weighted decibels from road and bridge construction	• 30 A-weighted decibels approximately 1.5 kilometres from bridge location (exact location to be determined through outreach)
Teabeau (Leuenberger Air Service)	• 30 to 35 A-weighted decibels for a small eastern section of the lake / river	• Outside impact area

The Painter Lake camp and the Caviar Lake camp are likely to experience the highest impact from noise during construction and operation phases; however, noise levels are below or equal to the Health Canada Limit Guide of 55 A-weighted decibels.

Visual

With regards to visual effects as discussed in Appendix V of the Environmental Assessment / Impact Statement, Painter Lake and Caviar Lake are likely to experience the highest visual impact during construction and operation of the Project. Painter Lake is approximately 970 metres from the nearest aggregate site, if this site is utilized in the upgrades to the existing road infrastructure of Painter Lake Road. Caviar Lake's distance from the nearest aggregate site is 1.7 kilometres from the bridge crossing at the Albany River. It is not expected to be seen from the commercial outpost camp location but could potentially be seen while fishing along the river. The Caviar Lake site is also located 880 metres from an aggregate site. The kind of extraction activities at that aggregate site location will be determined during detail design.

Surface Water

As some remote outfitters offer fishing opportunities via boating, effects on surface water (for navigational purposes) are not anticipated to result in an adverse change beyond a manageable level. Some short-term effects may result in temporary impacts to navigation during construction to maintain public safety. Appropriate mitigation is discussed below.

Fish Abundance / Distribution

Northern pike, brook trout, and walleye may all experience effects from the Project, particularly during construction from loss of habitat (bridge construction) and saltation effects. Due to increased access to the area and to remote outfitting camps, there could be increased fishing pressure on the waterways in proximity to the road which could also adversely impact species abundance. Spills during the construction and operations in high enough concentrations may also negatively affect fish and fish habitat. However, fish populations are expected to be self-sustaining and ecologically effective and do not represent a substantial management concern (Appendix G) Appropriate mitigation will be required during construction and operations to reduce or avoid impacts to these species.

Wildlife Abundance Distribution

The Project is expected to result in an increase in public access and with potential for hunting opportunities for Indigenous and non-Indigenous hunters in the vicinity of the road during operations, which may lead to decreased moose abundance. Moose mortality risk from hunter harvest may increase, particularly for moose in Wildlife Management Unit 17 with home ranges near the Community Access Road (such as, local to regional effect). It is expected that hunting pressure will be monitored by the Ministry of Natural Resources and controlled through the issuance of hunting tags. It is also expected that there will be potential impacts from increase vehicular travel on the road which could impact wildlife populations.

Moose health may be impacted from the introduction of roads with concerns that increased access to the area resulting from the operation of the Community Access Road there could be an increase in illegal hunting / poaching. This could affect moose populations over time, which could result in impacts to the number of tag allocations a remote outfitter would receive for potential clients.

Change in Access

The construction of the road would mean that lands and waterbodies are more accessible to the public (if the road is not restricted) and decrease the attractiveness of

the area for remote tourism operations. Aroland First Nation has indicated their preference for controlled access along the road and have expressed they do not wish to have any new commercial outpost camps in the area.

Considering the above, construction of the Project is expected to contribute to a change in the remote / wilderness character of the area where some of the commercial outpost camps are located and could potentially reduce their attractiveness for clients, resulting in a decrease in business. The commercial outpost camps at most risk to this include: Painter Lake, due to a proposed aggregate pit on the north side of the lake; Caviar Lake, due to the crossing of the Albany River just to the east of the camp location (<1 kilometres and proposed pits to the south); and to a lesser extent Teabeau Lake, due to improved access to the Albany River and the potential for more boats / fishing in the area. Although the ownership of the road and the public versus restricted access of the road is unknown, there are potential noise impacts from vehicular traffic or aggregate operations. These commercial outpost camps may become less attractive, and the outfitters may decide to sell their camps and their moose tag shares. This is considered to be a direct adverse effect to these camps. Given the possibility of new access opportunities to the Caviar Lake and Teabeau Lake camps (accessible by boat via the Community Access Road) it may be possible to create boat in opportunities for these sites as they would no longer require fly-in access and be more economical for use. This would however require a boat launch for the area. At the time of writing this report, there are currently no design considerations for constructed access points for the Albany River.

9.5.7.3.6.2 Mitigation and Enhancement Measures

Proposed mitigation to minimize effects are as follows:

- Engage further with the impacted outfitters / camp owners (during detail design);
- Engage with the Province (Ministry of Natural Resources) to develop signage for hunting restrictions and to report poaching;
- Review options for access points at the Albany River Bridge Crossing;
- Marten Falls First Nation and the owner of the road should engage with Ministry of Natural Resources regarding how fish populations may be monitored;
- Provide at least one year notice to the remote outfitters in advance of construction start; and
- Implement mitigation measures for air quality, noise, visual, surface water, fish, wildlife, and ungulates as outlined in the appropriate technical support documents.

- Proposed mitigation to minimize effects on this valued component, as outlined in the Wildlife Technical Support Document (**Appendix K**) are as follows:
- The possession and use of firearms will not be permitted for construction personnel;
- The owner of the road may provide compensation for business losses to remote outfitters who are impacted by construction and operations of the Community Access Road;
- Restrict public access to the Community Access Road corridor during construction. Restrict temporary access roads and restore as soon as possible after they are no longer needed. Permanent access roads used for maintenance activities and aggregate pits will be gated while not in use;
- Develop and implement an Environmental Protection Plan that includes the following measures to control, and / or restrict public use of access roads during construction and operation: speed limits, signage, reduced road standard, natural berms across temporary access roads after reclaimed / rehabilitated, removal of temporary watercourse crossings, reduce traffic by locating camps near construction sites. Posting of restricted access and speed signage will follow the Construction Specification for Temporary Traffic Control Devices (Construction Specification for Temporary Traffic Control Devices, 2016).

9.5.7.3.6.3 Predicted Residual Effects

Adverse residual effects are anticipated for remote outfitting operations at Painter Lake, Caviar Lake, and Teabeau Lake as a result of increased access to the area, development of aggregate pits, and Project-related noise, particularly during construction. These effects are associated primarily with changes in access conditions and a localized reduction in wilderness character, which may influence the user experience for clients seeking fly-in, remote outfitting opportunities.

The magnitude of these effects on remote outfitting operations is assessed as low as effects are localized to areas in proximity to the road and aggregate sites and do not result in the physical removal of outfitting infrastructure.

Changes in access may result in increased presence of other land users in the area, which could further influence wilderness character and outfitter client experience. However, these effects are dependent on future access management decisions and user behaviour and are not expected to result in the displacement or closure of outfitting operations.

Effects related to the availability of species harvested for recreational hunting and fishing are not anticipated to be severe. Residual effects on fish and fish habitat were assessed as negligible to medium in magnitude and not significant in the fish and fish habitat valued component. Residual effects on moose and moose habitat were assessed as low to medium in magnitude, ranging from localized to regional in geographic extent, with populations expected to remain self-sustaining and ecologically effective. As such, effects on wildlife and fish availability relevant to outfitting operations are not expected to represent a substantial management concern.

Remote outfitting camps operate under Land Use Permits, which represent a limited tenure on Crown land. While this does not diminish the importance of outfitting operations, it indicates an existing level of exposure to changes in land use conditions. Camp operators will be provided with advance notice of construction activities (minimum one year), allowing for operational planning and adaptation. In addition, improved access may create opportunities for some operators to adjust service models (for example, drive-in or boat-access camps), partially offsetting adverse effects related to remoteness.

Considering the magnitude, duration, geographic extent, reversibility, and the capacity of outfitting operations to adapt, adverse residual effects on the remote outfitters valued component are assessed as not significant.

9.5.7.3.7 Trapping

9.5.7.3.7.1 Potential Effects

The Project footprint (including the road, aggregate pits, construction staging areas, and work camps) overlaps with seven trapline areas: GE138, GE148, GE153, GE154, GE157, GE159, and GE164. This section describes the changes to land that may be used for trapping activities within the above seven trapline tenures as a result of Project development. Following this, a description of how the Project could impact furbearing wildlife species populations, which could also have an impact on trapping activity, is presented.

Multiple attempts were made to contact trappers registered to each of these traplines through the Ministry of Natural Resources contact information. Letters were prepared and sent to the Ministry of Natural Resources for distribution to the trapline holders on record. No responses were received. Trapping related information was also acquired through the Indigenous Knowledge information that was requested from the communities to form the foundation for existing conditions including potential impacts to Aboriginal and / or Treaty Rights and Interests. At the time of drafting this assessment, Indigenous Knowledge was submitted by Marten Falls First Nation, Weenusk First Nation, Fort Albany First Nation, Aroland First Nation and Kashechewan First Nation which has been considered in this assessment, meaning that this information has been

included into the scientific data collected. It is understood that the holders of these traplines are all Indigenous people that live in either Marten Falls First Nation, Aroland First Nation, and / or other communities. Feedback from both Marten Falls First Nation and Aroland First Nation during the Community Information Centres was also utilized in this effects assessment.

As is the case for northern Ontario and much of Canada, trapping activity as a commercial activity has been greatly diminished over the last 20 years or so because of the low price of fur pelts. The prices narrowly covers the costs to undertake trapping (in other words, snowmobiling and fuel). Trapping does however, to some extent, still occur as a cultural activity for Indigenous people. Trapping impacts have also been assessed regarding potential impacts on Indigenous rights. Anecdotal information provided by community representatives at Project engagement events suggests that very limited trapping activity occurs now.

Below describes the loss of area from the Project for each affected trapline. In addition to the direct loss of lands that support furbearing species, disturbance effects from construction activities including the presence of humans and construction noise may result in some species moving from the adjacent lands. This disturbance would be a temporary effect but could still last up to ten years although the length of period for any one area of the Project would be much less given the sequencing of the construction.

Commercial trapping and snaring activities covered large geographic areas that extend approximately 30 km on either side of the Albany River and through the proposed Community Access Road route. Marten Falls First Nation identified 13 commercial harvesting sites which are used for trapping and snaring for commercial purposes.

GE138

GE138 covers an area of approximately 58,720 hectares. This trapline is transected by the following Project components: aggregate sites. More specifically, the Construction Disturbance Area overlaps 148.6 hectares of GE138, which is about 0.25 percent of the total trapline area. At the time of preparing this assessment no specific information from the trapline holder was available. It is not known whether trapping activity continues in this trapline or in the vicinity of the Project.

GE148

GE148 covers an area of approximately 858,208 hectares. This trapline is transected by the following Project components: access road, aggregate sites, camp, camp access road, and preferred route. More specifically, the Construction Disturbance Area overlaps 507.7 hectares of GE148, which is about 0.06 percent of the total trapline area. At the

time of preparing this assessment no specific information from the trapline holder was available. It is not known whether trapping activity continues in this trapline or in the vicinity of the Project.

GE153

GE153 covers an area of approximately 8,460,190 hectares. This trapline is transected by the following Project components: access road, aggregate sites, camp, camp access road, and preferred route. More specifically, the Construction Disturbance Area overlaps 1,036.1 hectares of GE153, which is about 0.01 percent of the total trapline area. At the time of preparing this assessment no specific information from the trapline holder was available. It is not known whether trapping activity continues in this trapline or in the vicinity of the Project.

GE154

GE154 covers an area of approximately 1,545,374 hectares. This trapline is transected by the following Project components: access road, aggregate sites, camp, camp access road, and preferred route. More specifically, the Construction Disturbance Area overlaps 630.4 hectares of GE154, which is about 0.04 percent of the total trapline area. At the time of preparing this assessment no specific information from the trapline holder was available. It is not known whether trapping activity continues in this trapline or in the vicinity of the Project.

GE157

GE157 covers an area of approximately 13,531,800 hectares. This trapline is transected by the following Project components: access road, aggregate sites, camp, camp access road, and preferred route. More specifically, the Construction Disturbance Area overlaps 1,921.3 hectares of GE157, which is about 0.01 percent of the total trapline area. At the time of preparing this assessment no specific information from the trapline holder was available. It is not known whether trapping activity continues in this trapline or in the vicinity of the Project.

GE159

GE159 covers an area of approximately 2,413,206 hectares. This trapline is transected by the following Project components: access road, aggregate sites, and preferred route. More specifically, the Construction Disturbance Area overlaps 203.8 hectares of GE159, which is about 0.008 percent of the total trapline area. At the time of preparing this assessment no specific information from the trapline holder was available. It is not known whether trapping activity continues in this trapline or in the vicinity of the Project.

GE164

GE164 covers an area of approximately 579,021 hectares. This trapline is transected by the following Project components: access road, aggregate sites, camp, camp access road, and preferred route. More specifically, the Construction Disturbance Area overlaps 252.3 hectares of GE164, which is about 0.044 percent of the total trapline area. At the time of preparing this assessment no specific information from the trapline holder was available. It is not known whether trapping activity continues in this trapline or in the vicinity of the Project.

Change in Environmental Conditions

Changes in environmental conditions, including noise and wildlife abundance distribution may cause indirect effects to trapping. Though trapping as a commercial activity has diminished in this area, changes to these conditions as outlined below could impact trapping activity that remains.

Noise

Noise could disturb trappers operating in the vicinity of the Project as well as furbearers resulting in less abundance close to the Project location. As documented in the Acoustic and Vibration Environment Technical Support Document (**Appendix P**) the magnitude of the noise net effects during construction were assessed to have the potential to range from low to high, depending on the distance between the points of reception and the construction activities. Daytime noise levels in proximity of the road from various aspects of construction are predicted to range from 38 to 84 A-weighted decibels. However, not all construction activities are expected to occur at the same time as modelled and therefore, in reality, noise levels should be lower. During operations, noise levels are to range from 38 to 53 A-weighted decibels. Note that with a background noise level of about 38 A-weighted decibels, noise levels of 45 A-weighted decibels or greater are considered to be noticeable.

Noise during construction is characterized as being local in nature, infrequent and temporary for any specific receptor point along the road. Noise in the vicinity of the aggregate pits may last longer depending on the size and life of the pit. All seven traplines intersecting the Construction Disturbance Area will experience short-term noise effects at infrequent levels during both construction and operations of the Project. The impact this noise might have on trapping is unknown. Trappers operating in the area may choose to conduct their activities further from the road because of increased noise levels.

Wolverine Abundance

Wolverine is a species that has been trapped in the Local and Regional Study Area. As reported in the Wildlife Technical Support Document (**Appendix K**), the magnitude of the predicted residual effects on wolverine are of moderate magnitude, permanent (irreversible) and vary from being confined to the effects assessment Construction Disturbance Area to the Wolverine effects assessment Local Study Area in geographic extent. It is expected that 4,700 hectares of wolverine habitat will be directly lost in the Construction Disturbance Area. Due to the high level of uncertainty related to how wolverines will respond once the Project is constructed, and the ability to avoid or mitigate effects on the regional population, effects to wolverine were assessed as significant. Considering the uncertainty of the assessment on the regional population impact on this species, the minimal commercial trapping currently occurring, the project's location on the edge of wolverine habitat, and anecdotal evidence suggesting that wolverines were not a major species trapped in the past, the resulting impacts on this valued component are considered to be low to moderate.

American Marten

American marten is a species that has been trapped in the Local Study Area. As reported in the Wildlife Technical Support Document (**Appendix K**), predicted residual effects on American martens are of negligible to low magnitude and are considered to be short-term to irreversible in duration. Most effects are considered to be limited to the Construction Disturbance Area, with increased access and sensory disturbance expected to extend into the Local Study Area. Overall, American marten populations are expected to remain ecologically functional and self-sustaining. The anticipated changes to American marten habitat availability, distribution, and survival and reproduction from the Project are expected to remain within the resilience and adaptability limits of the regional populations. As such, there is not expected to be a decrease in American marten populations to impact trapping activities.

Beaver

Beaver is the furbearer that has been historically trapped in the Local Study Area. As reported in the Wildlife Technical Support Document (**Appendix K**), overall, beaver populations are expected to remain ecologically functional and self-sustaining. The anticipated changes to beaver habitat availability, distribution, and survival and reproduction from the Project are expected to remain within the resilience and adaptability limits of the regional populations. As such, there is not expected to be a decrease in beaver populations to impact trapping activities.

As for all the furbearer species, increased trapping mortality may correspond to an increase in access to the lands along the corridor. This effect may be particularly strong in areas adjacent to good habitat. It is not possible to predict the impact that the increased access to the area might have on the populations of these species. Given that similar development in Northern Ontario has occurred as it relates to forestry operations and construction of roads, animal populations have been known to rebound once construction activities have been completed.

There are no anticipated effects on Gender-Based Analysis Plus sub-groups related to Trapping during construction or operations of the Community Access Road.

9.5.7.3.7.2 Mitigation and Enhancement Measures

Mitigation measures include providing notice to trapline tenure holders on the timeline and periods of construction and allow access through the Construction Disturbance Area (when it is safe to do so) as required for trapping activities throughout construction.

- Proposed mitigation to minimize effects as outlined in the Wildlife Technical Support Document (**Appendix K**), are as follows:
  - The possession and use of firearms will not be permitted for construction personnel;
  - Access to the Community Access Road corridor will be restricted during construction to workers only. Temporary access roads should be restricted during use and restored as soon as possible after they are no longer needed. Permanent access roads used for maintenance activities will be blocked while not in use;
  - Temporary access roads and other temporary construction infrastructure will be reclaimed as quickly as possible following construction. As part of the reclamation of temporary access roads, access to these roads will be physically blocked to decrease public use. Access roads used for permanent maintenance activities will be blocked while not in use;
  - Beaver lodges will be marked as sensitive sites and protected. A figure illustrating that location where beaver lodges were observed during existing conditions field surveys will be included in the Environmental Protection Plan. The Environmental Protection Plan will outline appropriate setbacks and procedures to be followed when beaver lodges are encountered during construction;
  - An Environmental Protection Plan will be implemented that includes the following measures to control, and / or restrict public use of access roads during construction and operation: speed limits, signage, reduced road

standard, felling of timber across temporary access roads after reclaimed, removal of temporary watercourse crossings, reduce traffic by locating camps near construction sites. Posting of restricted access and speed signage will follow the Construction Specification for Temporary Traffic Control Devices (Construction Specification for Temporary Traffic Control Devices, 2016);

9.5.7.3.7.3 Predicted Residual Effects

The Project Construction Disturbance Area intersects a very small proportion of each affected trapline area (less than 0.5 percent), resulting in a low magnitude adverse residual effect related to direct land occupation. The geographic extent of direct effects is localized to the road corridor, aggregate pits, and associated Project components, with the majority of each trapline remaining available for trapping activities.

Changes to access conditions represent a long-term effect associated with the operational phase of the Project and may influence trapping practices by increasing the presence of other land users along the corridor. While improved access may reduce travel time for trapline holders, it may also increase competition or disturbance in areas adjacent to the road. The magnitude of these access-related effects is assessed as low given the limited width of the corridor and the continued availability of extensive undisturbed areas within each trapline. The extent to which access-related effects materialize is dependent on future access management, enforcement, and user behaviour, introducing a degree of uncertainty in effect prediction.

Construction-related noise and activity may temporarily displace furbearing species and disrupt trapping activities in proximity to active work areas. These effects are assessed as low to moderate in magnitude, localized in extent, and short-term and reversible, as construction progresses sequentially along the corridor.

Potential effects on furbearer populations relevant to trapping vary by species. Residual effects on American marten and beaver populations are assessed as low in magnitude, with populations expected to remain self-sustaining and ecologically functional. In contrast, residual effects on wolverine were assessed as moderate in magnitude, permanent, and significant in the wildlife valued component due to habitat loss and uncertainty in population response. While wolverine trapping is understood to be limited in the Project area, uncertainty regarding population-level responses introduces a moderate level of risk to trapping opportunities associated with this species.

The combination of localized habitat loss, sensory disturbance, and increased access may contribute to incremental pressure on trapping activities within portions of the affected traplines. However, considering the small proportion of trapline areas directly affected, the localized nature of effects, the continued availability of extensive trapping

lands, and the limited current level of commercial trapping activity, the overall magnitude of cumulative adverse effects on trapping is assessed as moderate.

Recognizing the absence of trapper-specific information for several intersected traplines and the uncertainty associated with access-related effects and furbearer population responses, residual effects on trapping are characterized with moderate uncertainty. Continued engagement with trapline holders and follow-up monitoring would assist in refining the understanding of long-term effects.

Taking into account the magnitude, geographic extent, duration, reversibility, and uncertainty of effects, adverse residual effects on the trapping valued component are assessed as not significant at the local and regional scale. Also please refer to the Aboriginal and / or Treaty Rights and Interests Technical Support Document (**Appendix O**) regarding the impact of the Project on trapping in relation to Aboriginal rights.

9.5.7.3.8 Energy and Linear Infrastructure

9.5.7.3.8.1 Potential Effects

Energy and linear infrastructure refer to electricity infrastructure (such as generation stations, hydro-electric infrastructure, and transmission lines) and natural gas infrastructure (such as pipelines and extraction sites). At the time of writing this Report, there are no existing energy or linear infrastructure facilities or projects in development in the Construction Disturbance Area.

The Project will not result in the direct removal, relocation, or modification of existing energy or linear infrastructure.

9.5.7.3.8.2 Mitigation and Enhancement Measures

No project-specific mitigation measures are required for this valued component, as the Project does not directly involve the construction or modification of energy or linear infrastructure.

Coordination and information sharing between the province, the road owner, and relevant utility proponents may occur as part of future planning initiatives. Any proposed energy or linear infrastructure projects that utilize the Community Access Road corridor would be required to undergo separate environmental assessment and permitting processes, including the identification of project-specific mitigation and enhancement measures.

9.5.7.3.8.3 Predicted Residual Effects

The Project will not result in adverse residual effects on existing energy or linear infrastructure, as none currently occur within the Construction Disturbance Area. The establishment of the Community Access Road may create a long-term, indirect beneficial effect by increasing access and opportunity for future energy and linear infrastructure development.

9.5.7.4 Residual Effects – Operations Phase

9.5.7.4.1 Land Use Compatibility

9.5.7.4.1.1 Potential Effects

Portions of the Preferred Route fall within lands that are managed by the Ministry of Natural Resources under Crown land management direction for Geraldton Area (general use area) through the Crown Land Use Policy Atlas. The Crown Land Use Policy Atlas provides policy direction for Crown Land use and in this area identifies permitted uses, including road development and aggregate extraction, subject to applicable approvals and permitting requirements. Existing land uses such as commercial outpost camps are administered under the *Public Lands Act*. As such, the types of infrastructure associated with the Community Access Road are consistent with existing Crown land use policy direction applicable to the area.

The majority of the Preferred Route falls within the Far North. In accordance with Section 14 of the *Far North Act*, existing rights for the acquisition, disposition, use or occupancy of public lands and activities associated with these uses (such. commercial outpost camps) remain valid where they were established prior to the finalization of a community-based land use plan. As such, no land use compatibility associated with the Far North or *Public Lands Act* will have potential effects.

9.5.7.4.1.2 Mitigation and Enhancement Measures

Please refer to mitigation measures during construction.

9.5.7.4.1.3 Predicted Residual Effects

Effects are local in geographic extent, and operational impacts will persist for the duration of the project as long as the road remains in use. The effect is indirect, irreversible, and certain to occur.

9.5.7.4.2 Ontario Parks and Protected Areas

9.5.7.4.2.1 Potential Effects

The Albany River Provincial Park is recognized for its 'wilderness and remote character' and is valued for remote backcountry wilderness experiences. The road crossing through the Albany River Provincial Park (approximately 0.6 kilometres in length) and the presence of a bridge will introduce a localized visual feature, with the bridge visible approximately 900 metres upstream and 700 metres downstream as identified in the Visual Environment Technical Support Document (Appendix V).

Park users in proximity to the bridge may experience intermittent noise from vehicle traffic during Operations. Noise levels may exceed 35 A-weighted decibels within 1 km of the Albany River bridge location. Noise levels would be higher closer to the bridge crossing location. Baseline noise levels are about 35 to 40 A-weighted decibels and levels over 5 A-weighted decibels are noticeable. Noise effects will be intermittent and dependent on vehicle presence.

Fugitive dust from the unpaved road may affect areas within 3 kilometres of the crossing under maximum traffic conditions modeled for 2046 (**Appendix S**) this level of traffic is not anticipated but was used to provide an uppermost limit for the impacts being considered. Given the remote setting and anticipated low traffic volumes, these effects are expected to be infrequent and short in duration.

Ogoki River Provincial Park, Little Current River Provincial Park, Otoskwin–Attawapiskat River Provincial Park, Nakina Moraine Provincial Park, and Jobes Creek Area of Natural and Scientific Interest are not expected to experience operational noise or air quality effects due to distance from the road. A possible indirect effect related to this indicator is the potential for reduced Park users because of disturbance effects from road operations (for example, noise) and change in the wilderness character of the area from visibility of the bridge crossing (for the Albany River Park). The disturbance effects to the three parks noted above will be limited in area / localized and as a result, adverse impacts to park user volumes are not expected to be materially affected.

Once operational and if open for public use, the new road would provide a new access point to Albany River Provincial Park. Improved access could increase recreational use and support new canoe trip options. Any changes to access would be subject to Ontario Parks review and may require updates to the Albany River Provincial Park Management Statement. Public access would not be available during construction.

Improved access to the Ogoki River may also increase use of Ogoki River Provincial Park. Given the continued remoteness of the area, increases in user volumes are

anticipated to be limited. No changes in access are expected for Little Current River Provincial Park or other more distant protected areas.

There would be indirect effects as it relates to Operation, with improved access to the Albany River and Ogoki River Provincial Parks and possible increase in user volumes, this could detract from the wilderness character of these parks. Given the long driving distance still required to reach these parks, it is anticipated that user volumes would increase slightly as a result of introduced access.

Though no information or data is available related to the vulnerable groups for the Land and Resource Use Discipline, women / girls may feel unsafe or at-risk during construction of the Community Access Road should they be accessing the Albany River Provincial Park during that time. It is highly unlikely that youth will be accessing such a remote area unsupervised. There are no anticipated effects on Gender-Based Analysis Plus sub-groups related to Parks and Protected Areas during operations.

9.5.7.4.2.2 Mitigation and Enhancement Measures

Mitigation and enhancement measures to be implemented during operations include:

- Any potential access considerations will be explored further through ongoing consultation with Ontario Parks so that future decisions align with park management objectives and protection priorities.
- Refer to mitigations as outlined in the Atmospheric Environment Technical Support Document (**Appendix S**);
- Monitor and limit the development of any side trails / roads that might extend into parks; and
- The Owner of the road to continue to monitor and enforce (if deemed necessary) restricted access to Albany River Provincial Park at the bridge crossing to address access issues and user impacts.
- During maintenance works, the owner of the road should notify Ontario Parks of upcoming rehabilitation associated with the bridge to allow Ontario Parks to notify future Parks users.

9.5.7.4.2.3 Predicted Residual Effects

Improved access to Albany River and Ogoki River Provincial Parks represents a potential positive effect by increasing opportunities for recreational access in remote areas.

While increased access to Albany River Provincial Park could result in higher user volumes, the realization and magnitude of such effects would depend on road access

controls, traffic volumes, and Ontario Parks' management decisions. Given the continued remoteness of the area and existing Ontario Parks management authorities, a substantial increase in recreational use is not considered reasonably foreseeable at this time.

Considering the ecological and social context, magnitude, geographic extent, duration, and reversibility of effects, adverse residual effects on Parks and Protected Areas are assessed as not significant.

9.5.7.4.3 Recreation and Tourism

9.5.7.4.3.1 Potential Effects

The operation of the Project could result in disruption effects and enjoyment to recreation and tourism activities (for example, disturbances from changes in noise, vibration, air quality, and viewscapes). Recreation features in the Local Study Area include water access recreation such as canoeing and boating.

Due to the remote nature of the Project Local Study Area and limited existing access, recreational use outside provincial parks and remote outfitter areas is understood to be limited. While noise and air quality changes will occur in close proximity to the road and ancillary facilities (aggregate pits) during operations effects on recreational use are assessed as localized, intermittent, and low in magnitude for both construction and operation due to the low number of visitors.

Air quality effects during operations were assessed using conservative upper-bound traffic scenarios; given the remote setting and anticipated low traffic volumes, effects on recreational users are expected to be infrequent and short in duration.

The operation of the Project could influence the availability of species harvested for recreational purposes through localized habitat removal and changes in access to lands and waterways used for hunting and fishing. Habitat removal associated with the Project is expected to be limited in extent and localized to the Construction Disturbance Area.

Improved access resulting from the Project could increase recreational hunting and fishing opportunities in the vicinity of the road. From a recreation and tourism perspective, effects are expected to be related primarily to changes in access and user distribution rather than Project-related changes in overall species abundance.

Potential effects related to wildlife habitat, species abundance, population dynamics, and sustainability are assessed under the wildlife, ungulates, and fish valued components. Wildlife and fish populations are managed through existing provincial programs administered by the Ministry of Natural Resources.

9.5.7.4.3.2 Mitigation and Enhancement Measures

Mitigation measures related to fish and fish habitat and wildlife originate from the Fish and Fish Habitat Technical Support Document (**Appendix G**) and Ungulates Technical Support Document (**Appendix M**) and are addressed under those valued components. Additional mitigation and monitoring related to wildlife populations, hunting pressure, and fish harvest will continue to be managed through existing provincial programs.

Vegetation clearing limits, buffer zones, and erosion and sediment control measures associated with waterbodies will be implemented in accordance with Project design requirements and applicable regulatory approvals.

9.5.7.4.3.3 Predicted Residual Effects

Noise effects during operations is low in magnitude and localized in nature (close to the road and the few aggregate pits that would remain open). No recreation receptor locations were identified. These effects are considered not to be significant. For more details on noise, see Acoustic and Vibration Environment Technical Support Document (Appendix S).

Improved access may provide new recreational opportunities; however, the magnitude of change in recreational use will depend on future access controls and management decisions. Given the continued remoteness of the area and existing regulatory oversight, substantial changes to recreation and tourism patterns are not considered reasonably foreseeable.

As a result, adverse residual effects on Recreation and Tourism are assessed as not significant.

9.5.7.4.4 Extractive Resource Industry

9.5.7.4.4.1 Potential Effects

The operation of the road could have an **indirect effect** of improving access to mineral resource areas and facilitate the development of mines that would provide jobs and economic benefit to the region and local communities. Mining claim holders spoken to indicate support for the Project for this reason. As such, the Project is anticipated to result in a moderate to high benefit to mine development in the Local Study Area and Regional Study Area, specifically as it relates to a deposit in the Ring of Fire area.

There are positive beneficial effects on Gender-Based Analysis Plus sub-groups related to the Extractive Resource Industry as this could create future employment and other infrastructure opportunities for the surrounding Indigenous Communities for the operation of the Community Access Road that will lead to a future Mine.

9.5.7.4.4.2 Mitigation and Enhancement Measures

Mitigation and enhancement measures for the extractive resource industry include engaging with mining claim holders in the road design stage to determine how impacts to any mineral deposits can be minimized and / or how the Project can help to support their activities.

9.5.7.4.4.3 Predicted Residual Effects

Improved access resulting from the Project represents a beneficial effect for the extractive resource industry by facilitating future exploration and development opportunities; however, the realization of these benefits would depend on separate project proposals, regulatory approvals, and market conditions.

Considering the limited spatial extent of overlap, the absence of identified constraints on mineral development, and the increased accessibility to claim areas, adverse residual effects on the Extractive Resource Industry are assessed as not significant.

9.5.7.4.5 Forestry Industry

9.5.7.4.5.1 Potential Effects

Due to the lack of actively harvested forestry lands within the Construction Disturbance Area outside of the Ogoki Forest, the Project will have minimal adverse direct or indirect effects to this valued component. Forestry companies were advised of the Preferred Route in Fall 2024 and Spring 2025 with a request for comments. No comments were received regarding the Preferred Route or comments from review of the Draft Environmental Assessment / Impact Statement.

9.5.7.4.5.2 Mitigation and Enhancement Measures

Please refer to mitigation measures during construction.

9.5.7.4.5.3 Predicted Residual Effects

Adverse residual effects on the Forestry Industry are not expected, as the Construction Disturbance Area overlaps approximately 0.24 percent of the Ogoki Forest, representing a negligible to low magnitude effect relative to the overall forest management unit. Any merchantable timber removed for the Project will be managed and compensated in accordance with applicable Crown forest management requirements.

Given the limited spatial extent of overlap, the short duration of clearing activities, and the capacity of existing forest management and compensation frameworks to address localized timber removal.

9.5.7.4.6 Remote Outfitters

9.5.7.4.6.1 Potential Effects

There are two types of Land Use Permits issued by the Government of Ontario: those for restricted (Type B) outpost camps (in other words, short term seasonal use; limited infrastructure) and Type A commercial outpost camps (in other words, long term use year after year; permanent infrastructure). Though the Construction Disturbance Area does not directly overlap any remote outfitter camps, changes to the land resulting from both construction and operation of the Project may result in less people using these services. There were no restricted (type B) Land Use Permits identified in the Construction Disturbance Area, given that these types of Land Use Permits are set up in the same areas annually, it is not anticipated that these would be impacted. Unless explicitly noted in the Land Use Permit's Standard Conditions, restricted Land Use Permits expire after hunting seasons close for that year. Remote outfitters are then responsible for reapplication. Given that there were none identified, there would be no impact to these types of Land Use Permits.

Changes in environmental conditions, including air quality, noise, visual, surface water, fish abundance / distribution, wildlife abundance distribution, as well as a change in access may cause indirect effects to remote outfitters. Changes related to environmental conditions may change the attractiveness of these camps to their client base. The following describes changes in environmental conditions in the vicinity of the noted camps.

9.5.7.4.6.2 Mitigation and Enhancement Measures

During operations, if the Community Access Road will be considered public, access roads for aggregate areas and other infrastructure required for maintenance activities will be gated to limit public access. Employees will be prohibited from hunting or carrying firearms while working on the Project maintenance.

9.5.7.4.6.3 Predicted Residual Effects

Adverse residual effects are anticipated for remote outfitting operations at Painter Lake, Caviar Lake, and Teabeau Lake as a result of increased access to the area, development of aggregate pits, and Project-related noise, particularly during construction. These effects are associated primarily with changes in access conditions and a localized reduction in wilderness character, which may influence the user experience for clients seeking fly-in, remote outfitting opportunities.

Changes in access may result in increased presence of other land users in the area, which could further influence wilderness character and outfitter client experience. However, these effects are dependent on future access management decisions and user behaviour and are not expected to result in the displacement or closure of outfitting operations.

Effects related to the availability of species harvested for recreational hunting and fishing are not anticipated to be severe. Residual effects on fish and fish habitat were assessed as negligible to medium in magnitude and not significant in the fish and fish habitat valued component. Residual effects on moose and moose habitat were assessed as low to medium in magnitude, ranging from localized to regional in geographic extent, with populations expected to remain self-sustaining and ecologically effective. As such, effects on wildlife and fish availability relevant to outfitting operations are not expected to represent a substantial management concern.

Remote outfitting camps operate under Land Use Permits, which represent a limited tenure on Crown land. While this does not diminish the importance of outfitting operations, it indicates an existing level of exposure to changes in land use conditions. Camp operators will be provided with advance notice of construction activities (minimum one year), allowing for operational planning and adaptation. In addition, improved access may create opportunities for some operators to adjust service models (for example, drive-in or boat-access camps), partially offsetting adverse effects related to remoteness.

Considering the magnitude, duration, geographic extent, reversibility, and the capacity of outfitting operations to adapt, adverse residual effects on the remote outfitters valued component are assessed as not significant.

9.5.7.4.7 Trapping

9.5.7.4.7.1 Potential Effects

The Project footprint (including the road, aggregate pits, construction staging areas, and work camps) overlaps with seven trapline areas: GE138, GE148, GE153, GE154, GE157, GE159, and GE164.

9.5.7.4.7.2 Mitigation and Enhancement Measures

- During operations, if trappers have set up traps close to the corridor, signage will be in place to warn the travelling public and road maintenance staff of set traps in the area; and,
- During operations, if the Community Access Road will be public, access roads for aggregate areas and other infrastructure required for maintenance activities will be gated to limit public access. Employees will be prohibited from hunting or carrying firearms while working on the Project maintenance.

9.5.7.4.7.3 Predicted Residual Effects

The Project Construction Disturbance Area intersects a very small proportion of each affected trapline area (less than 0.5 percent), resulting in a low magnitude adverse residual effect related to direct land occupation. The geographic extent of direct effects is localized to the road corridor, aggregate pits, and associated Project components, with the majority of each trapline remaining available for trapping activities.

Changes to access conditions represent a long-term effect associated with the operational phase of the Project and may influence trapping practices by increasing the presence of other land users along the corridor. While improved access may reduce travel time for trapline holders, it may also increase competition or disturbance in areas adjacent to the road. The magnitude of these access-related effects is assessed as low given the limited width of the corridor and the continued availability of extensive undisturbed areas within each trapline. The extent to which access-related effects materialize is dependent on future access management, enforcement, and user behaviour, introducing a degree of uncertainty in effect prediction.

Noise effects during operations are expected to be intermittent and low in magnitude, occurring primarily during vehicle passage.

Potential effects on furbearer populations relevant to trapping vary by species. Residual effects on American marten and beaver populations are assessed as low in magnitude, with populations expected to remain self-sustaining and ecologically functional. In contrast, residual effects on wolverine were assessed as moderate in magnitude, permanent, and significant in the wildlife valued component due to habitat loss and uncertainty in population response. While wolverine trapping is understood to be limited in the Project area, uncertainty regarding population-level responses introduces a moderate level of risk to trapping opportunities associated with this species.

The combination of localized habitat loss, sensory disturbance, and increased access may contribute to incremental pressure on trapping activities within portions of the affected traplines. However, considering the small proportion of trapline areas directly affected, the localized nature of effects, the continued availability of extensive trapping lands, and the limited current level of commercial trapping activity, the overall magnitude of cumulative adverse effects on trapping is assessed as moderate.

Recognizing the absence of trapper-specific information for several intersected traplines and the uncertainty associated with access-related effects and furbearer population responses, residual effects on trapping are characterized with moderate uncertainty. Continued engagement with trapline holders and follow-up monitoring would assist in refining the understanding of long-term effects.

Taking into account the magnitude, geographic extent, duration, reversibility, and uncertainty of effects, adverse residual effects on the trapping valued component are assessed as not significant at the local and regional scale. Also please refer to the Aboriginal and / or Treaty Rights and Interests Technical Support Document (**Appendix O**) regarding the impact of the Project on trapping in relation to Aboriginal rights.

9.5.7.4.8 Energy and Linear Infrastructure

9.5.7.4.8.1 Potential Effects

At the time of writing this Report, there are no existing energy or linear infrastructure facilities or projects in development in the Construction Disturbance Area.

The Project will not result in the direct removal, relocation, or modification of existing energy or linear infrastructure. However, during operations, the establishment of a permanent road corridor may create increased opportunity for future energy and linear infrastructure development by improving access to a previously remote area. In Ontario, linear infrastructure such as transmission lines commonly follows existing transportation corridors for construction, access, and maintenance efficiency.

9.5.7.4.8.2 Mitigation and Enhancement Measures

No project-specific mitigation measures are required for this valued component, as the Project does not directly involve the construction or modification of energy or linear infrastructure.

9.5.7.4.8.3 Predicted Residual Effects

The Project will not result in adverse residual effects on existing energy or linear infrastructure, as none currently occur within the Construction Disturbance Area. The establishment of the Community Access Road may create a long-term, indirect beneficial effect by increasing access and opportunity for future energy and linear infrastructure development.

9.5.7.5 Summary of Residual Effects

Table 9.5-37 provides a summary of the potential effects for land and resource use, mitigation measures, and residual effects. Detailed information is included in **Appendix U**.

Table 9.5-37: Summary of Residual Effects for Land and Resource Use and Characterization

Valued Component	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Land Use Compatibility**	• Construction	• Due to the absence of land use planning policies for the Construction Disturbance Area and given the Marten Falls First Nation Draft Community-Based Draft Community-Based Land Use Plan is not in place, no adverse effects to this valued component are expected. • There are no indirect effects identified for this valued component for Construction. • There are no anticipated effects on Gender-Based Analysis Plus sub-groups related to Land Use Compatibility during construction or Operations of the Community Access Road.	• It is understood that Marten Falls First Nation will continue to work through the Draft Community-Based Land Use Plan to identify Dedicated Protected Areas. It is anticipated that some of the lands adjacent to the Project will be included as part of the Dedicated Protected Area to control development. The Dedicated Protected Area provides protection of watercourses, areas of significance, and other values including remote tourism camps, canoe routes, and trap cabins. • Lands for the proposed route require to be withdrawn from mining rights to secure the development of the road. • It is recommended that Marten Falls First Nation, the owner of the road and the province be involved in land and resource use planning activities to manage new development that may occur as a result of the Project. Marten Falls First Nation will also continue to update their Draft Community-Based Land Use Plan as necessary. • Aroland First Nation may advise on additional measures related to this valued component which is subject to ongoing engagement with them.	• No predicted residual effect. The Project is following land use intent and management direction with existing *Public Lands Act* and *Far North Act* requirements. Through discussion with Ontario Parks, it is understood that the crossing of the Albany River Provincial Park may require an amendment to the Park management plan which Ontario Parks will oversee if deemed required.	• Not Applicable
• **Land Use Compatibility**	• Operations	• The owner would be responsible for the continued operation and maintenance of the Community Access Road. The jurisdiction of the road would fall under the Public Transportation and Highway Improvement Act.	• All maintenance and operation works performed on the Community Access Road must follow provincial standards and specifications for road and water crossing rehabilitation. • All maintenance and operation works must also comply with all environmental legislation.	• Residual effects from operations to continue throughout the lifespan of the Community Access Road.	• Context: Social • Direction: Positive • Magnitude: Low • Geographic Extent: Local • Duration: Long-term • Frequency: Regular rehabilitation every 5-10 years with minor maintenance required sporadically. • Reversibility: Irreversible • Likelihood: Certain. • Direct / Indirect: Indirect • Significance: Not Significant • Confidence: High • Direct / Indirect: Indirect

Valued Component	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Parks and Protected Areas**	• Construction	• The Project Construction Disturbance Area crosses through the Albany River Provincial Park. The Construction Disturbance Area transects with 5.7 hectares of Park land, which would require vegetation removal during construction. A new bridge would be constructed in the Park to cross the river for 0.6 kilometres. While this will be a direct adverse effect, it represents a very small portion of the Park which is about 0.006 percent of the total area of Albany River Provincial Park of the total size of 95,100 hectares. This effect is considered to be minor in magnitude. • During bridge construction, Albany River Provincial Park may experience up to 70 A-weighted decibels at the bridge crossing location, dropping to 30 A-weighted decibels 5 kilometres away for a minimum of two years. Albany River Provincial Park users may also experience noise from aggregate extraction at pits located on the south side of the Park just west of the proposed crossing location. • Only a very limited amount of the most eastern end of the Ogoki River Park (about 500 metres in) would experience noise effects greater than 45 A-weighted decibels, which is considered to be a noticeable change over existing conditions.	• Refer to mitigations as outlined in the Atmospheric Environment Technical Support Document (**Appendix S**). • Limit clearing and use of land within the Parks as much as possible. Temporary work areas such as staging areas should be located outside of park boundaries. • Monitor and limit the development of any side trails / roads that might extend into the park boundaries. Marten Falls First Nation to discuss with Ontario Parks the need for measures to control access into parks and protected areas where applicable.	• Residual changes from the Construction to the Albany River Provincial Park and Ogoki River Provincial Park.	• Context: Ecological, Social • Direction: Adverse • Magnitude: Low • Geographic Extent: Local and primarily in the vicinity of the river crossing location. • Duration: Short-term • Frequency: Continuous • Reversibility: Reversible • Likelihood: High certainty. • Significance: Not Significant • Confidence: High • Direct / Indirect: Direct
• **Parks and Protected Areas**	• Operations	• Albany River Provincial Park is recognized for its ‘wilderness and remote character’ and is valued for remote backcountry wilderness experiences. The road crossing of the Albany River Provincial Park, a distance of 0.6 kilometres, could contribute to a reduction of the remote character of the Park and impact park user enjoyment levels. The presence of a new bridge across the river would result in a visual impact with the bridge being visible about 900 metres upstream and 700 metres downstream. • There is also potential for some noise and air quality effects on park users from passing vehicles. These effects would be directly related to traffic volume on the road. During the operations phase, users of Albany River Provincial Park may experience >35 A-weighted decibels within 1 kilometres of the bridge location. Noise levels would be higher closer to the bridge crossing location. Baseline noise levels are about 35 to 40 A-weighted decibels and levels over 5 A-	• Refer to mitigations as outlined in the Atmospheric Environment Technical Support Document (**Appendix S**). • Monitor and limit the development of any side trails / roads that might extend into parks. • Continued engagement with Ontario Parks on the progress of the road design and advance notice of construction should be provided to give park users ample notice of proposed construction or maintenance occurring near the parks. • Marten Falls First Nation and the owner of the road to have further discussions with Ontario Parks regarding the Albany River crossing (bridge design), access issues, and user impacts as well as need for updates to the Ogoki and Albany River Provincial Parks. • Any potential access considerations will be explored further through ongoing consultation with Ontario Parks so that future decisions align with park management objectives and protection priorities.	• Residual changes from the Operations to the Albany River Provincial Park and Ogoki River Provincial Park.	• Context: Ecological, Social • Direction: Adverse and potentially positive from new Parks access opportunities. • Magnitude: Low • Geographic Extent: Local • Duration: Long-term • Frequency: Frequent • Reversibility: Yes (for traffic noise). Potential Park access restrictions if put in place would limit or reduce impacts from potentially higher user volumes. • Likelihood: Certain • Significance: Not significant • Confidence: High • Direct / Indirect: Direct

Valued Component	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
		weighted decibels are considered to be noticeable. As noise levels are tied to road use, Park users detecting increased noise would depend on whether a vehicle is traveling along the road when a Park user is in the vicinity of the bridge (for example, travelling down the river by canoe). • Once operational and open to public use, the new road could provide a new access point to the Parks it intersects with. Subject to Ontario Parks support, new access opportunities could be created for the Albany River Provincial Park. This would be beneficial potentially leading to more park users and by providing a new end point or start point for river trips. • While the road does not cross Ogoki River Provincial Park, the road will cross the Ogoki River just to the east of the Park and could also improve access to the river and provide new access to this park (by boat / canoe). Again, this is subject to Ontario Parks support. • As with the Albany River Provincial Park, the improved access from the road might result in more use of the Ogoki River Provincial Park.			
• **Recreation and Tourism**	• Construction	• While limited recreation occurs in the area due to its remote / inaccessible nature, the construction of the Project could result in disruption effects to recreation and tourism activities (for example, disturbances from changes in noise, vibration, air quality, and viewscapes). • The new watercourse crossings could potentially affect navigation (for safety purposes) during construction of the Project. Structures will be designed to permit navigation on waterways deemed to be navigable. • Overall moose health and population abundance is not expected to decrease as a result of habitat loss. • Northern pike, brook trout, walleye, and lake whitefish / burbot populations may all experience effects in the local area, particularly during construction from loss of habitat (bridge construction) and saltation effects. Overall long-term population abundance effects are not expected.	• Design and install proper water crossing structures to accommodate flow, drainage, fish passage, and navigation. • Minimize vegetation clearing to only what is required for construction and staging. • Provide signage along the Preferred Route to inform road users about possible interaction with recreation users, wildlife and restrictions. • The Proponent will discuss possible restrictions for hunting in the Project Area with the Ministry of Natural Resources. • Assess need for parking control along road for safety reasons.	• Residual changs to access to commercial outpost camps, guided fishing and hunting activity along the Albany River.	• Context: Ecological, Social • Direction: Adverse • Magnitude: Low • Geographic Extent: Local • Duration: Long-term • Frequency: Continuous during the construction period • Reversibility: Reversible / irreversible • Likelihood: High certainty • Significance: Not significant • Confidence: High • Direct / Indirect: Direct

Valued Component	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Recreation and Tourism**	• Operations	• The operation of the Project could result in disruption effects to recreation and tourism activities (for example, disturbances from changes in noise, vibration, air quality, and viewscapes). • The future road, which will be approximately 184 kilometres in length, is anticipated to improve access levels to remote crown lands and water resources (assumed that the road would be open to the public during operations). This could provide new recreation and tourism opportunities including: camping, snowmobiling, hunting, fishing, and canoe / kayaking. This would be a beneficial effect of the Project. Note that some of these recreation benefits would not occur if access restrictions to the public (for example, no hunting) are imposed because of law and local Indigenous community concerns. • Though moose health is not expected to be affected and population is not expected to decrease in abundance, there are concerns that with increased access to the area that there could be an increase in illegal hunting / poaching, which could adversely affect moose populations over time. It is also considered that the road could cause wildlife mortality. • Further, from increased access, there could be increased fishing pressure on the waterways in proximity to the road which could also adversely impact species abundance. However, fish populations are expected to be self-sustaining and ecologically effective.	• Design and install proper water crossing structures to accommodate flow, drainage, fish passage and navigation. • Minimize vegetation clearing to only what is required for construction and staging. • Implement progressive reclamation and revegetation of disturbed areas no longer required following construction (laydown areas and construction camps). • Consider provide signage along the Preferred Route to inform road users about possible interaction with recreation users and wildlife. • Consider installation of Crimestoppers signage that discourages poaching and provides the public with a number to call if witnessing poaching or illegal hunting. • Assess need for parking control along right-of-way shoulder for safety reasons. • A cleared width of 60 metres will be maintained, buffer zones of 30 metres will be maintained around waterbodies, and vegetation clearing activities will be limited. • Consider engagement with Ministry of Natural Resources to discuss data collection related to fish through broadscale monitoring or creel surveys to monitor populations.	• Residual changs to access to commercial outpost camps, guided fishing and hunting activity along the Albany River.	• Context: Ecological, Social • Direction: Adverse to positive. • Magnitude: Low to moderate • Geographic Extent: Local • Duration: Long-term • Frequency: Continuous • Reversibility: Reversible, for traffic noise and for access-related impacts through resource road safety requirements and resource management activities (aggregate extraction) activities. • Likelihood: Certain • Significance: Not significant • Confidence: High • Direct / Indirect: Direct
• **Extractive Resource Industry**	• Construction • Operations	• Within the Construction Disturbance Area there are 2,234 hectares of active mining claims, which could be affected by the road and associated Project components. Two mining claim holders will be affected by the development of the road: Wabassi Resources and Canada Chrome Corporation. • It is noted that an aggregate pit is located on the site of an existing Wabassi exploration camp. It is not known how long this exploration camp is to operate. Further consultation are required with Wabassi to better understand this camp and potential impacts to it as a result of the Project. • The development of the road could have an indirect effect of improving access to mineral resource areas and facilitate the development of mines that would provide jobs and economic benefit to the region and local communities.	• Mining companies have indicated their support of the Project due to the increased accessibility that would result to the existing mining claims. • Mitigation and enhancement measures for the extractive resource industry include engaging with mine claim holders in the road detail design stage to determine how impacts to any mineral deposits can be minimized and / or how the Project can help to support their activities. • The owner of the road will consider future mining equipment vehicles use of the road in order to design and maintain to a specific standard to accommodate heavy machinery or excessive number of vehicles.	• Residual effects to access for mining camps and mining claim holders.	• Context: Ecological, Social • Direction: Positive • Magnitude: Moderate • Geographic Extent: Local / Regional • Duration: Long-term • Frequency: Continuous • Reversibility: Reversible • Likelihood: Moderate • Significance: Not significant • Confidence: High • Direct / Indirect: Direct

Valued Component	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Forestry Industry**	• Construction • Operations	• The Ogoki Forest is approximately 1,087,986 974,100 hectares in size. The Construction Disturbance Area intersects 4,700.2384.4 hectares of the Ogoki Forest (bog, forest, marsh, swamp, water, rock, fen, and anthropogenic). Of that, 2,311.7195.4 hectares of forest (coniferous, deciduous, early successional / sparse treed, and mixed) would be removed. At the time of writing, the Ogoki Forest is not actively harvested nor are we aware of any plans for harvesting. There is the potential for direct effects on the Ogoki Forest via removal of commercial forestry land, however, given the percentage of total area of the area affected (0.24 percent of the total area of the Ogoki Forest) this effect is expected to be negligible. There are anticipated harvesting activities as part of the Forest Management Plan (2020-2030). Continuous engagement with the Sustain Forest Licence holder is suggested to determine future harvesting activities that are occurring in the Construction Disturbance Area. • Upgrades to the Painter Lake Road through this Project will assist in harvesting activities that occur from secondary and tertiary forestry roads in this area.	• Should any merchantable forest trees be felled within the Ogoki Forest Management area for Construction, the value of the timber will be determined. • Should any merchantable timber be felled within the Ogoki Forest Management area for the construction of the Project, the value of the timber will be determined. • Review of the Ogoki Annual Work Schedule for harvesting and silvicultural operations should continue throughout detail design if trees are required to be harvested for the construction of the road. • Continued consultation with the Forestry Company regarding road upgrades or planned construction should occur to not disrupt harvesting or silvicultural activities	• Residual changes to Ogoki • Adverse residual effects are not expected as the Construction Disturbance Area overlaps only 0.24 percent of the Ogoki Forest and should any merchantable timber be removed for the Project, applicable compensation will be provided for the loss of those trees.	• Context: Ecological • Direction: Adverse • Magnitude: Low • Geography Extent: Local • Duration: Long-term • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Certain • Significance: Not significant • Confidence: High • Direct / Indirect: Direct
• **Remote Outfitters**	• Construction	• Painter Lake commercial outpost camps and the Caviar Lake commercial outpost camp are likely to experience the highest impact from noise during construction. • Painter Lake and Caviar Lake are likely to experience the highest visual impact during construction. • Northern pike, brook trout, and walleye may all experience effects, particularly during construction from loss of habitat (bridge construction) and sedimentation saltation effects. Fish populations are expected to be self-sustaining and ecologically effective. • Moose health is not expected to be affected and population is not expected to decrease in abundance as a result of project development. If moose populations do change through monitoring by the Ministry of Natural Resources, tag allocations to outfitters could be impacted.	• Engage further with the impacted outfitters / camp owners. A letter was sent in Fall 2024 to known trappers via the Ministry of Natural Resources to advise them of the Preferred Route. Mitigation measures will be updated should input be received by trappers. • Provide at least one year notice to the remote outfitters in advance of construction start. • Implement mitigation measures for air quality, noise, visual, surface water, fish, wildlife, and ungulates as outlined in the appropriate technical support documents. • The possession and use of firearms will not be permitted for construction personnel. • Restrict public access to the Community Access Road corridor during construction. Gate temporary access roads and block and restore as soon as possible after they are no longer needed. Permanent access roads used for maintenance activities will be gated while not in use. • Develop and implement an Environmental Protection Plan that includes the following measures to control,	• The Project is located in an area that has a number of remote outfitter commercial outpost camps on sites that are permitted through Land Use Permits from the Ministry of Natural Resources. Two camps would be directly impacted.	• Context: Social • Direction: Adverse • Magnitude: Medium • Geographic Extent: Local • Duration: Long-term • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Certain • Significance: Not significant • Confidence: Low • Direct / Indirect: Direct

Valued Component	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
			and / or restrict public use of access roads during construction: speed limits, signage, reduced road standard, felling of timber across temporary access roads after reclaimed, removal of temporary watercourse crossings, reduce traffic by locating camps near construction sites. Posting of restricted access and speed signage will follow the Construction Specification for Temporary Traffic Control Devices (Construction Specification for Temporary Traffic Control Devices, 2016).		
• **Remote Outfitters**	• Operations	• Painter Lake camps and the Caviar Lake camp are likely to experience the highest impact from noise during construction and operation phases; however, noise levels are below or equal to the Health Canada Limit Guide of 55 A-weighted decibels. • Due to increased access to the area and to the commercial outpost camps, there could be increased fishing pressure on the waterways in proximity to the road which could also adversely impact species abundance. However, fish populations are expected to be self-sustaining and ecologically effective. • Though moose health is not expected to be affected and population is not expected to decrease in abundance because of the Project, there are concerns that with increased access to the area resulting from the construction and ongoing operations of the road that there could be an increase in illegal hunting / poaching and vehicle-wildlife collisions, which could adversely affect moose populations over time, adversely affecting remote outfitters number of tags if the Ministry of Natural Resources deems these impacts through Moose Aerial Inventory and hunter surveys. • Considering the construction of the Project is expected to contribute to a change in the remote / wilderness character of the area where some of the commercial outpost camps are located and could reduce their attractiveness to clients. The commercial outpost camps at most risk to this include: Painter Lake, due to a proposed aggregate pit on the north side of the lake; Caviar Lake, due to the crossing of the Albany River just to the east of the camp location (<1 kilometres and proposed pits to the south); and to a lesser extent Teabeau Lake, due to improved access to the Albany River and the potential for more boats / fishing in the area of that	• During operations, this assessment has been assumed that the Community Access Road will be accessible to the public but access roads for aggregate areas and other infrastructure required for maintenance activities will be gated to limit public access. Road maintenance staff will be prohibited from hunting or carrying firearms while working on the Project maintenance. • Consider provide signage along the Preferred Route to inform road users about possible interaction with recreation users and wildlife. • Consider installation of Crimestoppers signage that discourages poaching and provides the public with a number to call if witnessing poaching or illegal hunting. • Consider monitoring for vehicle-wildlife collisions and provide annual reports to the Ministry of Natural Resources to analyze impacts to populations due to vehicular collisions.	• The Project is located in an area that has a number of remote outfitter commercial outpost camps on sites that are permitted through Land Use Permits from the Ministry of Natural Resources. Two camps would be directly impacted.	• Context: Social • Direction: Adverse • Magnitude: Medium • Geographic Extent: Local • Duration: Life of the Project. • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Uncertain • Significance: Not significant • Confidence: Low • Direct / Indirect: Indirect

Valued Component	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
		camp. Because of the assumed public access changes, and potential noise impacts, these commercial outpost camps may become less attractive, and the remote outfitters may decide to sell their shares the structures on their Land Use Permit. This is considered to be a direct adverse effect to these business owners. Given new access opportunities to the Caviar Lake and Teabeau Lake commercial outpost camps (potentially accessible by boat via the Community Access Road) it may be possible to repurpose these commercial outpost camps as an option for boating in and be more economical for use.			
• **Trapping**	• Construction	• The Construction Disturbance Area intersects with seven traplines: – GE 138: 148.6 hectares – GE 148: 507.7 hectares – GE 153: 1,036.1 hectares – GE 154: 630.4 hectares – GE 157: 1,921.3 hectares – GE 159: 203.8 hectares – GE 164: 252.3 hectares • All seven traplines intersecting the Construction Disturbance Area will experience short-term noise effects at infrequent levels during construction and operations. • Given the little response from consultation with trappers, it may be justifiable to use Indigenous Knowledge locations of the traplines and trap locations in order to provide options for notification of future construction and disturbance expected in that area.	• Mitigation measures include providing notice to trapline holders of timeline and periods of construction and permitting access to Construction Disturbance Area as required for trapping activities throughout construction. • Signage placed on known areas of trapping access points will notify trappers of future construction activities. • Refer to mitigation measures for noise and wildlife outlined in the appropriate technical support documents. • The possession and use of firearms will not be permitted for construction personnel. • Access to the Community Access Road corridor will be restricted during construction to workers. • Temporary access roads and other temporary construction infrastructure will be reclaimed as quickly as possible following construction. • Beaver lodges will be marked as sensitive sites and protected. • Consider continued engagement with trappers throughout detail design phase. • An Environmental Protection Plan will be implemented that includes the following measures to control, and / or restrict public use of access roads during construction and operation: speed limits, gates / manned gates, signage, reduced road standard, felling of timber across temporary access roads after reclaimed, removal of temporary watercourse crossings, reduce traffic by locating camps near construction sites. Posting of restricted access and speed signage will follow the Construction Specification for Temporary Traffic Control Devices (Construction Specification for Temporary Traffic Control Devices, 2016).	• The Construction Disturbance Area intersects with seven traplines. Indigenous Knowledge provided by Marten Falls First Nation and Aroland First Nation indicates that the route passes through lands that have been used for trapping in the past but that very little trapping activity has occurred in the area in the last ten years due to continued low prices for furs. Continued engagement with trappers may provide additional information as detail design phase progresses.	• Context: Social • Direction: Neutral to Adverse • Magnitude: Low • Geographic Extent: Local • Duration: Long-term • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Moderate certainty • Significance: Not significant • Confidence: Moderate • Direct / Indirect: Direct

Valued Component	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Trapping**	• Operations	• Increased mortality of furbearers from road traffic is possible. Increased human presence and road traffic noise could reduce furbearer populations in the immediate vicinity of the Project. Changes to regional populations are not predicted. It is also not possible to predict the impact of increased access to the area might have on the populations of these species. • Road is expected to improve access to the area for trapping and to allow additional methods of transporting furs to market.	• During operations, the Community Access Road will be accessible to the public but access roads for aggregate areas and other infrastructure required for maintenance activities will be gated to limit public access. Employees will be prohibited from hunting or carrying firearms while working on the Project maintenance.	• The Construction Disturbance Area intersects with seven traplines. Indigenous Knowledge provided by Marten Falls First Nation and Aroland First Nation indicates that the route passes through lands that have been used for trapping in the past but that very little trapping activity has occurred in the area in the last ten years due to continued low prices for furs. Continued engagement with trappers may provide additional information as detail design phase progresses.	• Context: Social • Direction: Neutral and positive • Magnitude: Low • Geographic Extent: Local • Duration: Long-term • Frequency: Continuous • Reversibility: Irreversible • Likelihood: Uncertain • Significance: Not significant • Confidence: Low • Direct / Indirect: Direct
• **Energy and Linear Infrastructure**	• Operations	• Introduction of the right-of-way corridor for the Community Access Road will introduce the possibility of energy and linear infrastructure projects. The Project is expected to have indirect positive impacts to this valued component.	• Any potential projects must undergo their own Environmental Assessment / Impact Assessment process to determine impacts and mitigation and enhancement measures.	• No residual effects	• Not applicable

9.5.8 Visual Environment

9.5.8.1 Project-Environment Interactions

For the Visual Environment, all Project activities are considered to have the potential to interact with, and thereby alter, visual conditions to some degree. This reflects the inherently perceptual nature of the discipline; where any visible physical change, even temporary, contributes to the alteration of landscape character or scenic quality. These activities include both construction-related activities (such as right-of-way clearing, aggregate extraction, bridge and culvert installation, and staging area development) and operations activities (such as ongoing road use, vegetation management, and infrastructure upkeep). **Table 9.5-8** shows the Project-environment interaction for the visual environment valued components.

Table 9.5-38: Project – Environment Interactions – Visual Environment

Community Access Road Phase	Community Access Road Activities	Valued Component	Indicator(s)	Description of Project-Environment Interaction
• **Construction** • **Operation**	• All Project Activities	• Cultural Heritage resources and Indigenous Experience and Sense of Place	• Views from culturally significant sites; traditional use corridors and waterways; harvesting, ceremony, and gathering places; including any area or location identified as integral to Indigenous experience and sense of place.	• Visual change at or near culturally significant sites; traditional use corridors and waterways; harvesting, ceremony, and gathering places; including any area or location identified as integral to Indigenous experience and sense of place.
• **Construction** • **Operation**	• All Project Activities	• Recreation and Tourism	• Views from designated trails and lookouts; canoe routes / portages and backcountry campsites; tourism lodges / outfitters and popular scenic viewpoints	• Visual change at or near designated trails and lookouts; canoe routes / portages and backcountry campsites; tourism lodges / outfitters and popular scenic viewpoints
• **Construction** • **Operation**	• All Project Activities	• Parks and Protected Areas	• Park landscape character and park views (for example, waterway corridors, designated lookouts, remoteness and wilderness character) as protected aesthetic resources in their own right	• Changes to Park landscape character and views
• **Construction** • **Operation**	• All Project Activities	• Permanent Settlements	• Views from residences, community facilities (for example, schools, health centres), public spaces and main streets, and approach roads within settlement areas.	• Changes to views from residences, community facilities (for example, schools, health centres), public spaces and main streets, and approach roads within settlement areas.

9.5.8.2 Discipline-Specific Characteristics

In support of the residual effects characteristics described in **Section 6.7.3**, **Table 6-1**, the following visual definitions apply to the effects assessment.

Ecological and Social Context

The Visual Environment is closely tied to cultural identity, sense of place, well-being, and lived experience for Indigenous Peoples, as well as to wilderness expectations for recreation users and park visitors. Indigenous Knowledge identified rivers, travel corridors, harvesting areas, and culturally important landscapes as places where visual integrity, and remoteness are highly valued. Even limited or localized visual change in these areas can be perceived as meaningful due to the pristine nature of the existing visual conditions.

The Project is situated in a largely intact boreal and wetland landscape with minimal existing infrastructure. Vegetation cover limits views in most areas, while major river corridors create open viewsheds that are visually prominent and sensitive to change.

Overall, all receptors and intrinsic park landscapes were conservatively classified as high sensitivity to visual change.

Magnitude

For magnitude, discipline-specific definitions are required and are provided **Table 9.5-39.**

Table 9.5-39: Visual Environment Magnitude Definitions

Magnitude Levels	Definition
• **Negligible**	• Visibility; Very minor alteration to one or more key elements, features, or characteristics of the existing condition. • Contrast; New elements blend such that the scene appears essentially unchanged. • Frequency / Exposure; Affected view is seen on very rare occasion (less than once a year) or not seen at all
• **Low**	• Visibility; Very minor alteration to one or more key elements, features, or characteristics of the existing condition. • Contrast; New elements are noticeable but generally compatible with landscape character. • Frequency / Exposure; Affected view is seen infrequently (once or twice per year)

Magnitude Levels	Definition
• **Medium**	• Visibility: Partial alteration to one or more key elements / features / characteristics of the existing condition. • Contrast: New elements are noticeable, but generally incompatible with the landscape character, but the change does not dominate the view. • Frequency / Exposure; Affected view is seen occasionally (transient views or travel corridors, or areas used several times per year).
• **High**	• Visibility: Total loss of or major alteration to key elements / features / characteristics of the existing conditions. • Contrast: Introduction of elements considered to be totally uncharacteristic when set within the attributes of the receiving landscape. • Frequency / Exposure: Affected view is seen on a regular basis. Usually for permanent residents or daily exposure.

9.5.8.3 Residual Effects – Construction Phase

9.5.8.3.1 Changes to Visual Environment

9.5.8.3.1.1 Potential Effects

Visual conditions can be expected to change, on occasion, due to construction activities associated with the Project. Visual change will be temporary in nature for construction-related elements (for example, equipment, temporary works, exposed soils) and generally localized within the Construction Disturbance Area, with effects extending into the Local Study Area where visibility is available (for example, open-water river corridors, open fen / peatland). The degree of visual change will depend primarily on (i) visibility (distance, screening, viewing angle, lighting conditions), (ii) contrast (colour / texture / line against sky, water, peatland vegetation, or forest backdrop), and (iii) frequency of exposure (presence and use patterns of Indigenous land users, recreationists, park users, and residents).

During construction, direct visual effects are expected at and near active work areas, particularly at major water crossings and staging locations. Temporary works (for example, bank grading, cofferdams where required, temporary platforms, safety fencing), cleared approaches, equipment movement, and exposed soils may be visible from water and shore. Visibility is typically highest in near- to mid-distance views along the Albany River and Ogoki River corridors, where strong contrast can occur when equipment and disturbed soils appear against reflective water and open sky. Viewer exposure for travel along these corridors is expected to be infrequent to occasional during active construction seasons, depending on seasonal use patterns.

At smaller watercourses and wetlands, short enclosed views in forest settings limit the visible extent of change; visibility is generally low-to-medium and contrast is typically

modest due to vegetative screening. In forested uplands, visibility is generally confined to the Construction Disturbance Area and immediate edges, with contrast driven by exposed mineral soils, stumps, and slash until progressive reclamation is implemented. In open fen and peatland settings, linear clearing may be perceptible at distance under certain lighting conditions due to tonal contrast between mineral surfaces and peatland vegetation.

Indirect visual effects during construction may include short-term dust deposition that lightens foliage near active works (increasing local contrast, particularly along haul routes) and minor early-stage edge effects (for example, localized windthrow or dieback) that may subtly widen sightlines until edges stabilize.

Construction effects to the visual environment are predicted to range from low to medium in magnitude depending on setting and receptor, with the highest magnitude localized at major crossing viewsheds (Albany River and Ogoki River) and within protected park viewscapes

9.5.8.3.1.2 Mitigation and Enhancement Measures

As visual effects are strongly influenced by design and execution details, the Project will implement the mitigation and enhancement measures to reduce visibility, reduce contrast, limit exposure where feasible. Measures include:

- Structure finishes (for example, matte or weathering finishes; non-glare details; avoidance of bright / specular surfaces) to reduce contrast against sky and water;
- Opening and edge form controls (for example, minimized clearing at shorelines; feathered edges; retained clumps / shrub screens; meandering limits where feasible);
- Shoreline shaping and materials (for example, naturalized grading; local rock; coarse woody debris for texture; rapid stabilization / planting);
- Construction lighting controls (for example, prohibition of floodlighting; downward-facing, fully shielded task lighting only; limits on dark-hours activity);
- Staging / stockpile placement outside principal view cones and with height controls where feasible;
- Seasonal scheduling windows for visually intrusive activities where feasible, coordinated with Indigenous communities, outfitters, and Ontario Parks;
- Dust and surface management (for example, suppressant application; prompt stabilization of exposed soils; stockpile controls); and
- Progressive reclamation (for example, salvage / respread organics; native seeding or regeneration; decommission temporary access; restoration of topography).

These measures are intended to reduce peak construction-period contrast and clutter, shorten the duration of visually prominent conditions, preserve dark-sky character, and maintain naturalized shoreline and corridor form—particularly within the Albany River Provincial Park and Ogoki River Provincial Park viewscapes and along culturally important river corridors.

9.5.8.3.1.3 Predicted Residual Effects

Visual change during construction may result in a potential residual effect because it is predicted that, after the implementation of mitigation and enhancement measures, noticeable visual change will still occur in localized settings (particularly at major crossings and within protected park landscapes) during active construction.

Residual construction effects are predicted to be not significant, with the primary rationale being that construction effects are temporary, localized to crossing viewsheds and work fronts, reversible for temporary works, and intermittently experienced by most receptor groups.

9.5.8.4 Residual Effects – Operations Phase

9.5.8.4.1 Changes to Visual Environment

9.5.8.4.1.1 Potential Effects

Visual conditions can be expected to change during operations due to the presence of permanent Project elements (for example, bridge structures, maintained corridor opening, and associated cleared edges) and intermittent operational activity (for example, vehicle visibility and headlight beams). Visual change during operations is expected to be long-term and localized to areas where the Project is visible, particularly at the Albany River and Ogoki River crossings and within park landscapes. The magnitude of visual change will vary based on distance and screening, landscape context, receptor use patterns, and the extent to which finishes, edge form, and vegetation management maintain visual compatibility with the surrounding natural character.

During operations, bridge structures at the Albany River and Ogoki River will be present in views along the river corridors. Visibility is high within near and mid-distance views from water and shore immediately around the crossings; contrast depends on final finish, profile, and backdrop conditions. Viewer exposure is expected to be occasional for most paddlers and shoreline users (in other words, typically encountered once per trip), while the structures remain continuously present in the landscape.

Smaller crossing structures are less visually prominent due to scale and enclosure and are typically experienced as short glimpses. In forested segments, the corridor is

generally screened; in northern fen / peatland settings, the corridor may appear as a subtle linear opening under specific light and distance conditions, with low-to-medium visibility and low contrast once surfaces weather and vegetation regrows along edges.

Indirect effects during Operations may include the ongoing influence of vegetation management in maintaining a visible opening, the potential for localized edge effects (for example, minor windthrow or dieback), and seasonal features such as winter snow windrows that can read as bright linear elements until melt. Under night conditions, where no continuous lighting is assumed, visibility related to operations is expected to be intermittent (for example, headlight beams near open-water crossings or community approach segments).

9.5.8.4.1.2 Mitigation and Enhancement Measures

Mitigation and enhancement measures relevant to Operations include: maintaining feathered edges and buffers through selective trimming where feasible, retaining shrubs for low-view screening, avoiding continuous lighting, and implementing community-specific screening where field validation identifies direct headlight lines of sight. Measures relating to finishes and edge form (co-developed with Indigenous knowledge holders and community members during detail design) are intended to confirm permanent elements remain visually subordinate and compatible with protected river corridor and park landscape character.

9.5.8.4.1.3 Predicted Residual Effects

Visual change during operations may result in a potential residual effect because it is predicted that, after the implementation of mitigation and enhancement measures, permanent structures and maintained corridor openings will remain visible in localized viewsheds (particularly at major crossings and within protected parks) and intermittent operational visibility (vehicles / headlights) may occur near certain receptor locations.

Residual operational effects are predicted to be not significant, with the primary rationale being that post-mitigation effects are generally low in magnitude at the broader viewshed / landscape scale, with medium-magnitude effects limited to very close-range conditions at crossing viewpoints. Exposure for most receptors is occasional and spatially constrained, and overall park-scale and landscape-level visual character is expected to remain intact.

9.5.8.5 Summary of Residual Effects

Table 9.5-40 provides a summary of the potential effects for visual environment, mitigation measures, and residual effects. Detailed information is included in **Appendix V**.

Table 9.5-40: Summary of Residual Effects – Visual Environment

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Visual Environment (Cultural Heritage Resources and Indigenous Experience and Sense of Place; river corridor viewscapes and broader visual network)**	• Clearing, grading, earth moving, grubbing of vegetation, and stockpiling of materials along the right-of-way and other access and construction areas, and construction of infrastructure (for example, access roads, bridges, temporary laydown areas, turn-around areas, and temporary construction camps) • Temporary works at water crossings (for example, bank grading, cofferdams where required, temporary works platforms, safety fencing) • Staging areas and haul routes • Reclamation and decommissioning of temporary access roads, temporary laydown areas, staging areas and construction camps	• Construction	• Construction activities may result in temporary changes to visual character and views due to the presence of equipment, temporary works, cleared approaches, exposed mineral soils, and short-term dust deposition. • Effects are most noticeable at Albany River and Ogoki River crossing viewscapes (high visibility from water and shore; potential strong contrast against reflective water and sky), and in open fen / peatland segments where linear clearing can be perceptible at distance under specific light conditions.	• Use matte or weathering finishes for steel; consider colour or texture for exposed concrete; non-glare fasteners; avoid bright, specular surfaces. • Stake meandering clearing limits; keep visible openings at shorelines to the smallest practicable width; feather edges with retained clumps and shrub screens where possible. • Shape abutments and approach embankments to follow adjacent slopes where possible; use local rock; place coarse woody debris to restore texture; implement rapid stabilization and planting within the same season where possible. • Prohibit floodlighting; allow downward-facing, fully shielded task lights only; enforce dark-hours. • Site temporary staging, batch plants, and stockpiles behind landforms or retained vegetation where possible; cap material or equipment stack heights below the treeline where feasible. • Schedule visually intensive tasks outside peak paddling and cultural use periods identified with communities and outfitters where feasible. • Apply water or equivalent suppressant; cover or stabilize stockpiles; promptly stabilize exposed soils; clean hard surfaces at staging areas. • Salvage and respread organics; seed with native species or allow natural l regeneration; decommission temporary access; restore topography (progressive reclamation) • Co-develop finish palette, edge form, and opening limits with Indigenous knowledge holders and community members, including site walks and field reviews before final clearing. • Provide clear advance notices for intrusively visible works; maintain one or more quiet, dark vantage spaces away from bridge view for elders and youth during key seasons.	• Residual changes to river corridor and broader Indigenous visual network	• Context: Highly valued visual corridors that provide both cultural heritage resource value and provide sense of place • Direction: Negative • Magnitude: Medium at and near Albany River and Ogoki River crossings; Low to negligible elsewhere (post-mitigation) • Geographic Extent: Localized to crossing viewscapes and Construction Disturbance Area; may extend into portions of the Local Study Area where visibility exists • Duration: Short- to medium-term • Frequency: Occasional to frequent during active construction seasons in river corridors; otherwise infrequent • Reversibility: Partially Reversible for temporary works and construction-related visual clutter • Probability: Certain • Significance: Not significant • Uncertainty: Low–Moderate to Moderate (varies by setting) • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Visual Environment (Recreation and Tourism; backcountry user experience and scenic integrity)**	• Same as above (construction clearing and infrastructure development; temporary works at crossings; staging and haul routes; reclamation / decommissioning)	• Construction	• Construction activities may result in temporary visual disturbance in near- to mid-distance views for backcountry canoeing / camping / angling / hunting users, particularly at water crossings and staging areas. • Elsewhere, effects are brief and screened in forested segments; short-term dust and localized turbidity may reduce perceived naturalness near active works.	• Opening and edge form controls (minimize shoreline opening; feather edges; retain shrubs / clumps). • Staging outside view cones; height controls below treeline where feasible. • Dust and surface management. • Progressive reclamation (rapid stabilization; organics respread; regeneration • Seasonal windows to avoid peak paddling and cultural use periods where feasible. • Construction communications and advance notices for intrusively visible works.	• Residual changes to remote backcountry setting	• Context: Recreation and Tourism • Direction: Negative • Magnitude: Medium at crossing viewscapes; Low elsewhere • Geographic Extent: Localized (crossings and Construction Disturbance Area) • Duration: Short- to medium-term • Frequency: Occasional (intermittent user exposure; seasonal) • Reversibility: Reversible for temporary works • Probability: Certain • Significance: Not significant • Uncertainty: Low–Moderate • Direct / Indirect: Direct
• **Visual Environment (Parks and Protected Areas; protected landscape character within Albany River Provincial Park and Ogoki River Provincial Park)**	• Clearing and construction within regulated park boundaries where applicable • Temporary works at water crossings and approaches • Construction lighting, staging, and shoreline grading • Reclamation of temporary works areas	• Construction	• Construction activities may result in temporary visual intrusions within protected viewscapes (cleared approaches, equipment, temporary works). • Construction lighting may affect night sky viewing and nighttime wilderness character if not controlled. • Short-term dust/turbidity may reduce scenic integrity near active works.	• Lighting controls (no floodlighting; shielded downward task lighting only; dark-hours). • Staging / stockpiles outside view cones; treeline height controls. • Shoreline shaping and naturalized grading; local rock; coarse woody debris for texture; rapid stabilization/planting. • Minimize shoreline clearing and feather edges. • Seasonal windows where feasible. • Communication / advance notice. • Design and construction to be demonstrably consistent with Waterway-class objectives and applicable management statements / Ontario Parks authorization requirements (as applicable).	• Residual changes to protected aesthetic resources and wilderness character	• Context: Parks and Protected Areas • Direction: Negative • Magnitude: Low-to-medium • Geographic Extent: Local (Construction Disturbance Area within parks and immediate crossing viewscapes) • Duration: Short- to medium-term • Frequency: Continuous within the park landscapes while works are present; intermittent for individual visitors • Reversibility: Reversible for temporary works • Probability: Certain • Significance: Not significant • Uncertainty: Low • Direct / Indirect: Indirect

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Visual Environment (Permanent Settlements; Marten Falls community outward views and Albany River shoreline cabins)**	• Construction works near community approach (clearing, grading, equipment movement) • Temporary lighting and haul traffic • Dust generation along routes	• Construction	• Construction activities may result in temporary changes to views and nighttime character near the community approach due to equipment visibility, intermittent lighting, movement, and dust. • At shoreline cabins, low-to-medium visual change may occur when construction is nearby and cabins are in use.	• Construction lighting controls (shielded task lighting; dark-hours; no floodlighting). • Dust control and prompt stabilization of exposed soils. • Staging outside view cones where feasible. • Communication and advance notice for intrusively visible works.	• Residual changes to residential communities with the remote wilderness settings and cabins that are intermittently occupied.	• Context: Permanent Residents • Direction: Negative • Magnitude: Low (community); Low-to-medium when works nearby (cabins) • Geographic Extent: Local (Construction Disturbance Area and portions of LSA where Project is perceptible) • Duration: Short- to medium-term • Frequency: Infrequent to occasional (community); occasional when cabins in use • Reversibility: Reversible for temporary works • Probability: Probable to Certain (depending on proximity/timing of works) • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Direct
• **Visual Environment (Cultural Heritage Resources and Indigenous Experience and Sense of Place; river corridor viewscapes and broader landscape)**	• Operations of the right-of-way and permanent access roads • Presence of permanent bridge structures at Albany River and Ogoki River • Routine vegetation management • Winter maintenance (for example, snow windrows) • Intermittent vehicle visibility and headlight beams (no continuous lighting assumed)	• Operations	• Operations may result in long-term changes to visual character and views due to the presence of permanent bridge structures and maintained corridor opening, with localized medium-magnitude effects in very close-range river crossing views and generally low-magnitude effects in broader viewsheds after mitigation. • Indirect effects may include maintained openings due to vegetation management and seasonal snow windrows; intermittent headlight beams may be perceptible near open-water crossings and the community approach.	• Use matte/weathering finishes; avoid specular surfaces on bridges and visible barriers. • Maintain buffers and feathered edges; selective trimming over broad brushing; retain shrubs for screening. • Do not install continuous road or bridge lighting; task lighting only for incidents/maintenance. • Where validation identifies direct headlight lines of sight near the community approach, install low vegetated berms or dense planting; micro-site within right-of-way where practicable. • Co-develop final finish palette and edge form with Indigenous knowledge holders and community members during detail design.	• Residual changes to high cultural value river corridors and remote wilderness settings.	• Context: Highly valued visual corridors that provide both cultural heritage resource value and provide sense of place • Direction: Negative • Magnitude: Low in most views; Medium at very close range at Albany and Ogoki crossings • Geographic Extent: Localized to crossing viewscapes and visible portions of the corridor within the Local Study Area • Duration: Long-term • Frequency: Occasional (river travel); infrequent elsewhere • Reversibility: Irreversible for permanent structures and maintained corridor opening • Probability: Certain • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Visual Environment (Recreation and Tourism; scenic integrity and backcountry experience)**	• Same as above (permanent bridges, maintained corridor opening, intermittent vehicles/headlights, vegetation management, winter maintenance)	• Operations	• Operations may result in long-term change to scenic integrity at major river crossings due to bridge presence contrasting with expectations of uninterrupted natural shorelines and open-water vistas; smaller crossings and screened forest segments are less prominent. • Nighttime visibility is intermittent (headlights) with no continuous lighting assumed.	• Bridge finish controls (matte/weathering). • Vegetation management to maintain screening and feathered edges. • No continuous lighting.	• Residual changes to backcountry recreation with high expectation of intact natural character.	• Context: backcountry recreation with high expectation of intact natural character. • Direction: Negative • Magnitude: Low in most views; Medium at very close range at crossings • Geographic Extent: Local (crossing viewscapes; limited corridor visibility) • Duration: Long-term • Frequency: Occasional • Reversibility: Irreversible • Probability: Certain • Significance: Not significant • Uncertainty: Low–Moderate • Direct / Indirect: Direct
• **Visual Environment (Parks and Protected Areas; protected landscape character)**	• Permanent bridges and associated clearing within park landscapes • Routine maintenance (vegetation management; winter snow features) • No continuous lighting (assumed)	• Operations	• Operations may result in long-term, localized alteration of protected scenic character due to permanent bridge structures and maintained openings within the park landscapes. • Effects are generally low at the park scale, with localized medium-magnitude effects limited to close-range crossing views.	• Bridge finishes to reduce contrast and glare. • Vegetation management to maintain buffers and screening; selective trimming. • No continuous lighting. • Ongoing alignment with Ontario Parks authorization requirements and applicable management direction (as applicable).	• Residual changes to protected aesthetic resources	• Context: Parks and Protected aesthetic resources • Direction: Negative • Magnitude: Low in most views; Medium at very close range • Geographic Extent: Local (park landscapes near crossings / Construction Disturbance Area) • Duration: Long-term • Frequency: Continuous within park landscapes • Reversibility: Irreversible for structures and maintained opening • Probability: Certain • Significance: Not significant • Uncertainty: Low • Direct / Indirect: Direct

Valued Component	Project Activities	Project Phase	Description of Potential Effect	Mitigation and Enhancement Measures	Predicted Residual Effect	Characterization of Predicted Residual Effect and Determination of Significance
• **Visual Environment (Permanent Settlements; Community and cabins)**	• Vehicle movement and intermittent headlight beams on approach segments • Maintained corridor opening • Vegetation management • No continuous lighting	• Operations	• Operations may result in low-level, intermittent visual presence of vehicles and headlight beams near the community approach and select outward-facing viewpoints depending on micro-siting and vegetation. • At shoreline cabins, operations may result in low-magnitude, intermittently experienced changes where the Project is perceptible.	• No continuous lighting. • Community-specific screening where field validation identifies direct headlight lines of sight (low vegetated berms, dense planting; micro-siting within right-of-way). • Vegetation management to retain screening.	• Residual changes to residential community and remote cabins within a wilderness setting.	• Context: Residential community and remote cabins within a wilderness setting. • Direction: Negative • Magnitude: Low • Geographic Extent: Local (portions of Local Study Area where Project is perceptible) • Duration: Long-term • Frequency: Infrequent to occasional • Reversibility: Irreversible for permanent corridor/structures; intermittent operational visibility • Probability: Certain (where visible) • Significance: Not significant • Uncertainty: Moderate • Direct / Indirect: Direct

9.5.9 Assessment of Significance of People Disciplines

The assessment of significance of residual effects of the Community Access Road is informed by the interaction between the significance factors, with magnitude and geographic extent being the most important factors. Consideration is also given to context, which includes ecological context (in other words, the sensitivity and resilience of the valued components), and social context (in other words, concerns of Indigenous communities, interested agencies, groups and individuals raised during consultation and engagement and through review comments on the Environmental Assessment reports). Implementation of proven mitigation measures is expected to aid in the avoidance or reduction of the magnitude, geographic extent, and / or duration of residual effects.

9.5.9.1 Determination of Significance

Using the overall residual effects characteristics for each discipline, each of the potential residual effects was assigned a significance level as a means of ranking the potential effects on the surface water quantity, surface water quality, and sediment quality. The significance levels are defined as:

- Significant: residual effects were considered to be significant if the majority of the residual effects characteristics were assessed as high in magnitude and long-term or permanent in duration, at any geographic extent, or they represented a management concern; and
- Not Significant: residual effects were considered not significant if they demonstrated any other combination.

9.5.9.2 Aboriginal and Treaty Rights and Interests

An assessment of significance is outlined in each confidential Aboriginal and Treaty Rights and Interests Report.

9.5.9.3 Acoustic Environment

Because the residual effects from the increased noise during construction are not predicted to be long-term in duration or frequent, the residual effects during construction are assessed as not significant.

As the magnitude of the residual effects from the increased noise due to road operations is low, and the residual effects from the increased noise due to quarry use are not predicted to be frequent, the residual effects during operations are assessed as not significant.

Because the residual effects from the increased vibration during construction are not predicted to be long-term in duration or frequent, the residual effects during construction are assessed as not significant.

Because the residual effects from the increased vibration during operations—from quarry blasting—are not predicted to be long-term in duration or frequent, the residual effects during operations are assessed as not significant.

9.5.9.4 Atmospheric Environment

9.5.9.4.1 Air Quality

Residual effects were generally considered as significant if the residual effect was assessed at a high magnitude with potential residual impacts occurring at sensitive receptors, at either a frequent occurrence or in long term duration with irreversible effects. The construction phase is both transient in nature as well as temporary (short term), and the residual effects are considered reversible. Through the significance assessment it was found that no significant residual effects in the context of air quality are anticipated through construction.

It is noted that that select construction activities may result in receptors experiencing air quality levels considered to be high magnitude (in other words, elevated levels of sulphur dioxide from blasting) however, as previously indicated these activities occur infrequently, over a short term duration and are not considered to result in a significant residual effect. This finding was largely driven by the reversibility of air quality effects from construction activity. It should be noted that a maximum number of daily and annual blasts was considered as part of this assessment. In the event that blasting frequency is reduced the frequency of potential effect will also decrease. Residual effects from operations that were classified to have a high magnitude were determined to be significant**.** High magnitude impacts are predicted for the following indicator compounds and their respective averaging periods:

- Particulate matter less than 2.5 micrometres – 24-hour – north-south road segment – 115 metres from road;
- Particulate matter less than 2.5 micrometres – annual – north-south road segment – 134 metres from road;
- Particulate matter less than 10 micrometres – 24-hour – north-south road segment – 1,986 metres from road;
- Particulate matter less than 10 micrometres – 24-hour – community road segment – 10 metres from road;

- Total Suspended Particulate – 24-hour – north-south road segment – 3,004 metres from road;
- Total Suspended Particulate – 24-hour – Community Access Road segment – 119 metres from road; and
- Total Suspended Particulate – annual – north-south road segment – 899 metres from road.

All other indicator compounds were determined to be not significant.

9.5.9.4.2 Greenhouse Gases

Despite the potential implementation of mitigation measures, the road construction and subsequent vehicle traffic on the road will continue to produce greenhouse gases. Although improvement in future emission control technologies for construction mobile equipment and vehicles may reduce total greenhouse gas emissions, the residual emissions from Construction and Operations are unavoidable. When comparing to provincial transportation sector greenhouse gas totals, the magnitude of both Construction and Operations emissions are assessed negligible, and the significance of residual effects is assessed as not significant.

Construction will lead to changes in land uses (for example deforestation) which release carbons stored in vegetation and soil. Although the Community Access Road is planned to use improved construction techniques (for example floating road) to minimize disturbances on wetlands, the residual effects of greenhouse gases from land use changes can not be fully eliminated. The Project's emissions from land use changes are assessed as low magnitude when compared to Ontario's total greenhouse gases and therefore the significance of emissions from land use changes are determined as not significant.

9.5.9.5 Archaeological and Cultural Heritage

An assessment of significance is not required for archaeological and cultural heritage.

9.5.9.5.1 Community Well-Being

Considering the assessment of potential residual effects, including both positive outcomes and adverse impacts, the some of the indicators for community well-being are considered significant.

Key positive effects include improved accessibility to and from Marten Falls First Nation, leading to small increases in on-reserve population, positive effects on productivity and

economic growth, and sustained tax revenues. Year-round access will also reduce the cost of essential goods such as bottled water and building materials, making everyday necessities more affordable. Additionally, improved transportation will create new opportunities for local businesses, employment, and community development, contributing to long-term resilience.

Key residual effects that are significant include mental health and well-being due to loss of connectivity to the land, change in sense of place and identity due to presence of the road; potential increase in substance use due to easier access to drugs and alcohol; reduction in availability of traditional foods due to construction disturbances to traditional food sources; reduction in availability of traditional foods due to overharvesting and environmental strain from the road; quality of traditional foods due to potential contamination; increase in violence and harassment; and environmental effects on air, water, soil due to contaminants, and noise levels may affect human health directly or indirectly.

Ongoing monitoring and adaptive management will support effective management of these effects.

9.5.9.6 Land and Resource Use

Considering the characterization of potential residual effects, residual effects on all valued components – land use compatibility, parks and protected areas, recreation and tourism, extractive resource industry, forestry industry, remote outfitters, trapping and energy and linear infrastructure – are assessed as not significant**.**

9.5.9.6.1 Visual Environment

The assessment shows that residual visual effects of the Project are highly localized and primarily associated with the major water crossings. With the committed mitigation and adaptive follow-up measures in place, no significant adverse residual effects are expected at the scale of the visual environment discipline or for any visual environment valued component.

Visual change is concentrated at discrete locations, while the majority of the route results in low-magnitude and not significant effects. Open-water views at the Ogoki River and Albany River Crossings expose bridge profiles and shoreline openings; however, following mitigation, residual visual magnitude is low in typical approach and mid-distance views. Medium-magnitude visual change is limited to very close-range viewpoints along the river view axis, generally within approximately 250 to 400 metres of the crossings. These localized effects do not alter the broader cultural, recreational, or protected landscape experience and do not result in significant residual effects.

10. Cumulative Effects Assessment

The *Impact Assessment Act* (Government of Canada, 2017a) requires that each Impact Statement of a project take into account any cumulative environmental effects that are likely to result from the project in combination with the environmental effects of other physical activities that have been or will be carried out. Additionally, this Cumulative Effects Assessment has been prepared in accordance with the Terms of Reference Notice of Approval for the Community Access Road.

This section presents the assessment of potential cumulative effects completed as part of the Community Access Road. The effects of past and present activities on the Study Area and valued components identified for the Community Access Road were assessed. A summary of results is provided in the following sections, and more details supporting this Cumulative Effects Assessment can be found in **Appendix F** to **Appendix Y**.

The Cumulative Effects Assessment builds on the results of the effects assessment described in **Section 9** and will consider the incremental changes that are predicted to have a likely residual adverse effect on a valued component.

10.1 Spatial and Temporal Scoping

As noted in **Section 6**, a Project Inclusions List was prepared as part of the Cumulative Effects Assessment to determine physical activities that may have a spatial or temporal overlap with the Community Access Road. The Project Inclusions List includes details regarding infrastructure projects in northern Ontario, where information was publicly available from online sources. **Table 10.1-1** shows the complete Project Inclusions List, and the locations of each project are shown on **Figure 10.1-1**.

A scoping exercise was completed to determine which projects had a spatial or temporal overlap with the Local and Regional Study areas identified for each of the valued components carried forward from the residual effects assessment. The sections below discuss the cumulative effects based on the results of the discipline scoping exercise. A summary of projects included in each discipline assessment, spatial and temporal overlap, and identification if a project or activity is reasonably foreseeable is included in **Table 10.2-4**, **Table 10.3-3**, and **Table 10.4-3**. The complete discipline scoping results for each project activity are included in **Appendix F** to **Appendix Y**.

Table 10.1-1: Project Inclusions List

Project	Identified in Tailored Impact Statement Guidelines (Yes / No)	Location	Status	Distance (kilometres) and Direction from Community Access Road Study Area	Developer / Company	Project Start Date	Project Duration	Project Completion Date	Assumed Temporal Overlap with Community Access Road Activities (Yes / No)	Project Description	Map Feature Type	Map Buffer
Northern Road Link	Yes	Between Community Access Road and Webequie Supply Road, northwestern Ontario	Impact Assessment ongoing	0 (adjacent or overlapping)	Webequie First Nation Marten Falls First Nation	October 28, 2020	Unknown	Unknown	Yes - construction and operation will overlap with Community Access Road construction, as it is expected that Northern Road Link construction will begin during the construction of the northern portion of the Community Access Road	• Marten Falls First Nation and Webequie First Nation are proposing to build, operate and maintain an all-season multi-use road and associated infrastructure between the community access road that has been proposed by Marten Falls First Nation and the supply road that has been proposed by Webequie First Nation. • Terms of Reference for the preparation of an Environmental Assessment approved March 3, 2023.	Line	100 metres
Anaconda and Painter Lake Forestry Access Road Upgrades	Yes	James Bay Lowlands	Unknown	0 (adjacent or overlapping)	In discussions: Ministry of Transportation and Aroland First Nation	Not Started	2 to 5 years	Unknown	Yes - operation is expected to overlap with the Community Access Road construction and operations	• Upgrades to existing road will be required for heavy vehicles accessing the Community Access Road route during construction and operations. • Currently discussions on proponency and scope of work are underway. • Potential scope of work is expected to include roadway widening, culvert and bridge replacements / rehabilitations to accommodate higher weight vehicles, and road base improvements. • This project will be completed prior to the start of the construction of the Community Access Road; therefore, the upgrade to these roads is not expected to overlap with the construction of the Community Access Road.	Line	100 metres
Rapid Lynx Broadband	Yes	Matawa First Nation communities	Phase 1 Complete Phase 2 Ongoing	Phase 1 - 0 (adjacent or overlapping) Phase 2 - 57.7	Rapid Lynx	February 2020	Unknown	Unknown	Yes - operations of Phase 1 and operations and construction of Phase 2 expected to overlap with Community Access Road construction and operations	• Approximately 810 kilometres of fibre-optic cables, providing reliable high-speed internet service to five Matawa First Nation communities: Eabametoong, Marten Falls, Neskantagat, Nibinamik and Webequie with an interconnection at Aroland.	Line	100 metres
Esnagami Road Bypass Upgrade	Yes	Aroland First Nation	Unknown	51.9	In discussions: Municipality of Greenstone, Ministry of Transportation, and Aroland First Nation	Not Started	2 to 5 years	Unknown	Yes - construction expected to overlap with Community Access Road construction	• Upgrades to existing road to use as a bypass route around Aroland First Nation settlement area by heavy vehicles accessing the Community Access Road route towards the Ring of Fire. • Currently discussions on proponency and scope of work are underway. • Potential scope of work is expected to include roadway widening, bridge and culvert rehabilitation / replacement, and road base improvements.	Line	100 metres

Project	Identified in Tailored Impact Statement Guidelines (Yes / No)	Location	Status	Distance (kilometres) and Direction from Community Access Road Study Area	Developer / Company	Project Start Date	Project Duration	Project Completion Date	Assumed Temporal Overlap with Community Access Road Activities (Yes / No)	Project Description	Map Feature Type	Map Buffer
Transload Facility	Yes	Aroland, Ontario	Ongoing	59.5	Wyloo	Unknown	Unknown	Unknown	Yes - construction and operations expected to overlap with Community Access Road construction and operations	• Rail Transload Facility to Aroland First Nation.	Point	2.5 kilometres
Eagle's Nest Project	Yes	James Bay Lowlands	Permitting ongoing	97.8	Wyloo	2023	Approximately 11 years, with possible extension of 9 years	Unknown	Yes - construction expected to overlap with Community Access Road construction Operations expected to overlap with Community Access Road construction and operations	• Multi-metal underground mine located near McFaulds Lake. • Mine will produce and supply nickel, copper, platinum and palladium. • Deposit contains approximately 11 million tonnes of resources and is estimated to have an initial mine life of 11 years with possibility for a 9-year extension. • Terms of Reference for the project approved June 18, 2015.	Polygon	Not applicable
Webequie Supply Road	Yes	McFaulds Lake (eastern limit) Webequie First Nation (western limit)	Impact Assessment ongoing	98.5	Webequie First Nation	August 28, 2019	Unknown	Unknown	Yes - construction and operations will overlap with Community Access Road construction (expected to occur concurrently)	• New all-season road approximately 107 kilometres in length from Webequie First Nation to the mineral deposit near McFaulds Lake for mineral exploration and future mining development activities. • 17 kilometres of the corridor is within Webequie First Nation Reserve Lands.	Line	100 metres
Ogoki and Long Lac Diversions	Yes	Ogoki Lake and Long Lac, Ontario	Operating	95.8 (Ogoki) 87.0 (Long Lac)	Ontario Power Generation	1939 / 1943 respectively	Unknown	Unknown	Yes - operations overlap with Community Access Road construction and operations	• Divert water from a portion of the Hudson Bay watershed into the Lake Superior basin. • Dammed the upper Kenogami River, a tributary of the Albany River, on the north side of Long Lake. • Long Lac diversion inflows approximately 39 cubic metres per second into the Great Lakes Basin. • Ogoki diversion inflows approximately 113 cubic metres per second into the Great Lakes Basin.	Point	2.5 kilometres
Winter Access Road Realignment Project	No	Various	Ongoing	0	Ministry of Northern Economic Development and Growth	2025	Unknown	Unknown	Yes - construction and operations will overlap with Community Access Road construction (expected to occur concurrently)	• Funding to remote northern communities for projects involving installation of water crossing infrastructure, such as pre-engineered bridges and culverts, and repairs to existing structures. • Funding for approximately 3,200 kilometres of winter access roads in Northern Ontario.	Line	100 metres

Project	Identified in Tailored Impact Statement Guidelines (Yes / No)	Location	Status	Distance (kilometres) and Direction from Community Access Road Study Area	Developer / Company	Project Start Date	Project Duration	Project Completion Date	Assumed Temporal Overlap with Community Access Road Activities (Yes / No)	Project Description	Map Feature Type	Map Buffer
Water Control Structures Along the Albany River Watershed	No	Albany River Watershed	Operating	Cedars Channel North Control Dam - 241.6 Cedars Channel South Control Dam - 241.6 Cedars Channel Block Dam - 241.5 Rat Rapids South Control Dam - 241.5 Rat Rapids North Control Dam - 241.5	Ontario Power Generation	Unknown	Unknown	Unknown	Yes - operations expected to overlap with Community Access Road construction	• Series of dams on the Albany River to generate power for newly opened gold mines at Pickle Lake. • Includes the Cedars Channel Dams and Rat Rapids Dams (located at Lake St Joseph).	Point	2.5 kilometres
Seymour Lake Lithium Project	No	Seymour Lake	Ongoing	131.3	Green Technology Metlas	2026	Unknown	Unknown	Yes - operations overlap with Community Access Road construction and operations	• Lithium deposit near Seymour Lake. • First production targeted in 2026.	Polygon	Not applicable
Juno Corporation Mining Exploration Activities	No	375 kilometres North of Longlac, Ontario	Ongoing	159.8	Juno Corp.	2019	Unknown	Unknown	Yes - operations overlap with Community Access Road construction and operations	• Exploration of minerals in the Ring of Fire. • Mineral exploration permit issued in August 2025.	Point	2.5 kilometres
Equinox Gold Greenstone Gold Mine	Yes	Geraldton, Ontario	Construction	112.8	Equinox Gold Corp.	October 2021	36 years	2044	Yes - operations expected to overlap with Community Access Road construction and operations	• Construction, operation, decommissioning and abandonment of an open-pit gold mine and onsite metal mill located near Geraldton, Ontario. • Production estimated at 30,000 tonnes per day. • Amended Decision Statement issued February 10, 2021. • First gold pour is anticipated in early 2024.	Polygon	Not applicable
Victor Mine	Yes	James Bay Lowlands	Closed - Rehabilitation ongoing	172.1	De Beers	2008	Unknown	Mine closed in 2019, ongoing rehabilitation - timing unknown	Yes - rehabilitation expected to overlap with Community Access Road construction	• Fly-in, fly-out open put diamond mine located near James Bay lowlands of northern Ontario. • Mine in operation from 2008 to 2019; however, now closed and in rehabilitation.	Polygon	Not applicable
Realignment of Highway 11 Project	No	Between Pearl Lake and Ouimet	Ongoing	260.7	Ministry of Transportation	2022	Unknown	Unknown	Yes - construction and operation expected to overlap with Community Access Road construction and operations	• Twinning of the existing Highway 11 at the east and west limits. • Rehabilitation and improvement of existing highway lanes. • New alignment for eastbound lanes. • Detail design of the project is ongoing.	Line	100 metres
Upgrades to Highway 11 to the Ring of Fire	No	Geraldton, Ontario	Ongoing	109.7	Indigenous Affairs and First Nations Economic Reconciliation	2025	Unknown	Unknown	Yes - construction and operation expected to overlap with Community Access Road construction and operations	• Connection of Highway 11 to Highway 584 to improve road access between Northern communities and to the provincial highway network. • First segment on the road network to the Ring of Fire.	Line	100 metres

Project	Identified in Tailored Impact Statement Guidelines (Yes / No)	Location	Status	Distance (kilometres) and Direction from Community Access Road Study Area	Developer / Company	Project Start Date	Project Duration	Project Completion Date	Assumed Temporal Overlap with Community Access Road Activities (Yes / No)	Project Description	Map Feature Type	Map Buffer
Gull Bay Roads Rehabilitation	No	Gull Bay First Nation	Impact Assessment Complete	202.6	Gull Bay First Nation	2020	Unknown	Unknown	Yes - construction expected to overlap with Community Access Road construction	• Rehabilitate approximately 10 kilometres of roads in the Gull Bay First Nation in Ontario. • Relocation of the community's entrance and exit to Highway 527; rebuilding the road base and widening certain sections; grading and brush clearing to improve sightlines; addressing drainage issues through ditching and the replacement of an estimated 43 culverts; installing street and traffic control signs (for example street, stop, yield and speed signs plus pedestrian warnings); and resurfacing Main Street and Streets A through M with Granular A along with calcium chloride for dust suppression. • Infrastructure Canada issued its Notice of Determination on July 15, 2021, and determined that the project is not likely to cause significant adverse environmental effects.	Line	100 metres
East-West Tie Transmission Line Project	No	Between Wawa and Thunder Bay, Ontario	Operating	210.1	NextBridge Infrastructure LP	2019	Operations are indefinite	Not applicable	Yes -operations expected to overlap with Community Access Road construction and operations	• 450 kilometres double-circuit 230 kilovolts transmission line connecting the Lakehead Transfer Station to the Wawa Transfer Station, and the Marathon Transformer Station. • Project consists of transmission structures, insulators, conductors, overhead shield wires and optic fibre ground wires and grounding. • Will be operated on an ongoing basis for an indeterminate period of time. Decommissioning of the project is not anticipated at this time. • Construction completed in March 2022.	Line	100 metres
Copper - Generation Mining Ltd. Copper - Palladium Project	Yes	Marathon	Impact Assessment Ongoing	210.5	Generation Mining Ltd.	August 2011	Operation estimated at 12.5 years, decommissioning period unknown	Unknown	Yes - construction expected to overlap with Community Access Road construction Yes - operations expected to overlap with Community Access Road operations	• Construction, operation, and decommission of an open-pit palladium mine approximately 10 kilometres from Marathon, Ontario. • Includes three open pits, an ore processing plant, tailings and mine rock storage facilities, site access roads, transmission line, explosives factory, water management facilities, and temporary mine infrastructure. • Projected to produce a total of 3.6 million ounces of Palladium Equivalent (PdEq) over its current 12.5-year mine life.	Polygon	Not applicable
Wataynikaneyap Transmission Project	Yes	Between 90 kilometres north of Red Lake and 160 kilometres east of Pickle Lake	Phase 1: Operation Phase 2: Construction	Phase 1 - 236.5 Phase 2 - 198.7	Wataynikaneyap Power	2019	Unknown	Unknown	Yes - operations expected to overlap with Community Access Road construction and operations	• Construction of a 230 kilovolts line between Ignace and Dryden, to Pickle Lake (Phase 1). • Construction of electricity transmission lines to Pickle Lake and north of Red Lake, connecting 17 remote northern Ontario communities to grid power (Phase 2). • Operation of both project phases overlap with the construction and operations of the Community Access Road.	Polygon	100 metres

Project	Identified in Tailored Impact Statement Guidelines (Yes / No)	Location	Status	Distance (kilometres) and Direction from Community Access Road Study Area	Developer / Company	Project Start Date	Project Duration	Project Completion Date	Assumed Temporal Overlap with Community Access Road Activities (Yes / No)	Project Description	Map Feature Type	Map Buffer
Kasabonika Lake First Nation Band Representative Facility	No	Kasabonika Lake First Nation	Impact Assessment Ongoing	239.4	Kasabonika Lake First Nation	September 13, 2023	Unknown	Unknown	Yes -construction expected to overlap with Community Access Road construction	• The Kasabonika Lake First Nation Band Representative Facility project involves the construction of a new single-story Child and Family Service building and housing facilities for staff in the community of Kasabonika Lake. • Includes tree clearing, lot development, parking lot and laneway construction, connection to community's water and wastewater infrastructure and building construction.	Point	2.5 kilometres
Sugar Zone Gold Project	Yes	White River	Operating	238.9	Harte Gold Corp.	2019	Operation expected to be completed in 2029, decommissioning period unknown	Unknown	Yes - operations expected to overlap with Community Access Road construction	• High grade underground quartz mine in northern Ontario within the Dayohessarah Greenstone Belt. • Average milling rate of 575 tonnes per day.	Polygon	Not applicable
Accelerated High-Speed Internet Program	No	Across Ontario	Ongoing	Varies	Ministry of Infrastructure	August 4, 2022	Approximately 3 years	Anticipated end of 2028	Yes - construction and operation expected to overlap with Community Access Road construction	• Providing access to reliable, high-speed internet to unserved and underserved communities across the province by the end of 2028.	Line	100 metres
Mushkegowuk James Bay All-Season Road Coastal and Inland	No	James Bay Region, Ontario	Ongoing	Coastal - 251.3 Inland - 327.8	Mushkegowuk Council	Unknown	Unknown	Unknown	Yes - operations overlap with Community Access Road operations	• New all-season access road connecting four western James Bay communities and the Provincial highway network. • Includes 525 kilometre of gravel-surface public highway, 70 bridges and 100 additional medium and large diameter culverts to span watercourses.	Line	100 metres
Kashechewan First Nation - 20 Lot Development	No	Kashechewan First Nation (Ontario)	Impact Assessment Completed	261.2	Kashechewan First Nation (Ontario)	October 10, 2023	Unknown	Unknown	Yes - construction expected to overlap with Community Access Road construction	• Development of 20 lots with future use to build family homes for the community. • Each lot is roughly 929 metres in size. • The project will include site preparation activities including clearing, grubbing, granular placement, and servicing of lots with municipal utilities and services. • The Notice of Determination was issued on November 17, 2023, and determined that the project is not likely to cause significant adverse environmental effects.	Point	2.5 kilometres
Attawapiskat First Nation - Airport Heights Residential Subdivision	No	Attawapiskat First Nation	Impact Assessment Ongoing	265.8	Attawapiskat First Nation	October 11, 2023	Unknown	Unknown	Yes -construction expected to overlap with Community Access Road construction	• Lot servicing project, for a maximum of 28 serviced residential lots in the proposed Airport Heights Residential Subdivision.	Point	2.5 kilometres

Project	Identified in Tailored Impact Statement Guidelines (Yes / No)	Location	Status	Distance (kilometres) and Direction from Community Access Road Study Area	Developer / Company	Project Start Date	Project Duration	Project Completion Date	Assumed Temporal Overlap with Community Access Road Activities (Yes / No)	Project Description	Map Feature Type	Map Buffer
Musselwhite Mine	Yes	Southern shore of Opapimiskan Lake, approximately 480 kilometres north of Thunder Bay	Operations	273.5	Orla Mining Ltd.	April 1997	31 years	Mine expected to close in 2028, decommissioning period unknown	Yes - end of operations and decommissioning expected to overlap with Community Access Road construction	• Gold mine currently in operation. • Fly-in, fly-out operation on the southern shore of Opapimiskan Lake. • All-weather road connects Musselwhite Mine to the community of Pickle Lake. • Musselwhite property is 17.548 hectares, entirely on First Nations land. • Produced more than 4 million ounces of gold since April 1997. • The projected life of the mine has been extended from 2017 (the original estimated life of the mine) to approximately 2028 as additional mineral reserves have been confirmed by Orla Minning at the site.	Point	2.5 kilometres
Magino Mine	Yes	Wawa	Operating	307.0	Argonaut Gold	December 2012	Approximately 19 year mine life Decommissioning period anticipated 3 years, plus 10 years post-closure monitoring	Unknown	Yes - operations expected to overlap with Community Access Road construction	• Open-pit gold mine located in northern Ontario. • Includes mining of up to approximately 150 million tonnes of ore and approximately 430 million tonnes of mine rock.	Polygon	Not applicable
Island Gold Mine	Yes	Dubreuilville	Operating Expansion Phase 3+ in construction	307.2	Alamos Gold Inc	October 2007	Unknown	Anticipated 2026	Yes - Phase 1 operations expected to overlap with Community Access Road construction No - Phase 2 and 3 construction are not expected to overlap Community Access Road construction Yes - All operations expected to overlap with Community Access Road operations	• Gold mine located in northern Ontario. • Total mineable resources at 13.6 million tonnes. • Phase 1 expansion of operation completed in 2018. • Phase 2 was permitted in 2019, timing unknown. • Phase 3 announced in July 2020, timing unknown. • Phase 3+ announced in June 2022, timing unknown.	Polygon	Not applicable
Thunder Bay Airport Remedial Trial	No	Thunder Bay	Impact Assessment Ongoing	325.2	Transport Canada	January 1, 2024	Unknown	Unknown	Yes - construction expected to overlap with Community Access Road construction	• Remediation project at Thunder Bay Airport. • Includes the placement of 1 to 2 temporary containers (prefabricated sea containers or similar structures, approximately 12 metres by 3 metres in size) which will contain a remediation treatment unit, excavation of a trench (approximately 30 to 40 metres long) from which groundwater will be pumped and treated by the unit before the water is put back into the ground. • Associated works will include installation of electrical lines (approx. 1 kilometres) connecting the container to the existing power system, piping to connect the trench to the treatment unit, and a laydown area.	Point	2.5 kilometres

Project	Identified in Tailored Impact Statement Guidelines (Yes / No)	Location	Status	Distance (kilometres) and Direction from Community Access Road Study Area	Developer / Company	Project Start Date	Project Duration	Project Completion Date	Assumed Temporal Overlap with Community Access Road Activities (Yes / No)	Project Description	Map Feature Type	Map Buffer
Michipicoten First Nation White Sands Creek Rehabilitation Project	No	Wawa, Ontario	Impact Assessment Ongoing	327.9	Michipicoten First Nation	August 3, 2023	Unknown	Unknown	Yes - construction expected to overlap with Community Access Road construction	• Rehabilitation and increasing the resiliency of an approximately 200-metre-long section of Whitesands creek, which flows through the centre of the Michipicoten First Nation Whitesands residential area and feeds directly into Lake Superior. • Aims to reduce Michipicoten First Nation's vulnerability in the case of a major water event, improve water quality, rehabilitate terrestrial and aquatic habitat, and increase citizen education and access to nature. • Includes the replacement of two culverts; stabilizing the stream bank with gabions and planting culturally / ecologically significant vegetation; and enhancing a public greenspace with the addition of a terrace and educational signage.	Point	2.5 kilometres
North Caribou Lake First Nation - Immediate Housing Lot Servicing	No	North Caribou Lake First Nation - Weagamow Lake	Impact Assessment Complete	348.6	North Caribou Lake First Nation	February 2, 2024	Unknown	Unknown	Yes -construction expected to overlap with Community Access Road construction	• Site servicing project at North Caribou First Nation. • Includes preliminary design and site development. • Includes site development includes geotechnical investigations, site surveying, clearing, grubbing, site grading and compaction, and extension of water / sewer lines to each lot. • Indigenous Services Canada issued its Notice of Determination on April 3, 2024, and determined that the project is not likely to cause significant adverse environmental effects.	Point	2.5 kilometres
North Caribou Lake First Nation Water Treatment System Upgrades	No	North Caribou Lake First Nation	Construction Tendering Ongoing	349.3	North Caribou Lake First Nation	August 28, 2023	Unknown	Unknown	Yes -construction expected to overlap with Community Access Road construction	• Water Treatment System Upgrades at North Caribou Lake First Nation. • Includes site preparation; construction of a new water treatment system, watermain and distribution network; decommissioning and demolition of the existing treatment plant; and construction of a truckfill structure; and site restoration. • Indigenous Services Canada issued the Notice of Determination and determined that the project is not likely to cause adverse environmental effects.	Point	2.5 kilometres
Weeneebayko Area Health Authority Redevelopment	No	Moosonee and Moose Factory Island	Ongoing	366.4	Ministry of Infrastructure	January 2022	Unknown	Unknown	Yes - expected construction to overlap with Community Access Road construction	• Construction of a new hospital, Elder Care Lodge, visitor hostel and staff accommodations in Moosonee and a new Ambulatory Care Centre on Moose Factory Island.	Point	2.5 kilometres

Project	Identified in Tailored Impact Statement Guidelines (Yes / No)	Location	Status	Distance (kilometres) and Direction from Community Access Road Study Area	Developer / Company	Project Start Date	Project Duration	Project Completion Date	Assumed Temporal Overlap with Community Access Road Activities (Yes / No)	Project Description	Map Feature Type	Map Buffer
Goliath Gold Project	Yes	Dryden	Permitting ongoing	437.1	Treasury Metals Inc.	January 18, 2013	Unknown	Unknown	Yes - construction and operations expected to overlap with Community Access Road construction and operations	• Construction, operation, decommissioning and abandonment of an open-pit and underground gold mine. • Production capacity of 5,424 tonnes per day with a 12 year mine life.	Polygon	Not applicable
Springpole Lake Gold Project	Yes	Uchi Lake	Impact Assessment Ongoing	378.5	First Mining Gold Corp.	April 27, 2018	Based on Impact Assessment, operation is expected to be 12 years Decommissioning expected 6 years Post-closure monitoring period unknown	Unknown	Yes - construction and operations expected to overlap with Community Access Road construction and operations	• Impact assessment for the construction, operation, decommissioning and abandonment of an open-pit gold / silver mine and onsite metal mill. • Production capacity of 60,00 tonnes per day over an 11-year mine life. • Draft Environmental Impact Statement / Environmental Assessment materials were prepared and made available in April 2022.	Polygon	Not applicable
Crawford Nickel Project	Yes	34 kilometres north of Timmins, Ontario	Impact Assessment Ongoing	421.2	Canada Nickel Company	August 8, 2022	Operations expected for 43 years	Unknown	Yes - operations expected to overlap with Community Access Road construction and operations	• Construction, operation, decommissioning and abandonment of an open-pit nickel-cobalt mine and onsite metal mill. • Mine ore production capacity of 275,000 tonnes per day and a mill ore input capacity of 120,000 tonnes per day. • Operation is expected for approximately 43 years. • Operation is anticipated to begin in 2027.	Polygon	Not applicable
Hammond Reef Project	Yes	Atikokan	Permitting ongoing	388.8	Agnico Eagle Mines Limited	2027	14 Years (3 construction, 11 operations, closure to be determined)	Unknown	Yes - construction and operations expected to overlap with Community Access Road construction and operations	• Construction, operation and decommission of an open-pit gold mine. • Operational life of 11 years. • Includes two open pits, ore processing facility, tailings management facility, waste rock and water management facilities, 19 kilometres long 230 kilovolts transmission line, access road, and an onsite worker accommodation camp. • The Company requires additional federal and provincial permits to begin construction activities and with a 2.5-year construction timeline, the Hammond Reef Project could potentially be ready for production in 2027. • The project has not been approved by Agnico Eagle for development.	Polygon	Not applicable
Nuclear Waste Management Organization's Deep Geological Repository	No	Ignace, Ontario	Site selection ongoing	423.1	Nuclear Waste Management Organization	2010	Unknown	Unknown	Yes -if candidate location is chosen, then construction and operations expected to overlap with Community Access Road construction and operations	• Candidate location for the deep geological repository.	Point	2.5 kilometres

Project	Identified in Tailored Impact Statement Guidelines (Yes / No)	Location	Status	Distance (kilometres) and Direction from Community Access Road Study Area	Developer / Company	Project Start Date	Project Duration	Project Completion Date	Assumed Temporal Overlap with Community Access Road Activities (Yes / No)	Project Description	Map Feature Type	Map Buffer
Pamour Mine	Yes	Timmins, Ontario	Operating	461.2	Newmont	1910	Operation expected until 2035, decommissioning period unknown	2035	Yes - operations expected to overlap with Community Access Road construction and operations	• Underground mine, open-pit, and stockpiles gold mine operation. • Associated locations: Broden and Hoyle Pond Underground. • November 2022 new water treatment plant constructed. • 60% of gold comes from Hyle Pond underground mine, remaining ore comes from Hollinger Open-Pit Mine.	Point	2.5 kilometres
Côté Gold Mine	Yes	Gogama	Operations	483.5	IAMGOLD Corp. / Sumitomo Metal Mining	May 3, 2013	Approximately 18 year mine life, decommissioning period unknown	Unknown	Yes - operations expected to overlap with Community Access Road construction and operations	• Construction, operation and rehabilitation of a new open-pit gold mine, covering approximately 1,050 hectares of land. • Processing will occur at a rate of approximately 36,000 tonnes per day. • Mining operations will be supported by the development of an explosives manufacturing and storage facility, maintenance garage, warehouse and administration complex. • Approximately 18 year mine life.	Polygon	Not applicable
Great Bear Gold Project	Yes	23 kilometres southeast of Red Lake, Ontario	Impact Assessment Pending	478.7	Kinross Gold Corporation	August 17, 2023	Mine life of approximately 25 years is expected Decommissioning period of 4 years, plus post-closure and monitoring period (timing unknown)	Unknown	Yes - operations expected to overlap with Community Access Road construction and operations	• Construction, operation, decommissioning and abandonment of a new open-pit and underground gold mine with an onsite metal mill. • Includes three open pits and is estimated to produce up to 60,000 tonnes per day, while the metal mill would process up to 15,000 tonnes of ore per day. • Operation is expected for approximately 20 years.	Polygon	Not applicable
Young-Davidson Mine	Yes	Matachewan, Ontario	Operating	526.7	Almos Gold Inc.	2012	25 years	Anticipated 2037	Yes - operations expected to overlap with Community Access Road construction and operations	• Underground gold mine near Matachewan, Ontario. • Multi-year expansion of the project completed in 2020.	Point	2.5 kilometres
Proposed Sault Ste. Marie Ferrochrome Production Facility	No	Sault Ste. Marie, Ontario	Site selection ongoing	492.5	Noront	2019	Construction approximately 5 to 10 years	Unknown	Yes - construction and operations expected to overlap with Community Access Road construction and operations	• Candidate location for proposed new ferrochrome processing plant in Sault Ste. Marie.	Point	2.5 kilometres
Separation Rapids	Yes	55 kilometres north of Kenora	Permitting ongoing	559.7	Avalon Advanced Materials Inc.	2026	Unknown	Unknown	Yes - construction and operations expected to overlap with Community Access Road construction and operations	• Lithium deposit in northern Ontario. • Anticipated target date for commencement of lithium concentrate production is early 2026.	Point	2.5 kilometres

Project	Identified in Tailored Impact Statement Guidelines (Yes / No)	Location	Status	Distance (kilometres) and Direction from Community Access Road Study Area	Developer / Company	Project Start Date	Project Duration	Project Completion Date	Assumed Temporal Overlap with Community Access Road Activities (Yes / No)	Project Description	Map Feature Type	Map Buffer
Upper Beaver Gold Project	Yes	19 kilometres east of Kirkland Lake, Ontario	Impact Assessment Ongoing	567.6	Agnico Eagle Mines Ltd.	September 13, 2021	Unknown	Unknown	Yes - construction and operations expected to overlap with Community Access Road construction and operations	• Construction, operation, decommissioning and abandonment of an underground and open-pit gold and copper mine. • Includes onsite metal mill and structures for diverting water. • Maximum ore capacity is approximately 15,000 tonnes per day. • Mine life is approximately 16 years.	Polygon	Not applicable
Proposed Sudbury Ferrochrome Production Facility	No	Sudbury, Ontario	Site selection ongoing	608.1	Noront	2019	Construction approximately 5 to 10 years	Unknown	Yes - construction and operations expected to overlap with Community Access Road construction and operations	• Candidate location for proposed new ferrochrome processing plant in Sudbury.	Point	2.5 kilometres
Ogoki Forest Management Plans	Yes	Ogoki Forest, Ontario	Operating	Forest Management Plans: Varies Ogoki Primary Roads: 6.2 kilometres	GreenForest Management Inc. and Geraldton Area Natural Resources Advisory Committee	2020	10 years	2030	Yes - operations overlap with Community Access Road construction and operations	• Forest Management Plans for the Ogoki Forest. • Includes Ogoki-Armstrong Primary Roads as these roads are being used for forest management. • Includes plans for future harvest. • Ogoki Forest is approximately 10,900 square kilometres in size and includes approximately 9,798 square kilometres of forested area. • Majority of the forest is Crown land and is subject to forest management planning and forest management operations.	Polygon	100 metres
KWG Railway Project	No	James Bay Lowlands	Unknown	Unknown	KWG Resources Spider Resources	2009	Unknown	Unknown	No - assumed no overlap as status of this project is not known.	• Approximately 350-kilometre rail link from Nakina, Ontario to the Ring of Fire mines. • Exact alignment and location of proposed railway is not known at the time of preparation of this Cumulative Effects Assessment, therefore this project is not shown on the Inclusions List Map.	Not applicable	Not applicable
Neskantaga First Nation Community Recreation Centre	No	Neskantaga First Nation	Impact Assessment ongoing	110.9	Neskantaga First Nation	2008	Unknown	Unknown	No - no expected overlap	• Renovation of the existing community recreation centre and arena, to include an additional 2,400 square feet in size and will include washrooms.	Point	2.5 kilometres
Little Jackfish River Hydroelectric Project	No	Little Jackfish River watershed	Impact Assessment on hold	124.2	Ontario Power Generation	2009	Unknown	On hold	No - overlap not anticipated as project is on hold	• Development of approximately 100 megawatts of renewable hydroelectric power through the construction of two generating stations on the Little Jackfish River. • The location of the Proposed Undertaking is shown on the map, and the anticipated zone of influence is within the Little Jackfish River watershed. Each generating station will include a dam with a water intake and bypass structures, powerhouse and tailrace channel. Associated facilities include access roads and a large temporary construction camp. • Project has been on hold since 2015.	Point	2.5 kilometres

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Rehabilitation of Nibinamik Lagoon Sewage Treatment Lagoon and Collection Systems	Yes	Nibinamik First Nation	Construction	173.1	Nibinamik First Nation	2022	2 years	2024	No - no expected overlap	• Repair and replacement of components of a sewage lagoon and the purchase of a septic truck in Nibinamik First Nation • Includes re-excavating and repairing 30 manholes and covers, flushing outflow lines, removing and replacing 2 pressure relief values, repairing damaged section of the lagoon and buying a septic truck.	Point	2.5 kilometres
Ginoogaming KM 132 Bridge Replacement	No	Ginoogaming First Nation	Construction Tendering Ongoing	194.7	Ginoogaming First Nation	August 23, 2023	Approximately 2 years	October 15, 2025	No - no expected overlap	• Replacement of the Bridge located on Caltonite known as kilometres 132 bridge in Ginoogaming First Nation • Indigenous Services Canada issued its Notice of Determination on October 27, 2023, and determined that the project is not likely to cause significant adverse environmental effects.	Point	2.5 kilometres
New Osnaburgh Water Treatment Plant Upgrades	No	New Osnaburgh, Ontario	Impact Assessment complete	242.2	Mishkeegogamang First Nation	March 1, 2021	Unknown	Unknown	No - no expected overlap	• Upgrade the existing water treatment plant, extend the water distribution system to planned lot developments as well as un-serviced homes, improve the reservoir for better fire flows and increased fire protection. • Infrastructure Canada issued its Notice of Determination on October 16, 2023, and determined that the project is not likely to cause significant adverse environmental effects.	Point	2.5 kilometres
Thierry Copper Nickel Mine	Yes	Pickle Lake	Unknown	251.0	Canadian Critical Minerals Inc	Unknown	Unknown	Uknown	No - not applicable	• Copper and nickel mine located 15 kilometres west of Pickle Lake. • Property is approximately 4,700 hectares in size. • Project cannot be assessed as reasonably foreseeable activities in the Cumulative Effects Assessment as plans for future development have not been disclosed at the time of preparing the Environmental Assessment / Impact Statement.	Point	2.5 kilometres
Repairs and Upgrades to Sewage Lagoon Attawapiskat First Nation	No	Attawapiskat First Nation	Uknown	267.8	Unknown	Unknown	Unknown	Unknown	No - not applicable	• Project cannot be assessed as reasonably foreseeable activities in the Cumulative Effects Assessment as plans for future development have not been disclosed at the time of preparing the Environmental Assessment / Impact Statement.	Point	2.5 kilometres

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Rehabilitation of the Whitefish Bay Water Distribution System	No	Lac Seul First Nation	Impact Assessment Complete	268.1	Lac Seul First Nation	August 8, 2022	Unknown	Unknown	No - no expected overlap	• Replacement of aged and undersized watermain in Lac Seul First Nation to meet current water demands and fire protection, in accordance with current regulations and standards. • Includes the replacement of the aged and undersized 50 millimetres watermain, with the properly sized 150 millimetres watermain, replacement of the aged an undersized and waterline (lake crossing), reconnection of existing water services to existing homes and buildings; and supply and installation of two upgraded high lift pumps. • Infrastructure Canada issued a Notice of Determination on January 29, 2024, and has determined the proposed Rehabilitation of the project is not likely to cause significant adverse environmental effects.	Point	2.5 kilometres
Kapuskasing River Waterpower Projects	No	Kapuskasing, Ontario	Impact Assessment on Hold	Clouston Rapids: 359.2 Cedar Rapids: 344.5 Buchan Falls: 349.0	Xeneca Power Development Inc	2009	Unknown	On hold	No - overlap not anticipated as project is on hold	• Environmental evaluation and assessment for three proposed Generating Stations located at Buchan Falls, Middle Township Buchan (Clouston Rapids) and at Near North Boundary (Cedar Rapids). • Each site is located on the Kapuskasing River, between the community of Elsas and the Town of Kapuskasing. • The proposed waterpower generating stations on the Kapuskasing River will generate clean and renewable energy at a total installed capacity of about 19.45 megawatts. Each station will have a water control structure (spillway and earthfill dams) with attached powerhouse (with the exception of Outlet Kapuskasing Lake which will have a spillway dam and an open approach channel to the powerhouse). • New roads and possible upgrades of existing roads will be required to access the sites. Transmission lines connecting at Weston Lake Transmission Station / Distribution Station and / or Kapuskasing Transmission Station will be installed to connect the stations to the provincial power grid. • Project has been on hold since 2014.	Point	2.5 kilometres
Sewage Pumping Station Rehabilitation	No	Weenusk First Nation	Construction	355.8	Weenusk First Nation	2022	2 years	March 2024	No - no expected overlap	• Replacement of pumps, panel and level floats; installing provisions for auto dialer; replacing guide rails and piping; replacing wooden manhole; installing access ladder; installing standby fixed generator; and associated electrical work.	Point	2.5 kilometres

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Moose Cree First Nation Water Treatment Plant	No	Moose Cree First Nation (Ontario)	Impact Assessment ongoing	363.7	Moose Cree First Nation (Ontario)	Unknown	Unknown	Anticipated November 2024	No - no expected overlap, project will be complete prior to Community Access Road construction	• Proposed water treatment plant at Moose Cree First Nation, 1,435 square metres in size. • Includes a water treatment system and distribution piping. • The project includes construction over top of a below ground concrete reservoir, installation of a new raw water intake pipe into the Moose River, fish screen, raw water pumping chamber, new watermain and service piping, housing development on the northeast side of the community.	Point	2.5 kilometres
Pigeon River Drilled Well Groundwater Supply	No	Canadian Border Services Agency Pigeon River	Impact Assessment Complete	369.1	Canada Border Services Agency	February 14, 2024	Unknown	Unknown	No - no expected overlap	• Design and construct for two new 15,000 litre potable water tanks (to be installed underground) for purposes of supplying potable water to the facility. Provide new waterproof tub and isolated lid, as well as new culvert complete with hinged and locking cover. • Connect potable water piping complete with insulation, heat trace, isolation valving and check valves though tub wall and route piping through trench to existing water treatment building in close proximity. • Excavation required to native subgrade and backfill using excavated fill and clear stone as required to provide 3:1 grading to native subgrade, finished with topsoil and sod. • Includes re-configuring the existing cistern for firefighting water use. • The Canada Border Services Agency issued its Notice of Determination on February 14, 2024, and determined that the project is not likely to cause significant adverse environmental effects.	Point	2.5 kilometres
Ivanhoe River Waterpower Project	No	Chapleau, Ontario	Impact Assessment on hold	Three Falls: 383.9 Chute: 394.1	Xeneca Power Development Inc.	2009	Unknown	On hold	No - overlap not anticipated as project is on hold	• Environmental evaluation and assessment on two proposed Generating Stations located on the Ivanhoe River, in Montcalm and Bedford Townships, north of the town of Foleyet. • The proposed waterpower generating stations will generate clean, green, renewable energy at a total installed capacity of about 8.7 megawatts. Each station will have a water control structure (spillway dam) with attached powerhouse. • Upgrades of existing forestry roads will be required to access the sites. A transmission line connecting at Weston Lake Distribution Station will be installed to connect the stations to the provincial power grid. • Project has been on hold since 2014.	Point	2.5 kilometres

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Lac Seul First Nation Burial Site Mapping	No	Lac Seul First Nation	Impact Assessment ongoing	401.1	Lac Seul First Nation	August 4, 2024	Unknown	Unknown	No - no expected overlap	• Shoreline erosion protection project for five traditional burial grounds along the banks of the Lost Lake and Lac Seul.	Point	2.5 kilometres
Fort Severn Modular Bridge	No	Fort Severn Remote Northern Airport	Design upcoming	471.1	Ministry of Transportation	2023	Approximately 3 years	2025 to 2026	No - no expected overlap	• Bridge replacement at Fort Severn Remote Northern Airport.	Point	2.5 kilometres
Sandy Lake Cultural Area	No	Sandy Lake First Nation	Design ongoing	478.3	Sandy Lake First Nation	April 5, 2023	Unknown	Unknown	No - no expected overlap	• New cultural area including an outdoor celebration area with seating for 250 people, traditional fireplaces, women's longhouses, and seating areas at Sandy Lake First Nation. • The area will be adjacent to Sandy Lake, and docks will be added to promote traditional fishing. • Crown-Indigenous Relations and Northern Affairs Canada issued its Notice of Determination and determined that the project is not likely to cause significant adverse environmental effects.	Point	2.5 kilometres
Sandy Lake First Nation - Child and Family Services Building	No	Sandy Lake First Nation	Impact Assessment ongoing	478.6	Sandy Lake First Nation	July 25, 2023	Unknown	Unknown	No - no expected overlap	• Construction of a Child and Family Services Building Project at Sandy Lake First Nation. • Building will be approximately 1,900 square metres footprint, serviced with electricity, water / wastewater systems, internet. • Includes a parking lot, and appropriate drainage ditching.	Point	2.5 kilometres
Bateman Gold	Yes	Red Lake	Unknown	488.0	Evolution Mining	Unknown	Unknown	Unknown	No - not applicable	• Gold deposit located in northern Ontario. • Project includes a commissioned shaft and significant underground development, 1,250 tonne per day mill facility, tailings management facility, electric power supple and substation, and 200-person camp. • Project cannot be assessed as reasonably foreseeable activities in the Cumulative Effects Assessment as plans for future development have not been disclosed at the time of preparing the Environmental Assessment / Impact Statement.	Point	2.5 kilometres
Chukuni River Bridge Replacement	No	Balmertown, Red Lake, Ontario	Preliminary Design	490.6	Ministry of Transportation	2021	Approximately 5 years	2025 to 2026	No - no expected overlap	• Bridge replacement at Chukuni River, 4 kilometres south of Highway 105	Point	2.5 kilometres
Hwy 618 Reconstruction and Rehabilitation	No	Northwestern Ontario	Planning / Environmental Assessment upcoming	494.9	Ministry of Transportation	2023	Approximately 3 years	2025 to 2026	No - no expected overlap	• Reconstruction and rehabilitation of Highway 618 southerly, towards Red Lake, Ontario.	Line	100 metres
Western James Bay and Southwestern Hudson Bay National Marine Conservation Area	No	James Bay Region, Ontario	Ongoing	277.2	Mushkegowuk Council and Parks Canada	Unknown	Unknown	Unknown	No - no expected overlap	• Proposed National Marine Conservation Area in the James Bay and Hudson Bay Marine Regions. • Project is currently assessing the feasibility of a National Marine Conservation Area.	Polygon	Not applicable

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Waasigan Transmission Line Project - Route 1	No	Thunder Bay to Dryden, Ontario	Impact Assessment ongoing	305.5	Hydro One	2019	Unknown	Unknown	No - no expected overlap	• Proposed new double-circuit 230 kilovolt transmission line between the Lakehead Transformer Station in the Municipality of Shuniah and the Mackenzie Transformer Station in the Town of Atikokan • A new single-circuit 230 kilovolts transmission line between the Mackenzie Transformer Station and the Dryden Transformer Station in the City of Dryden.	Line	100 metres
Backcountry Paddling Site Upgrades	No	Pukaskwa National Park	In progress	233.5	Parks Canada	March 5, 2024	Unknown	Unknown	No - no expected overlap	• Upgrade five existing backcountry paddling campsites along the Lake Superior coastline. • Upgrades will include a new bear-proof food locker, a new pit-privy, and access trails from the existing campsite to the new infrastructure.	Point	2.5 kilometres
Dona Lake Gold Project	No	Pickle Lake	Ongoing	231.4	Metals Creek Resources Corp	Unknown	Unknown	Unknown	No - not applicable.	• Gold Mine near Pickle Lake, Ontario. • Project cannot be assessed as reasonably foreseeable activities in the Cumulative Effects Assessment as plans for future development have not been disclosed at the time of preparing the Environmental Assessment / Impact Statement.	Point	2.5 kilometres
Black Bird Deposit	Yes	James Bay Lowlands	Not Active	97.3	Wyloo	Not applicable	Not applicable	Not applicable	Not applicable	• Chromite deposit in the James Bay Lowlands area, as part of the McFaulds Lake project. • Approximately 23.5 million tonnes of chromite. • Project cannot be assessed as reasonably foreseeable activities in the Cumulative Effects Assessment as plans for future development have not been disclosed at the time of preparing the Environmental Assessment / Impact Statement. • Not included in the Cumulative Effects Assessment as it is a deposit and not currently an active project.	Point	2.5 kilometres
Junior Lake Project	Yes	85 kilometres north of Beardmore	Not Active	98.2	Landore Resources Limited	Not applicable	Not applicable	Not applicable	Not applicable	• Consists of approximately 30,507 hectares of property, containing a number of precious metal deposits including deposits for gold, nickel, copper, cobalt, platinum, and palladium. • Not included in the Cumulative Effects Assessment as it is a deposit and not an active project.	Point	2.5 kilometres

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Big Daddy Deposit	Yes	James Bay Lowlands	Not Active	100.5	Wyloo	Not applicable	Not applicable	Not applicable	Not applicable	• Open-pit mine, crushing plant, site infrastructure, railway and power line to a chromite deposit in the James Bay Lowlands area, as part of the McFaulds Lake project. • Approximately 38 million tonnes of resources. • Project cannot be assessed as reasonably foreseeable activities in the Cumulative Effects Assessment as plans for future development have not been disclosed at the time of preparing the Environmental Assessment / Impact Statement. Not included in the Cumulative Effects Assessment as it is a deposit and not currently an active project.	Point	2.5 kilometres
Black Label Deposit	Yes	James Bay Lowlands	Not Active	103.6	Wyloo	Not applicable	Not applicable	Not applicable	Not applicable	• Chromite deposit in the James Bay Lowlands area, as part of the McFaulds Lake project. • Approximately 5.40 million tonnes of resources. • Project cannot be assessed as reasonably foreseeable activities in the Cumulative Effects Assessment as plans for future development have not been disclosed at the time of preparing the Environmental Assessment / Impact Statement. • Not included in the Cumulative Effects Assessment as it is a deposit and not currently an active project.	Point	2.5 kilometres
Black Thor Deposit	Yes	James Bay Lowlands	Not Active	103.6	Wyloo	Not applicable	Not applicable	Not applicable	Not applicable	• Chromite deposit located on the edges of James Bay Lowlands, as part of the McFaulds Lake project. • Approximately 137.70 million tonnes of resources. • Expected to have a lifespan of 30 years or greater. • Project cannot be assessed as reasonably foreseeable activities in the Cumulative Effects Assessment as plans for future development have not been disclosed at the time of preparing the Environmental Assessment / Impact Statement. • Not included in the Cumulative Effects Assessment as it is a deposit and not currently an active project.	Point	2.5 kilometres

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Martison Project	Yes	70 kilometres north of Hearst, Ontario	Not Active	225.3	Fox River Resources	Not applicable	Not applicable	Not applicable	Not applicable	• Open-pit phosphate deposit in northern Ontario. • Project cannot be assessed as reasonably foreseeable activities in the Cumulative Effects Assessment as plans for future development have not been disclosed at the time of preparing the Environmental Assessment / Impact Statement. • Not included in the Cumulative Effects Assessment as it is a deposit and not an active project.	Point	2.5 kilometres
Zenyatta Venture's Albany Graphite Deposit	Yes	Northeastern Ontario	Not Active	168.8	Zenyatta Ventures Ltd./ Albany Graphite Corporation	Not applicable	Not applicable	Not applicable	Not applicable	• Development of a graphite deposit located 30 kilometres north of the Trans-Canada Highway near Constance Lake First Nation and Hearst. • Project cannot be assessed as reasonably foreseeable activities in the Cumulative Effects Assessment as plans for future development have not been disclosed at the time of preparing the Environmental Assessment / Impact Statement. • Not included in the Cumulative Effects Assessment as it is a deposit and not an active project.	Point	2.5 kilometres
Georgia Lake Project	Yes	Thunder Bay North	Not Active	172.0	Rock Tech Lithium Inc.	Not applicable	Not applicable	Not applicable	Not applicable	• Lithium deposit located near Thunder Bay. • Project cannot be assessed as reasonably foreseeable activities in the Cumulative Effects Assessment as plans for future development have not been disclosed at the time of preparing the Environmental Assessment / Impact Statement. • Not included in the Cumulative Effects Assessment as it is a deposit and not an active project.	Point	2.5 kilometres
Superior Lake Zinc and Copper Project	Yes	150 kilometres east-northeast of Thunder Bay	Operating	198.8	Waroona Energy Inc.	2019	Not applicable	Not applicable	Not applicable	• Consists of two zinc and copper deposits, Pick Lake and Winston Lake. • Project cannot be assessed as reasonably foreseeable activities in the Cumulative Effects Assessment as plans for future development have not been disclosed at the time of preparing the Environmental Assessment / Impact Statement. • Not included in the Cumulative Effects Assessment as it is a deposit and not an active project.	Point	2.5 kilometres
Kasabonika Modular Bridge and Remote Northern Airport	No	Kasabonika	Design Underway	240.2	Ministry of Transportation	2024	Unknown	Unknown	Not applicable	• Project cannot be assessed as reasonably foreseeable activities in the Cumulative Effects Assessment as plans for future development have not been disclosed at the time of preparing the Environmental Assessment / Impact Statement.	Point	2.5 kilometres

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Root - Green Technology Metals	Yes	Slate Falls First Nation	Not Active	342.3	Green Technology Metals	Not applicable	Not applicable	Not applicable	Not applicable	• Lithium deposits near Root Lake in northern Ontario • Drilling is currently paused at the Root project for Green Technology Metals to identify priority drilling targets • Not included in the Cumulative Effects Assessment as it is a deposit and not an active project.	Point	2.5 kilometres
Raleigh Lake Project	Yes	Ignace, Ontario	Not Active	407.6	International Lithium Corp.	Not applicable	Not applicable	Not applicable	Not applicable	• Lithium and Rubidium deposit. • Project cannot be assessed as reasonably foreseeable activities in the Cumulative Effects Assessment as plans for future development have not been disclosed at the time of preparing the Environmental Assessment / Impact Statement. • Not included in the Cumulative Effects Assessment as it is a deposit and not an active project.	Point	2.5 kilometres
West Cache Gold Project	Yes	Cochrane, Ontario	Not Active	448.3	Galleon Gold Corp.	Not applicable	Not applicable	Not applicable	Not applicable	• Gold deposit located near Cochrane, Ontario. • Project cannot be assessed as reasonably foreseeable activities in the Cumulative Effects Assessment as plans for future development have not been disclosed at the time of preparing the Environmental Assessment / Impact Statement. • Not included in the Cumulative Effects Assessment as it is a deposit and not an active project.	Point	2.5 kilometres
PAK - Frontier Lithium	Yes	Unknown	Not Active	470.9	Frontier Lithium Ltd.	Not applicable	Not applicable	Not applicable	Not applicable	• Lithium deposit. • Project cannot be assessed as reasonably foreseeable activities in the Cumulative Effects Assessment as plans for future development have not been disclosed at the time of preparing the Environmental Assessment / Impact Statement. • Not included in the Cumulative Effects Assessment as it is a deposit and not an active project.	Point	2.5 kilometres
Bradshaw Gold Deposit	Yes	Timmins, Ontario	Not Active	446.6	Gowest Gold	Not applicable	Not applicable	Not applicable	Not applicable	• Gold deposit near Timmins, Ontario. • Total amount of gold is approximately 1,787,295 tonnes. • Project cannot be assessed as reasonably foreseeable activities in the Cumulative Effects Assessment as plans for future development have not been disclosed at the time of preparing the Environmental Assessment / Impact Statement. • Not included in the Cumulative Effects Assessment as it is a deposit and not an active project.	Point	2.5 kilometres

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Kenbridge Nickel Project	Yes	Northwestern Ontario	Not Active	520.1	Tartisan Nickel Corp.	Not applicable	Not applicable	Not applicable	Not applicable	• Nickel deposit in northwestern Ontario. • Project cannot be assessed as reasonably foreseeable activities in the Cumulative Effects Assessment as plans for future development have not been disclosed at the time of preparing the Environmental Assessment / Impact Statement. • Not included in Cumulative Effects Assessment as it is a deposit and not an active project.	Point	2.5 kilometres
Tower Gold Deposit	Yes	100 kilometres east of Timmins, Ontario	Not Active	535.4	Moneta Gold	Not applicable	Not applicable	Not applicable	Not applicable	• Open-pit gold deposit near Timmins, Ontario • Not included in the Cumulative Effects Assessment as it is a deposit and not an active project.	Point	2.5 kilometres
Bending Lake Iron Project	No	49 kilometres south of Ignace, Ontario	Terminated	426.9	Ambershaw Metals Inc.	Unknown	Unknown	Unknown	Not applicable	• Project cannot be assessed as reasonably foreseeable activities in the Cumulative Effects Assessment as plans for future development have not been disclosed at the time of preparing the Environmental Assessment / Impact Statement.	Point	2.5 kilometres
Hercules Gold Project	No	210 kilometres northeast of Thunder Bay	Ongoing	122.42	Gold'n Futures Mineral Corp	Unknown	Unknown	Unknown	Not applicable.	• Gold deposit within the municipality of Greenstone. • Project cannot be assessed as reasonably foreseeable activities in the Cumulative Effects Assessment as plans for future development have not been disclosed at the time of preparing the Environmental Assessment / Impact Statement. • Not included in the Cumulative Effects Assessment as it is a deposit and not an active project.	Point	2.5 kilometres
Pickle Lake Gold Project	No	Pickle Lake	Ongoing	297.5	Ardiden	Unknown	Unknown	Unknown	Not applicable	• Gold deposit near Pickle Lake. • Project cannot be assessed as reasonably foreseeable activities in the Cumulative Effects Assessment as plans for future development have not been disclosed at the time of preparing the Environmental Assessment / Impact Statement. • Not included in the Cumulative Effects Assessment as it is a deposit and not an active project.	Point	2.5 kilometres
Animbiigoo Zaagi'igan Anishinaabek	No	Animbiigoo Zaagi'igan Anishinaabek	Not applicable	119.4	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	• Location of Animbiigoo Zaagi'igan Anishinaabek.	Community	Not applicable

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Northern Star Eagle Limited and Southern Star Eagle Limited Drilling Program	No	General area of Webequie First Nation	Ongoing	Northern: Site 1: 142.3 Site 2: 159.2 Southern: 66.5	Northern Star Eagle and Southern Star Eagle	Not applicable	Not applicable	Not applicable	Not applicable	• Diamond deposit. • Project cannot be assessed as reasonably foreseeable activities in the Cumulative Effects Assessment as plans for future development have not been disclosed at the time of preparing the Environmental Assessment / Impact Statement. • Not included in the Cumulative Effects Assessment as it is a deposit and not an active project. • Although a specific project footprint is not available at the time of completion the Cumulative Effects Assessment, existing exploration sites have been included into the base case landcover.	Point	2.5 kilometres
Aroland First Nation	No	Aroland First Nation	Not applicable	29.4	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	• Location of Aroland First Nation reserve.	Community	Not applicable
Attawapiskat First Nation	No	Attawapiskat First Nation	Not applicable	264.5	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	• Location of Attawapiskat First Nation reserve.	Community	Not applicable
Constance Lake First Nation	No	Constance Lake First Nation	Not applicable	196.9	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	• Location of Constance Lake First Nation reserve.	Community	Not applicable
Eabametoong First Nation	No	Eabametoong First Nation	Not applicable	68.1	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	• Location of Eabametoong First Nation reserve.	Community	Not applicable
Fort Albany First Nation	No	Fort Albany First Nation	Not applicable	269.6	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	• Location of Fort Albany First Nation reserve.	Community	Not applicable
Ginoogaming First Nation	No	Ginoogaming First Nation	Not applicable	103.3	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	• Location of Ginoogaming First Nation reserve.	Community	Not applicable
Kasabonika Lake First Nation	No	Kasabonika Lake First Nation	Not applicable	239.1	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	• Location of Kasabonika First Nation reserve.	Community	Not applicable
Kashechewan First Nation	No	Kashechewan First Nation	Not applicable	269.6	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	• Location of Kashechewan First Nation reserve.	Community	Not applicable
Kingfisher Lake First Nation	No	Kingfisher Lake First Nation	Not applicable	250.9	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	• Location of Kingfisher Lake First Nation reserve.	Community	Not applicable
Kitchenuhmaykoosib First Nation	No	Kitchenuhmaykoosib First Nation	Not applicable	299.5	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	• Location of Kitchenuhmaykoosib First Nation reserve.	Community	Not applicable
Long Lake No.58 First Nation	No	Long Lake No.58 First Nation	Not applicable	100.1	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	• Location of Long Lake No. 58 First Nation reserve.	Community	Not applicable
Marten Falls First Nation	No	Marten Falls First Nation	Not applicable	0.00	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	• Location of Marten Falls First Nation reserve.	Community	Not applicable
Mishkeegogamang First Nation	No	Mishkeegogamang First Nation	Not applicable	231.8	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	• Location of Mishkeegogamang First Nation reserve.	Community	Not applicable
Neskantaga First Nation	No	Neskantaga First Nation	Not applicable	109.7	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	• Location of Neskantaga First Nation reserve.	Community	Not applicable
Nibinamik First Nation	No	Nibinamik First Nation	Not applicable	174.4	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	• Location of Nibinamik First Nation reserve.	Community	Not applicable
Red Sky Métis Independent Nation	No	Red Sky Métis Independent Nation	Not applicable	320.0	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	• Location of Red Sky Métis Independent Nation reserve.	Community	Not applicable
Wapekeka First Nation	No	Wapekeka First Nation	Not applicable	293.6	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	• Location of Wapekeka First Nation reserve.	Community	Not applicable

Project	Identified in Tailored Impact Statement Guidelines (Yes / No)	Location	Status	Distance (kilometres) and Direction from Community Access Road Study Area	Developer / Company	Project Start Date	Project Duration	Project Completion Date	Assumed Temporal Overlap with Community Access Road Activities (Yes / No)	Project Description	Map Feature Type	Map Buffer
Wawakapewin First Nation	No	Wawakapewin First Nation	Not applicable	252.5	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	• Location of Wawakapewin First Nation reserve.	Community	Not applicable
Webequie First Nation	No	Webequie First Nation	Not applicable	120.9	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	• Location of Webequie First Nation reserve.	Community	Not applicable
Weenusk First Nation	No	Weenusk First Nation	Not applicable	354.7	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	• Location of Weenusk First Nation reserve.	Community	Not applicable
Wunnumin First Nation	No	Wunnumin First Nation	Not applicable	206.5	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	• Location of Wunnumin First Nation reserve.	Community	Not applicable
Animbiigoo Zaagi'igan Anishinaabek	No	Animbiigoo Zaagi'igan Anishinaabek	Not applicable	119.4	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	• Location of Animbiigoo Zaagi'igan Anishinaabek reserve.	Community	Not applicable

Assumptions: - Information and projects presented in this table represent the information publicly available at the time the Cumulative Effects Assessment was completed.
- Construction of the Community Access Road is anticipated to start within 2 to 5 years of Environmental Assessment approval, depending on funding and permit acquisition.
- Construction of the Community Access Road duration is anticipated to be 10 years.

Definitions: **Project Start Date:** Date that the Environmental Assessment or other permitting processes for the project started. Where information was available on the Impact Assessment Agency of Canada website, start date and Notice of Determination date and recommendations is included.

Project Duration: Amount of time (years) project activities will take place. Where information was available and applicable, duration of each project phase is noted.

Project Completion Date: Date all activIities for the project will be completed. Completion date varies depending on type of project; bridge or highway updates completion date reflects when construction of the project is complete, and mining projects completion date reflects when the decommissioning and rehabilitation activities are complete / mine is abandoned.

Assumed Temporal Overlap with Community Access Road Activities: The phases each project is anticipated to overlap with the Community Access Road. Overlap is assumed based on the information provided in the Project Start Date, Project Duration and Project Completion Date columns.

Ongoing: Active project work is taking place; project is active at the time of preparation of this table. Where available, information on specific work that is ongoing for the project has been included.

Unknown: Information or project details were not publicly available, or it was not possible to determine the required details based on the information available at the time of preparation of this table.

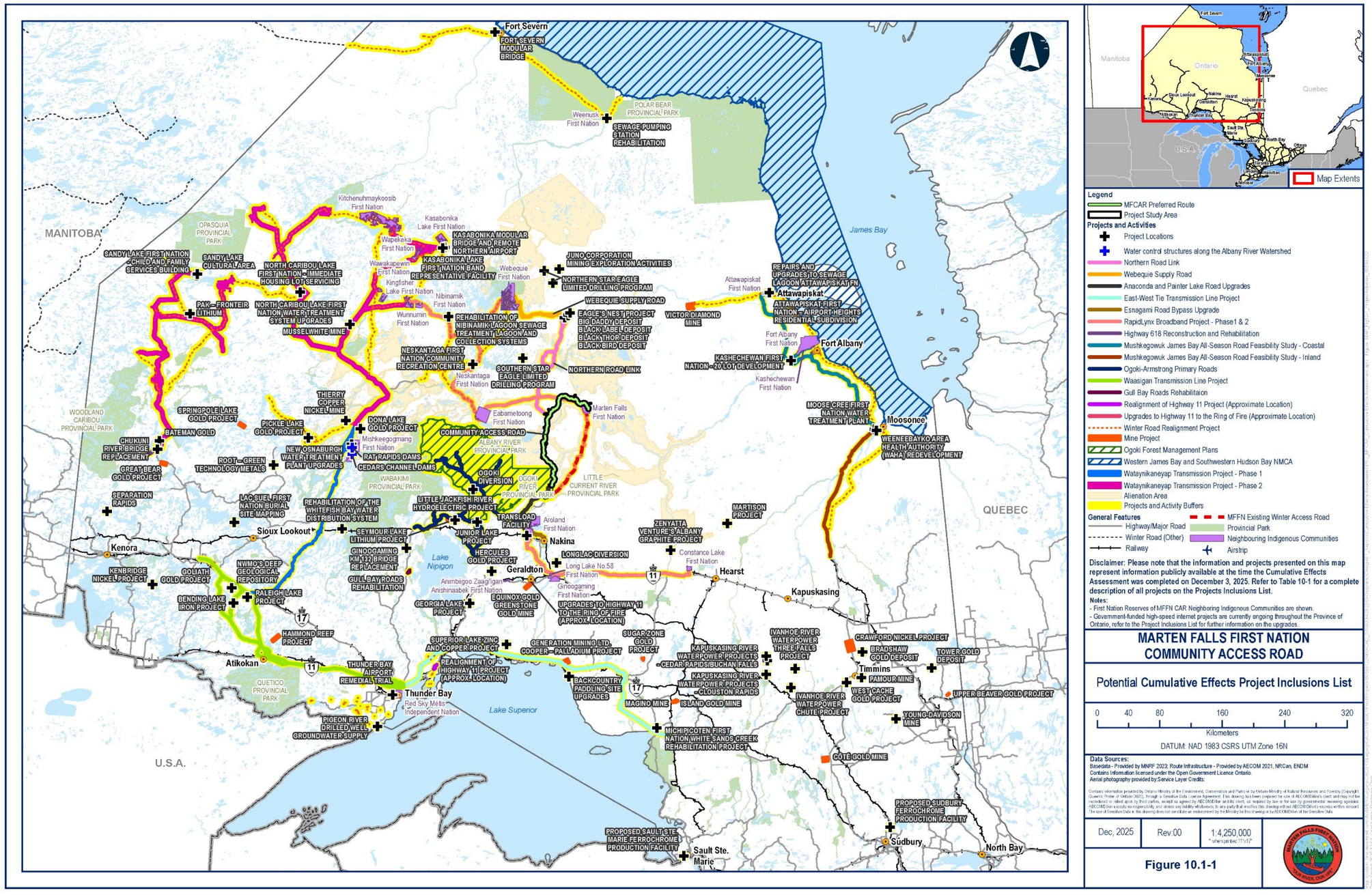
On Hold: Project has been put on pause for various reasons, currently no active project work.

Not Active / Not Applicable: Applies to non-active projects and are not included as part of the Cumulative Effects Assessment (locations of First Nations communities, mineral deposits, and so forth).

Operation: Construction is complete on the project and project is currently in use / active.

Decommissioning / Rehabilitation: Applies to mining projects only. Refers to activities following operations to rehabilitate the land.

Figure 10.1-1: Potential Cumulative Effects Project Inclusions List



10.2 Water

10.2.1 Scoping

Where residual effects identified in **Section 9** were of negligible magnitude, unlikely or possible to occur, or positive in direction, the effect was not carried forward into the Cumulative Effects Assessment. The valued components with residual effects that have been carried forward for the Cumulative Effects Assessment for water disciplines are described in **Table 10.2-1**.

To determine the spatial boundaries of potential cumulative effects, the projects listed in **Table 10.2-2** were considered for the Cumulative Effects Assessment. The remainder of the projects on the Project Inclusions List were determined to have no spatial or temporal overlap with water disciplines study areas; therefore, they were not considered as part of the Cumulative Effects Assessment.

Table 10.2-1: Valued Components Carried Forward and Corresponding Spatial and Temporal Boundary for Water Disciplines

Discipline	Valued Component	Spatial Boundary	Temporal Boundary
• **Surface Water**	• Surface Water Quantity • Surface Water Quality • Sediment Quality	• Includes the three tertiary watersheds (4GD Upper Albany - Makokibatan, 4GE Lower Ogoki, and 4GF Upper Albany - Muswabik) that are intersected by the centreline of the Preferred Route. • The Regional Study Area was extended to include areas where the Local Study Area falls outside of these tertiary watersheds. Tertiary watersheds are based on the federal “Drainage Area” reporting framework and represent third level subdivisions of Canada into suitably sized areas based on drainage for administrative purposes (Ministry of Natural Resources and Forestry, 2015).	• Construction
• **Fish and Fish Habitat**	• Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot	• Includes the three tertiary watersheds (4GD Upper Albany - Makokibatan, 4GE Lower Ogoki, and 4GF Upper Albany - Muswabik) that are intersected by the centreline of the Preferred Route. • The Regional Study Area was extended to include areas where the Local Study Area falls outside of these tertiary watersheds. Tertiary watersheds are based on the federal “Drainage Area” reporting framework and represent third level subdivisions of Canada into suitably sized areas based on drainage for administrative purposes (Ministry of Natural Resources and Forestry, 2015).	• Construction • Operations
• **Groundwater and Geochemistry**	• Groundwater	• 2.5 kilometres from centreline of the Preferred Route and associated construction areas.	• Construction • Operations
• **Peatlands**	• Direct peatland loss • Changes to groundwater • Fragmentation and edge effects • Fugitive dust emissions	• Includes quaternary watersheds that overlap with the peatlands existing conditions Local Study Area.	• Construction • Operations

Table 10.2-2: Project and Physical Activities Carried Forward for Water Disciplines

Discipline(s)	Project	Project Description	Project / Activity Reasonably Foreseeable (Yes / No)	Valued Components Temporal Overlap with Project (Yes / No)	Valued Components Spatial Overlap with Project (Yes / No)
• **Surface Water** • **Fish and Fish Habitat** • **Groundwater and Geochemistry** • **Peatlands**	• Northern Road Link	• Marten Falls First Nation and Webequie First Nation are proposing to build, operate and maintain an all-season multi-use road and associated infrastructure between the Community Access Road that has been proposed by Marten Falls First Nation and the supply road that has been proposed by Webequie First Nation. • Terms of Reference for the preparation of an Environmental Assessment were approved March 3, 2023.	• Yes	• Yes	• Local Study Area - Yes • Regional Study Area - Yes
• **Surface Water** • **Fish and Fish Habitat** • **Groundwater and Geochemistry** • **Peatlands**	• Anaconda and Painter Lake Forestry Access Road Upgrades	• Upgrades to existing road will be required for heavy vehicles accessing the Community Access Road route during construction and operations. • Currently discussions on proponency and scope of work are underway. • Potential scope of work is expected to include roadway widening, culvert and bridge replacements / rehabilitations to accommodate higher weight vehicles, and road base improvements. • This project will be completed prior to the start of the construction of the Community Access Road; therefore, the upgrade to these roads is not expected to overlap with the construction of the Community Access Road.	• Yes	• Yes	• Local Study Area - Yes • Regional Study Area - Yes
• **Surface Water** • **Fish and Fish Habitat** • **Groundwater and Geochemistry** • **Peatlands**	• Rapid Lynx Broadband	• Approximately 810 kilometres of fibre-optic cables, providing reliable high-speed internet service to five Matawa First Nation communities: Eabametoong, Marten Falls, Neskantaga, Nibinamik, and Webequie with an interconnection at Aroland.	• Yes	• Yes	• Local Study Area - Yes • Regional Study Area - Yes
• **Surface Water** • **Fish and Fish Habitat** • **Peatlands**	• Ogoki Forest Management Plans	• Forest Management Plans for the Ogoki Forest. • Includes Ogoki-Armstrong Primary Roads as these roads are being used for forest management. • Includes plans for future harvest. • Ogoki Forest is approximately 10,900 square kilometres in size and includes approximately 9,798 square kilometres of forested area. • Majority of the forest is traditional territory and is subject to forest management planning and forest management operations.	• Yes	• Yes	• Local Study Area - Yes • Regional Study Area - Yes
• **Surface Water** • **Fish and Fish Habitat**	• Winter Access Road Realignment Project	• Funding to remote northern communities for projects involving installation of water crossing infrastructure, such as pre-engineered bridges and culverts, and repairs to existing structures. • Funding for approximately 3,200 kilometres of winter access roads in Northern Ontario.	• Yes	• Yes	• Local Study Area - Yes • Regional Study Area - Yes

10.2.2 Surface Water

Three valued components with residual effects were carried forward to the Cumulative Effects Assessment:

- Surface water quantity;
- Surface water quality; and
- Sediment quality.

The locations of the projects considered for the Cumulative Effects Assessment in relation to the surface water Regional Study Area are shown on **Figure 10.2-1**.

10.2.2.1 Surface Water Quantity

The Northern Road Link and Rapid Lynx Broadband project, along with the Community Access Road, have the potential for cumulative effects on surface water quantity from short-term water taking and discharges during construction. No road construction is expected as part of the Rapid Lynx Broadband project, but water-taking activities as part of that project may still be required for drilling activities.

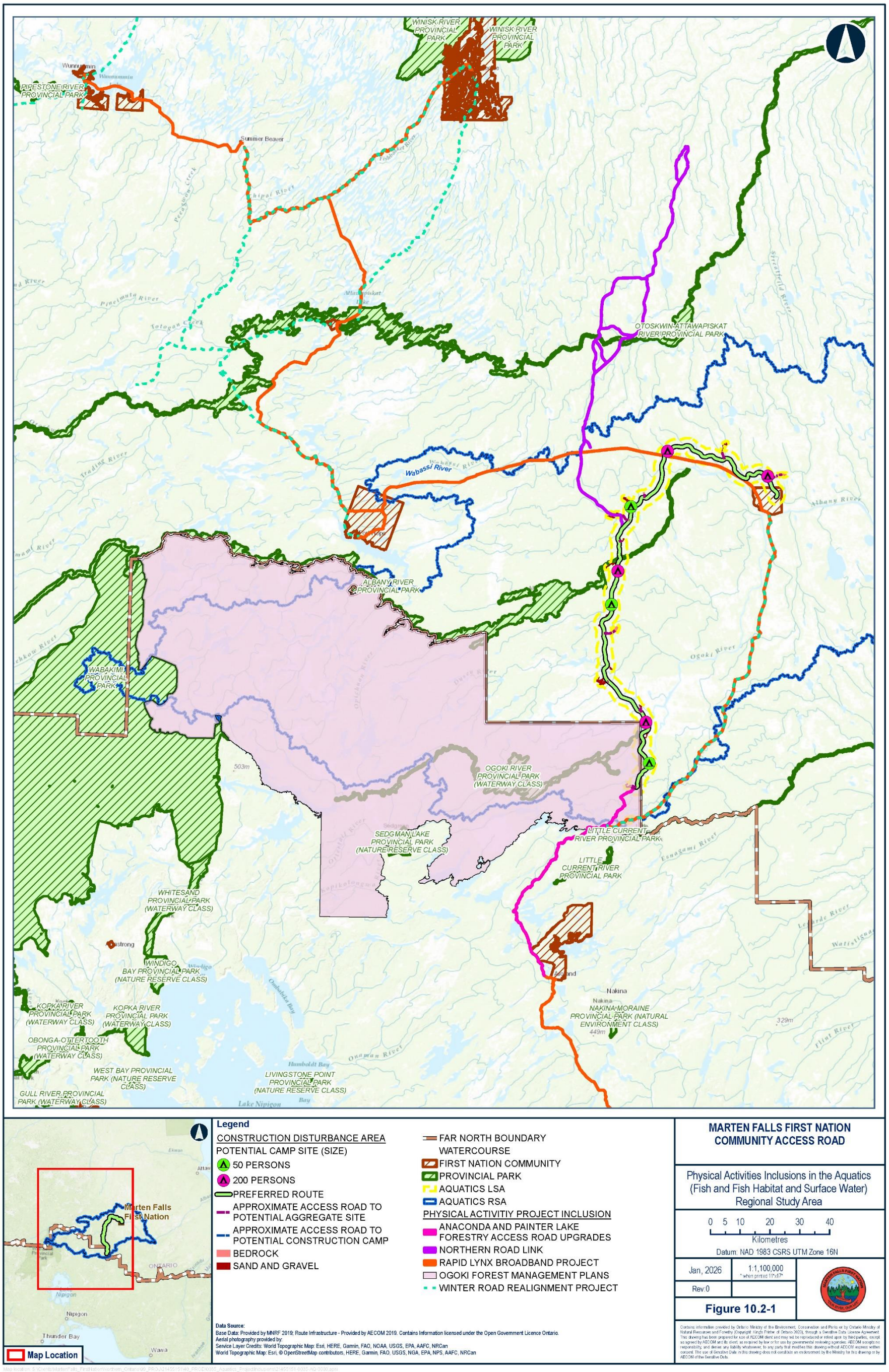
Short-term water takings during construction of the Community Access Road may affect surface water quantity including reductions in streamflows and / or water levels at nearby waterbodies, which are also crossed by the Northern Road Link (Gourlie Creek and Wabassi River).

Cumulative effects from short-term water takings and discharges have the potential to occur because work conducted at the same two crossing locations that are spatially close to one another as part of the Community Access Road and the Northern Road Link. However, the effects from each project for short-term water takings for the purpose of construction would be expected to be localized to the selected water-taking locations (for example, surface water locations) and to result in minimal change to overall surface water quantity reporting back into the receiving systems.

10.2.2.2 Surface Water Quality

Impacts to surface water quality (increase to the concentrations of suspended solids and chemical constituents in receiving waterbodies) are predicted to occur as a result of short-term water discharges or diversions, and wash-off of organic debris to nearby waterbodies, and / or increased rates of erosion in disturbed and exposed areas with sediment transport and delivery to adjacent waterbodies during construction of the Community Access Road and the Northern Road Link.

Figure 10.2-1: Physical Activities Inclusions in the Aquatics (Fish and Fish Habitat and Surface Water) Regional Study Area



Cumulative effects from short-term discharges have the potential to occur because work may be conducted at water crossing locations where the Community Access Road and Northern Road Link overlap spatially; however, are expected to be localized to the selected water-taking locations (for example, surface water locations) and to result in minimal change to overall surface water quality reporting back into the receiving systems.

The use of short-term water diversions to create and maintain a dewatered area to support installation of temporary and permanent waterbody crossings and removal of temporary waterbody crossing structures, may result in a measurable increase or reduction in streamflows, water levels, and erosion sedimentation processes at discrete locations upstream or downstream of the waterbody crossing. This has the potential to result in an increase to the concentrations of suspended solids and chemical constituents in waterbodies during these short-term water diversions. However, these impacts are also localized to crossing locations and construction areas.

10.2.2.3 Sediment Quality

The construction of the Northern Road Link and Rapid Lynx Broadband project, along with the Community Access Road, have the potential for cumulative effects on sediment quality from the wash-off of organic debris to nearby waterbodies, and / or increased rates of erosion in disturbed and exposed areas with sediment transport and delivery to adjacent waterbodies during construction.

Measurable changes to sediment quality may occur as part of site preparation, earthworks, and / or stockpiling activities as part of the Northern Road Link, Rapid Lynx Broadband and the Community Access Road; however, the predicted cumulative effects are negligible and are not anticipated to be greater than the predicted residual effects.

10.2.2.4 Mitigation Measures

It is anticipated that mitigation and enhancement measures will be, or have been, implemented to limit the effects of short-term water takings during the construction of the Northern Road Link and Rapid Lynx Broadband project and that these mitigation and enhancement measures will be similar to those implemented for the Community Access Road. Refer to **Section 9.3.2** for a complete description of the proposed mitigation measures for surface water.

As a best practice, it is suggested that monitoring programs of the Community Access Road for existing and future physical activities / project works share relevant monitoring data for areas where predicted effects may overlap, as well as share the timing of such

construction activities. Additional timing and monitoring data of related works, such as short-term water takings or discharges, should be shared between projects as these potential impacts to surface water quantity, surface water quality and sediment quality could lead to compounding cumulative effects if the works occur during the same construction periods in the same spatial overlapping project areas.

10.2.2.5 Determination of Significance

Significance was determined only for disciplines where it was required to meet federal or provincial requirements. For the purposes of this Cumulative Effects Assessment, significance of the effects for surface water was not determined.

10.2.3 Fish and Fish Habitat

Two valued components with residual effects were carried forward to the Cumulative Effects Assessment:

- Changes to fish habitat quantity and quality through physical alteration of waterbodies where work is below the high-water mark; and
- Changes to fish survival and reproduction from improved public access to recreational angling areas.

The locations of the projects considered for the Cumulative Effects Assessment in relation to the fish and fish habitat Regional Study Area are shown on **Figure 10.2-1**.

10.2.3.1 Fish Habitat Quantity and Quality

Direct habitat effects can include alteration or loss of specific habitat features, such as pools, aquatic vegetation, and bed materials that ultimately lead to loss or impairment of habitat functions, including overwintering, spawning, and rearing habitat for fish or lower trophic levels. These direct habitat effects may result in changes in the food supply, which may be reflected in altered fish community structure and productivity.

The effects from Northern Road Link, Anaconda and Painter Lake Forestry Access Road upgrades, Rapid Lynx Broadband, and Winter Access Road Realignment projects on fish habitat quantity and quality from physical alterations would be expected to be localized to crossing locations and have limited potential for cumulative effects on the populations of valued component fish species.

Habitat of the valued component fish species (Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot) is anticipated to remain stable and

functional, but there may be a minor decrease in productivity from physical alteration of the waterbodies. However, the valued component fish species populations are anticipated to remain self-sustaining and ecologically effective.

10.2.3.2 Fish Habitat Survival and Reproduction

Improved public access to recreational angling areas from construction and operations of the Community Access Road, Northern Road Link, and Anaconda and Painter Lake Forestry Access Road upgrades can affect fish survival and reproduction by increasing harvest pressure from recreational anglers, small communities close to the Community Access Road, construction workers while onsite, and increased introduction or spread of invasive species and pathogens from the increased access and harvest pressure. However, the region will remain relatively remote with the nearest urban centre (Thunder Bay) being over 430 kilometres from Marten Falls, and a large influx of recreational anglers is not expected. The Winter Access Road Realignment Project involves upgrades to the existing winter access road, and as such, would not change the existing access to the area.

Northern Road Link and Rapid Lynx Broadband project include crossings that are on the same waterbodies as the Community Access Road (Wabassi River, Buffaloskin River, Albany River, Gourlie Creek, and two unnamed waterbodies). Due to the distance separating the crossings on the Wabassi and Albany rivers, these likely involve different fish populations and any effects on valued component fish populations related to fish harvest at these locations would not be expected to overlap cumulatively. For the Buffaloskin River, Gourlie Creek, and the two unnamed waterbodies, a substantial increase in harvest pressure would not be expected due to the remoteness of the sites as it would likely remain the same local fishers who would access these locations currently.

Although the Anaconda and Painter Lake Forestry Access Road upgrades will provide access to the south end of the Community Access Road in the Lower Ogoki watershed, there are no waterbodies on the Anaconda and Painter Lake Forestry Access Road that are also crossed by the Community Access Road, and therefore are not expected to interact cumulatively with the Community Access Road to increase fish harvest beyond what has already been predicted for the Community Access Road.

10.2.3.3 Mitigation Measures

It is anticipated that mitigation and enhancement measures will be, or have been, implemented to limit habitat loss and alteration during the construction of the projects, as well as limit increased access and harvest pressure and associated potential for

introduction or spread of invasive species or pathogens during construction and operations. It is anticipated that these mitigation and enhancement measures will be similar to those implemented for the Community Access Road. Refer to **Section 9.3.3** for a complete description of the proposed mitigation measures for fish and fish habitat.

These projects will also be required to meet permitting requirements from the Ministry of Natural Resources and Fisheries and Oceans Canada.

10.2.3.4 Determination of Significance

Overall, the valued component fish populations are expected to remain to be self-sustaining and ecologically effective; therefore, the predicted cumulative effects on fish and fish habitat are assessed as **not significant**. Based on the Cumulative Effects Assessment, the characterization of cumulative effects was considered to be the same as the residual effects characterization for both interactions carried forward. The magnitude of the predicted cumulative effects remained low for changes to fish habitat quantity and quality through physical alteration from work below the high-water mark and medium for changes to fish survival and reproduction from improved public access to recreational angling areas.

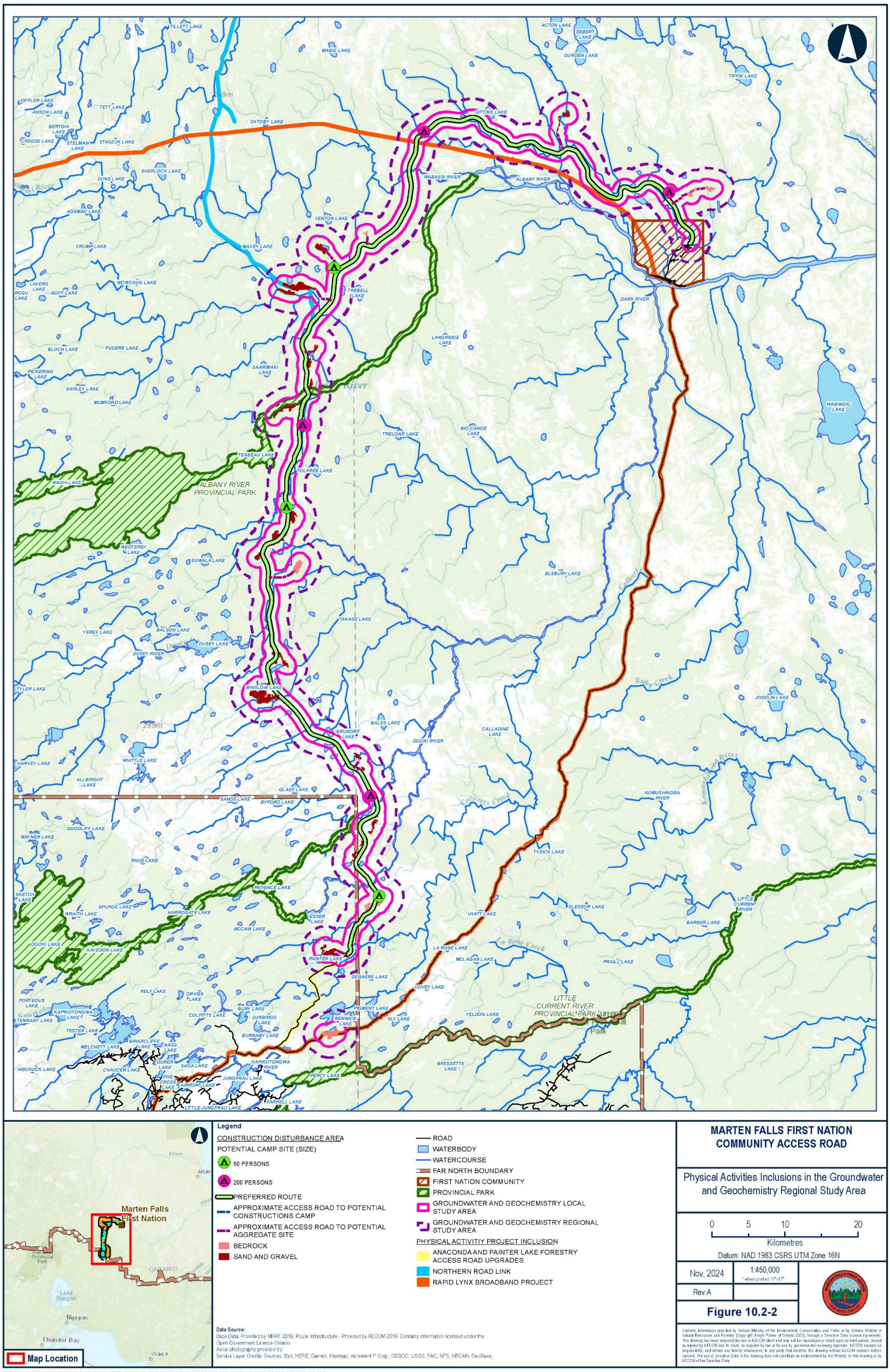
10.2.4 Groundwater and Geochemistry

Five valued components with residual effects were carried forward to the groundwater and geochemistry Cumulative Effects Assessment:

- Changes to groundwater quantity due to pit or quarry dewatering;
- Changes to groundwater quantity valued component due to road construction in peatland areas;
- Changes to groundwater quality valued component due to construction wastes and wastewater discharges;
- Changes to groundwater quality valued component due to blasting residues; and
- Changes to groundwater quality valued component due to road maintenance.

The locations of the projects considered for the Cumulative Effects Assessment in relation to the groundwater Regional Study Area are shown on **Figure 10.2-2**.

Figure 10.2-2: Physical Activities Inclusions in the Groundwater and Geochemistry Regional Study Area



10.2.4.1 Changes to Groundwater Quantity due to Pit or Quarry Dewatering

It is expected that the sizes and numbers of aggregate pits and quarries used for the Northern Road Link and Anaconda and Painter Lake Forestry Access Road upgrades would be similar to or slightly less than those required for the Community Access Road and that, there would not be any additional aggregate pits or quarries required where the projects overlap. This means that there would not be any additional cumulative changes to groundwater quantity due to pit or quarry dewatering in the areas of spatial or temporal overlap.

There is no aggregate pit or quarry dewatering expected as part of the Rapid Lynx Broadband project and therefore no changes to groundwater quantity due to pit or quarry dewatering cumulative effects are assessed for this project.

10.2.4.2 Changes to Groundwater Quantity Due to Road Construction in Peatland Areas

The road projects would not be expected to cross the same peatland area in more than one location with the possible exception of the junction between the Community Access Road and the Northern Road Link. Therefore, it is not expected that there would be any additional cumulative changes to groundwater quantity due to road construction in peatland areas in the areas of spatial or temporal overlap.

There is no road construction expected as part of the Rapid Lynx Broadband project, and installation for the project is not expected to overlap temporally with Community Access Road construction; therefore, no cumulative effects are expected.

10.2.4.3 Changes to Groundwater Quality Due to Construction Waste and Wastewater Discharges

It is expected that the potential amounts of waste and wastewater discharges for the Northern Road Link and Anaconda and Painter Lake Forestry Access Road upgrades would be similar to or slightly less than those required for the Community Access Road and that, there would not be any additional waste or wastewater discharges where the projects overlap. Therefore, there are no additional expected cumulative changes to groundwater quality due to construction waste and wastewater discharges in the areas of spatial or temporal overlap.

There is no construction waste or wastewater discharges expected as part of the Rapid Lynx Broadband project and therefore no changes to groundwater quality due to construction waste and wastewater discharges cumulative effects are assessed for this project.

10.2.4.4 Changes to Groundwater Quality Due to Blasting Residues

It is expected that the potential amounts of blasting and generation of blasting residues for the Northern Road Link and Anaconda and Painter Lake Forestry Access Road upgrades would be similar to or less than those required for the Community Access Road and that there would only be a limited potential for additional blasting residue effects in the area where the Northern Road Link and the Community Access Road overlap spatially. Therefore, there may be additional cumulative effects on groundwater quality due to blasting residues in the area of spatial and temporal overlap between the Community Access Road and the Northern Road Link if both are constructed at the same time.

Other spatial and temporal overlaps between the Community Access Road, Northern Road Link, and Anaconda and Painter Lake Forestry Access Road upgrades would not be expected to result in any additional cumulative effects greater than the residual effects of the respective projects.

There is no blasting and therefore no blasting residues expected as part of the Rapid Lynx Broadband project based on available information and therefore no changes to groundwater quality due to blasting residues cumulative effects are assessed for this project.

10.2.4.5 Changes to Groundwater Quality Due to Road Maintenance

It is possible that there would be potential for additional road maintenance effects in the area where the Northern Road Link and the Community Access Road would meet, and an increased concentration of road maintenance chemicals used at that intersection point. Therefore, there would be potential for additional cumulative effects on groundwater quality due to road maintenance activities in that area.

Other spatial overlaps between the Community Access Road, Northern Road Link, and Anaconda and Painter Lake Forestry Access Road upgrades would not be expected to result in any additional cumulative effects greater than the residual effects of the respective projects.

There is no road maintenance or similar activities expected as part of the Rapid Lynx Broadband project based on available information and therefore no changes to groundwater quality due to road maintenance cumulative effects are assessed for this project.

10.2.4.6 Mitigation Measures

No additional mitigation measures are proposed for changes to groundwater and geochemistry. Based on the assessment above, the predicted cumulative effects are not greater than the predicted residual effects for the Community Access Road. It is assumed that the Northern Road Link and Anaconda and Painter Lake Forestry Access Road upgrades will have mitigation plans comparable to the Community Access Road in place during their construction and operation. Refer to **Section 9.3.4** for a complete description of the proposed mitigation measures for groundwater and geochemistry.

As a best practice, it is suggested that the monitoring programs of the Community Access Road and any past, existing, and future physical activities / projects share relevant monitoring data for areas where predicted effects may overlap.

10.2.4.7 Determination of Significance

Significance was determined only for disciplines where it was required to meet federal or provincial requirements. For the purposes of this Cumulative Effects Assessment, significance of the effects for groundwater and geochemistry was not determined.

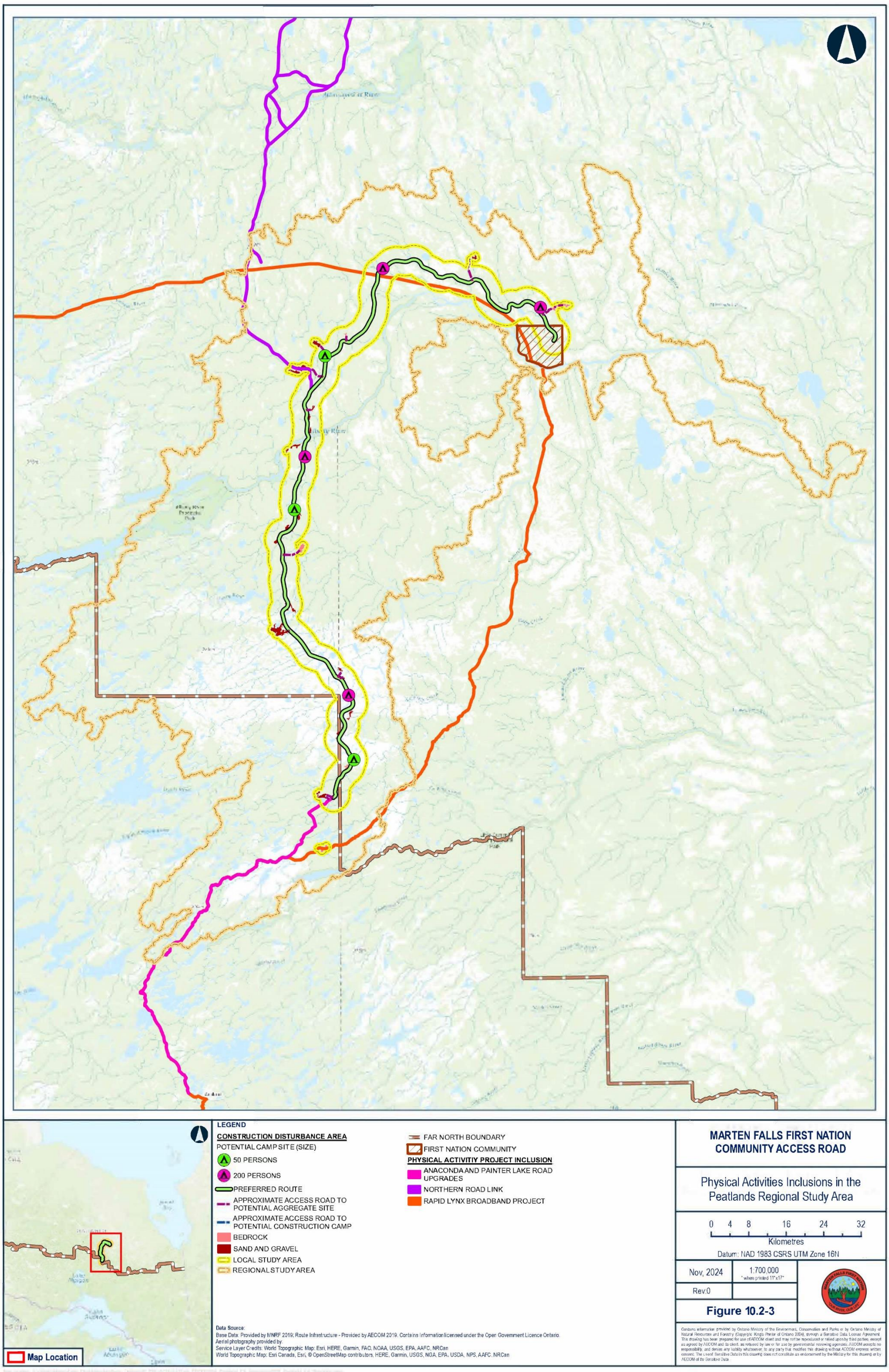
10.2.5 Peatlands

Four valued components with residual effects were carried forward to the peatlands Cumulative Effects Assessment:

- Direct peatland loss;
- Changes to groundwater;
- Fragmentation and edge effects; and
- Fugitive dust emissions.

The locations of the projects considered for the Cumulative Effects Assessment in relation to the peatlands Regional Study Area are shown on **Figure 10.2-3**.

Figure 10.2-3: Physical Activities Inclusions in the Peatlands Regional Study Area



10.2.5.1 Direct Peatland Loss

Past, present, and reasonably foreseeable activities including a 100-metre buffer are predicted to remove a combined 4,532.5 hectares of peatland. This is expected to increase the percentage of peatland loss in the peatlands effects assessment Regional Study Area from 0.3 percent (for the Community Access Road only) to 0.7 percent, as shown on **Table 10.2-3**.

Table 10.2-3: Peatland Loss in the Peatlands Effects Assessment Regional Study Area

Peatland Type	Peatlands Effects Assessment Regional Study Area (Footnote a)		
	Existing Conditions Area (hectares)	Area of Peatland Loss (hectares)	Percent Change (percent)
Bog	157,240.2	338.7	0.2%
Fen	219,950.5	1,886.9	0.9%
Organic Swamp	242,363	2,261.2	0.9%
Organic Marsh	3,875.3	45.7	1.2%
Total	**623,429**	**4,532.5**	**0.7%**

Footnotes: (a) Wetland area values within the Regional Study Area represent a combination of area values from delineated peatland communities completed for the Community Access Road within the existing conditions Local Study Area, and Ontario Land Cover Compilation Version 2.0 mapping for areas beyond the limits of the existing conditions Local Study Area. The Ontario Land Cover Compilation layer is a compilation of Far North Land Cover Version 1.4, Southern Ontario Land Resource Information System Version 1.2, and Provincial Land Cover 2000 Edition. The Ontario Land Cover mapping does not differentiate between organic and mineral wetland communities. Therefore, the wetland area values may be an overestimation.

10.2.5.2 Changes in Groundwater in Peatlands

The Community Access Road, Northern Road Link, and Anaconda and Painter Lake Forestry Access Road upgrades may cause alterations to groundwater quality, drainage patterns, recharge rates and increased or decreased groundwater levels due to activities such as road construction through peatlands, changes to topography, short-term water-taking, pit / quarry dewatering, and discharge of water.

No additional pits or quarries are expected to be required where the projects overlap. Therefore, no additional cumulative changes to groundwater quantity due to pit or quarry dewatering in peatland areas of spatial or temporal overlap between the reasonably foreseeable activities.

The projects are not expected to cross the same groundwater catchment area in more than one location, with the possible exception of the junction between the Community

Access Road and the Northern Road Link. Therefore, no additional cumulative changes to groundwater quantity are expected due to road construction in peatland areas.

The Rapid Lynx Broadband project is anticipated to be buried approximately 1 metre underground and underneath waterbodies, only temporary and minimal changes in groundwater are expected during construction. Any peatlands effects from changes in groundwater would be expected to be local and short-term and would not be expected to overlap temporally with construction.

It should be noted that changes to groundwater can cause changes to soils and vegetation health / composition thereby changing the composition and function of retained peatland communities. If changes to groundwater regimes are sufficient to change the composition of a peatland community, then the availability, distribution, composition, and function of that altered peatland community type will also eventually be affected within the effects assessment Regional Study Area. These indirect effects are difficult to quantify as they largely depend on the effectiveness of the mitigation measures that are implemented.

10.2.5.3 Fragmentation of Edge Effects

The Community Access Road, Northern Road Link, Anaconda and Painter Lake Forestry Access Road upgrades, and Rapid Lynx Broadband project will create new linear corridors for at least some portion of their alignments and therefore introduce new fragmentation and edge effects on the landscape.

This will result in an additional 3,559.7 hectares of disturbance within the effects assessment Regional Study Area and the Community Access Road effects assessment Construction Disturbance Area footprint, that is, 4,700.2 hectares, and therefore are predicted to be cumulative residual effects on the availability, distribution, composition, and function of peatland ecosystems.

Climate change may have additional negative effects on the availability, distribution, composition and function of peatland ecosystems, although these effects are expected to occur even in the absence of further fragmentation and edge effects.

10.2.5.4 Fugitive Dust Emissions

The Community Access Road, Northern Road Link, Anaconda and Painter Lake Forestry Access Road upgrades, and Rapid Lynx Broadband project are predicted to result in fugitive dust emissions. Dust accumulation may locally and directly impact peatland vegetation by smothering plant tissues, hindering gas exchange, and reducing photosynthesis by blocking sunlight (Hirano et al., 1995; Prajapati, 2012).

Measurable changes to the availability, distribution, function, and composition of peatland ecosystems may occur from increased fugitive dust emissions associated with the Community Access Road, Northern Road Link, Anaconda and Painter Lake Forestry Access Road upgrades, and Rapid Lynx Broadband project within the effects assessment Regional Study Area.

10.2.5.5 Mitigation Measures

It is anticipated that the mitigation measures that will be implemented to minimize impacts to peatlands during the construction of the Northern Road Link, Anaconda and Painter Lake Forestry Access Road upgrades, and Rapid Lynx Broadband project will be similar to those implemented for the Community Access Road. No additional mitigation measures are proposed to further mitigate cumulative effects. Refer to **Section 9.3.5** for a complete description of the proposed mitigation measures for peatlands.

It is expected that the effectiveness of mitigation measures for these activities, including the Community Access Road, will be evaluated throughout construction and operation, and will be modified or enhanced as necessary through adaptive management.

As a best practice, it is suggested that the monitoring programs of the Community Access Road and any reasonably foreseeable developments share relevant monitoring data for areas where predicted effects may overlap.

10.2.5.6 Determination of Significance

Peatland ecosystems are expected to remain abundant, intact, and well distributed across the effects assessment Regional Study Area; however, this is dependent on the success of the proposed mitigations, including the implementation of the “floating road” construction technique for crossing peatland ecosystems. While it is predicted that the contribution of the Community Access Road and other reasonably foreseeable developments to cumulative residual effects on peatland ecosystems in the effects assessment Regional Study Area is not expected to change the self-sustaining and ecologically effective status of peatland ecosystems, there is still a high level of uncertainty surrounding the Community Access Road’s cumulative residual effect on peatland ecosystems resulting from changes to groundwater.

As a result, a precautionary approach has been applied and cumulative residual effects on peatland ecosystems are predicted to be **significant**.

10.2.6 Summary of Cumulative Effects

Table 10.2-4 summarizes the cumulative effects for the water disciplines.

Table 10.2-4: Summary of Predicted Cumulative Effects for Water Disciplines

Discipline	Valued Component	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Probability of Occurrence	Significance (Significant, Not Significant)	Uncertainty
• **Surface Water**	• Surface Water Quantity	• Residual changes to surface water quantity from short-term water taking	• Negative	• Negligible	• Local Study Area	• Short-term	• Frequent	• Reversible	• Probable	• Not Significant	• Moderate
• **Surface Water**	• Surface Water Quantity, Surface Water Quality. Sediment Quality	• Residual changes to surface water quantity, surface water quality, and sediment quality from short-term water discharges	• Negative	• Negligible	• Local Study Areal	• Short-term	• Frequent	• Reversible	• Probable	• Not Significant	• Moderate
• **Surface Water**	• Surface Water Quantity, Surface Water Quality. Sediment Quality	• Residual changes to surface water quantity, surface water quality, and sediment quality during short-term water diversions at waterbody crossings	• Negative	• Negligible	• Construction Disturbance Area	• Short-term	• Infrequent	• Reversible	• Probable	• Not Significant	• Moderate
• **Surface Water**	• Surface Water Quantity, Surface Water Quality. Sediment Quality	• Residual changes to surface water quantity, surface water quality, and sediment quality due to changes in land cover	• Negative	• Negligible	• Construction Disturbance Area	• Long-term	• Frequent	• Irreversible for permanent structures	• Probable	• Not Significant	• Moderate
• **Surface Water**	• Surface Water Quantity, Surface Water Quality. Sediment Quality	• Residual changes to surface water quality and sediment quality from the wash-off of organic debris to nearby waterbodies, and / or increased rates of erosion in disturbed and exposed areas with sediment transport and delivery to adjacent waterbodies	• Negative	• Negligible	• Local Study Area	• Short-term	• Frequent	• Reversible	• Probable	• Not Significant	• Moderate
• **Fish and Fish Habitat**	• Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot	• Changes to fish habitat quantity and quality through physical alteration of waterbodies where work is below the high-water mark	• Negative	• Low	• Construction Disturbance Area	• Short- to medium-term for temporary waterbody crossings • Long-term for permanent waterbody crossings	• Infrequent	• Reversible for temporary waterbody crossings • Irreversible for permanent waterbody crossings	• Certain (work below the high-water mark)	• Not Significant	• Moderate

Discipline	Valued Component	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Probability of Occurrence	Significance (Significant, Not Significant)	Uncertainty
• **Fish and Fish Habitat**	• Lake Sturgeon, Walleye, Brook Trout, Northern Pike, Lake Whitefish, and Burbot	• Changes to fish survival and reproduction from improved public access to recreational angling areas	• Negative	• Medium	• Regional	• Long-term	• Frequent	• Irreversible	• Possible	• Not Significant	• Moderate
• **Groundwater and Geochemistry**	• Groundwater	• Changes to groundwater quantity due to pit or quarry dewatering	• Negative	• High	• Local	• Medium-term	• Continuous	• Reversible	• Probable	• Not Applicable	• Moderate
• **Groundwater and Geochemistry**	• Groundwater	• Changes to groundwater quantity due to road construction in peatland areas	• Negative	• Medium	• Local	• Long-term	• Continuous	• Irreversible	• Possible	• Not Applicable	• Moderate
• **Groundwater and Geochemistry**	• Groundwater	• Changes to groundwater quality due to construction wastes and wastewater discharges	• Negative	• Medium	• Local	• Medium-term	• Continuous	• Reversible	• Probable	• Not Applicable	• Moderate
• **Groundwater and Geochemistry**	• Groundwater	• Changes to groundwater quality due to blasting residues	• Negative	• Medium	• Local	• Medium-term	• Frequent	• Reversible	• Certain	• Not Applicable	• Moderate
• **Groundwater and Geochemistry**	• Groundwater	• Changes to groundwater quality due to road maintenance	• Negative	• Medium	• Local	• Long-term	• Continuous	• Irreversible	• Certain	• Not Applicable	• Moderate
• **Peatlands**	• Peatland Ecosystems	• Direct peatland loss	• Negative	• Low	• Regional (reasonably foreseeable developments) • Beyond regional (due to climate change)	• Long-term	• Continuous	• Irreversible (for permanent impacts) • Reversible (for temporary impacts where peatlands will be restored)	• Certain (reasonably foreseeable developments) • Probable (climate change)	• Not significant	• Moderate
• **Peatlands**	• Peatland Ecosystems	• Changes to groundwater	• Negative	• Medium	• Regional	• Long-term	• Continuous	• Irreversible	• Probable	• Significant	• High
• **Peatlands**	• Peatland Ecosystems	• Fragmentation and edge effects	• Negative	• Negligible	• Regional	• Medium-term	• Frequent	• Irreversible	• Probable	• Not significant	• Moderate
• **Peatlands**	• Peatland Ecosystems	• Fugitive dust emissions	• Negative	• Negligible	• Regional	• Long-term	• Continuous	• Irreversible	• Certain	• Not significant	• Moderate

10.3 Land

10.3.1 Scoping

Where residual effects identified in **Section 9** were negligible magnitude, unlikely or possible to occur, or positive in direction, the effect was not carried forward into the Cumulative Effects Assessment. The valued components with residual effects that have been carried forward for the Cumulative Effects Assessment for land disciplines are described in **Table 10.3-1**.

To determine the spatial boundaries of potential cumulative effects, the projects listed in **Table 10.3-2** were considered for the Cumulative Effects Assessment. The remaining projects on the Project Inclusions List were determined to have no spatial or temporal overlap with the land disciplines study areas; therefore, they were not considered as part of the Cumulative Effects Assessment.

Table 10.3-1: Valued Components Carried Forward and Corresponding Spatial and Temporal Boundary for Land Disciplines

Discipline	Valued Component	Spatial Boundary	Temporal Boundary
• **Vegetation**	• Upland Ecosystems • Wetland Ecosystems • Riparian Ecosystems • Designated Areas • Traditional Use Plants • Species at Risk and Species of Conservation Concern	• 11 kilometres buffer on either side of the centreline of the Preferred Route	• Construction • Operations
• **Wildlife**	• Wildlife (non-ungulate, non-bird, non-wolverine)	• 11 kilometres buffer on either side of the Construction Disturbance Area	• Construction • Operations
• **Wildlife**	• Wolverine	• All Wildlife Management Units that intersect with the Construction Disturbance Area	• Construction • Operations
• **Wildlife - Birds**	• Birds	• 11 kilometres buffer on either side of the centreline of the Preferred Route (506,756 hectares)	• Construction • Operations
• **Wildlife - Ungulates**	• Boreal Caribou	• Boreal caribou ranges that are intersected by the Ungulate Local Study Area (Missisa Range, Nipigon Range) and adjacent boreal caribou ranges which may be affected by indirect habitat loss (Ozhiski Range, Pagwachuan range) (19,250,753 hectares)	• Construction • Operations
• **Wildlife - Ungulates**	• Moose	• All Wildlife Management Units that are intersected by the Ungulate Local Study Area (17, 1D, 18A) (16,139,060 hectares)	• Construction • Operations
• **Physiography, Soils and Terrain**	• Physiography, Terrain, and Soils	• Regional Study Area - 11 kilometres buffer on either side of the Community Access Road centreline	• Construction • Operations

Table 10.3-2: Project and Physical Activities Carried Forward for Land Disciplines

Discipline(s)	Project	Project Description	Project / Activity Reasonably Foreseeable (Yes / No)	Valued Components Temporal Overlap with Project (Yes / No)	Valued Components Spatial Overlap with Project (Yes / No)
• **Vegetation** • **Wildlife** • **Wildlife - Birds** • **Wildlife - Ungulates** • **Physiography, Soils and Terrain**	• Northern Road Link	• Marten Falls First Nation and Webequie First Nation are proposing to build, operate and maintain an all-season multi-use road and associated infrastructure between the Community Access Road that has been proposed by Marten Falls First Nation and the supply road that has been proposed by Webequie First Nation. • Terms of Reference for the preparation of an Environmental Assessment were approved March 3, 2023.	• Yes	• Yes	• Yes
• **Vegetation** • **Wildlife** • **Wildlife - Birds** • **Wildlife - Ungulates** • **Physiography, Soils and Terrain**	• Anaconda and Painter Lake Forestry Access Road Upgrades	• Upgrades to existing road will be required for heavy vehicles accessing the Community Access Road route during construction and operations. • Currently discussions on proponency and scope of work are underway. • Potential scope of work is expected to include roadway widening, culvert and bridge replacements / rehabilitations to accommodate higher weight vehicles, and road base improvements. • This project will be completed prior to the start of the construction of the Community Access Road; therefore, the upgrade to these roads is not expected to overlap with the construction of the Community Access Road.	• Yes	• Yes	• Yes
• **Vegetation** • **Wildlife** • **Wildlife - Birds** • **Wildlife - Ungulates** • **Physiography, Soils and Terrain**	• Rapid Lynx Broadband	• Approximately 810 kilometres of fibre-optic cables, providing reliable high-speed internet service to five Matawa First Nation communities: Eabametoong, Marten Falls, Neskantaga, Nibinamik, and Webequie with an interconnection at Aroland.	• Yes	• Yes	• Yes

Discipline(s)	Project	Project Description	Project / Activity Reasonably Foreseeable (Yes / No)	Valued Components Temporal Overlap with Project (Yes / No)	Valued Components Spatial Overlap with Project (Yes / No)
• **Vegetation** • **Wildlife** • **Wildlife - Ungulates**	• Ogoki Forest Management Plans	• Forest Management Plans for the Ogoki Forest. • Includes Ogoki-Armstrong Primary Roads as these roads are being used for forest management. • Includes plans for future harvest. • Ogoki Forest is approximately 10,900 square kilometres in size and includes approximately 9,798 square kilometres of forested area. • Majority of the forest is traditional territory and is subject to forest management planning and forest management operations.	• Yes	• Yes	• Yes
• **Wildlife** • **Wildlife - Ungulates**	• Esnagami Road Bypass Upgrade	• Upgrades to existing road to use as a bypass route around Aroland First Nation settlement area by heavy vehicles accessing the Community Access Road route towards the Ring of Fire. • Currently discussions on proponency and scope of work are underway. • Potential scope of work is expected to include roadway widening, bridge and culvert rehabilitation / replacement, and road base improvements.	• Yes	• Yes	• Yes
• **Wildlife** • **Wildlife - Ungulates**	• Transload Facility	• Rail Transload Facility to Aroland First Nation.	• Yes	• Yes	• Yes
• **Wildlife** • **Wildlife - Ungulates**	• Eagle's Nest Project	• Multi-metal underground mine located near McFaulds Lake. • Mine will produce and supply nickel, copper, platinum and palladium. • Deposit contains approximately 11 million tonnes of resources and is estimated to have an initial mine life of 11 years with possibility for a 9-year extension. • Terms of Reference for the project approved June 18, 2015.	• Yes	• Yes	• Yes
• **Wildlife** • **Wildlife - Ungulates**	• Webequie Supply Road	• New all-season road approximately 107 kilometres in length from Webequie First Nation to the mineral deposit near McFaulds Lake for mineral exploration and future mining development activities. • 17 kilometres of the corridor is within Webequie First Nation Reserve Lands.	• Yes	• Yes	• Yes
• **Wildlife** • **Wildlife - Ungulates**	• Ogoki and Long Lac Diversions	• Divert water from a portion of the Hudson Bay watershed into the Lake Superior basin. • Long Lac diversion inflows approximately 39 cubic metres per second into the Great Lakes Basin. • Ogoki diversion inflows approximately 113 cubic metres per second into the Great Lakes Basin.	• Yes	• Yes	• Yes
• **Wildlife** • **Wildlife - Ungulates**	• Victor Diamond Mine	• Fly-in, fly-out open put diamond mine located near James Bay lowlands of northern Ontario. • Mine in operation from 2008 to 2019; however, now closed and in rehabilitation.	• Yes	• Yes	• Yes
• **Wildlife** • **Wildlife - Ungulates**	• Gull Bay Roads Rehabilitation	• Rehabilitate approximately 10 kilometres of roads in the Gull Bay First Nation in Ontario. • Relocation of the community's entrance and exit to Highway 527; rebuilding the road base and widening certain sections; grading and brush clearing to improve sightlines; addressing drainage issues through ditching and the replacement of an estimated 43 culverts; installing street and traffic control signs (for example street, stop, yield and speed signs plus pedestrian warnings); and resurfacing Main Street and Streets A through M with Granular A along with calcium chloride for dust suppression. • Infrastructure Canada issued its Notice of Determination on July 15, 2021, and determined that the project is not likely to cause significant adverse environmental effects.	• Yes	• Yes	• Yes
• **Wildlife** • **Wildlife - Ungulates**	• Wataynikaneyap Transmission Project	• Construction of a 230 kilovolts line between Ignace and Dryden, to Pickle Lake (Phase 1). • Construction of electricity transmission lines to Pickle Lake and north of Red Lake, connecting 17 remote northern Ontario communities to grid power (Phase 2). • Operation of both project phases overlap with the construction and operations of the Community Access Road.	• Yes	• Yes	• Yes
• **Wildlife** • **Wildlife - Ungulates**	• Kasabonika Lake First Nation Band Representative Facility	• The Kasabonika Lake First Nation Band Representative Facility project involves the construction of a new single-story Child and Family Service building and housing facilities for staff in the community of Kasabonika Lake. • Includes tree clearing, lot development, parking lot and laneway construction, connection to community's water and wastewater infrastructure and building construction.	• Yes	• Yes	• Yes

Discipline(s)	Project	Project Description	Project / Activity Reasonably Foreseeable (Yes / No)	Valued Components Temporal Overlap with Project (Yes / No)	Valued Components Spatial Overlap with Project (Yes / No)
• **Wildlife** • **Wildlife - Ungulates**	• Kashechewan First Nation - 20 Lot Development	• Development of 20 lots with future use to build family homes for the community. • Each lot is roughly 929 metres in size. • The project will include site preparation activities including clearing, grubbing, granular placement, and servicing of lots with municipal utilities and services. • The Notice of Determination was issued on November 17, 2023, and determined that the project is not likely to cause significant adverse environmental effects.	• Yes	• Yes	• Yes
• **Wildlife** • **Wildlife - Ungulates**	• Attawapiskat First Nation - Airport Heights Residential Subdivision	• Lot servicing project, for a maximum of 28 serviced residential lots in the proposed Airport Heights Residential Subdivision.	• Yes	• Yes	• Yes
• **Wildlife** • **Wildlife - Ungulates**	• Neskantaga First Nation Community Recreation Centre	• Renovation of the existing community recreation centre and arena, to include an additional 2,400 square feet in size and will include washrooms.	• Yes	• Yes	• Yes
• **Wildlife** • **Wildlife - Ungulates**	• Rehabilitation of Nibinamik Lagoon Sewage Treatment Lagoon and Collection Systems	• Repair and replacement of components of a sewage lagoon and the purchase of a septic truck in Nibinamik First Nation. • Includes re-excavating and repairing 30 manholes and covers, flushing outflow lines, removing and replacing 2 pressure relief values, repairing damaged section of the lagoon and buying a septic truck.	• Yes	• Yes	• Yes
• **Wildlife** • **Wildlife - Ungulates**	• Mushkegowuk James Bay All-Season Road Coastal and Inland	• New all-season access road connecting 4 western James Bay communities and the Provincial highway network. • Includes 525 kilometres of gravel-surface public highway, 70 bridges and 100 additional medium and large diameter culverts to span watercourses.	• Yes	• Yes	• Yes
• **Wildlife** • **Wildlife - Ungulates**	• Accelerated High-Speed Internet Program	• Providing access to reliable, high-speed internet to unserved and underserved communities across the province by the end of 2025.	• Yes	• Yes	• Yes
• **Wildlife** • **Wildlife - Birds** • **Wildlife - Ungulates** • **Physiography, Soils and Terrain**	• Winter Access Road Realignment Project	• Funding to remote northern communities for projects involving installation of water crossing infrastructure, such as pre-engineered bridges and culverts, and repairs to existing structures. • Funding for approximately 3,200 kilometres of winter access roads in Northern Ontario.	• Yes	• Yes	• Yes
• **Wildlife** • **Wildlife - Ungulates**	• Seymour Lake Lithium Project	• Lithium deposit near Seymour Lake. • First production targeted in 2026.	• Yes	• Yes	• Yes
• **Wildlife** • **Wildlife - Ungulates**	• Juno Corporation Mining Exploration Activities	• Exploration of minerals in the Ring of Fire. • Mineral exploration permit issued in August 2025.	• Yes	• Yes	• Yes
• **Wildlife** • **Wildlife - Ungulates**	• Gull Bay Roads Rehabilitation	• Rehabilitate approximately 10 kilometres of roads in the Gull Bay First Nation in Ontario. • Relocation of the community's entrance and exit to Highway 527; rebuilding the road base and widening certain sections; grading and brush clearing to improve sightlines; addressing drainage issues through ditching and the replacement of an estimated 43 culverts; installing street and traffic control signs (street, stop, yield and speed signs plus pedestrian warnings); and resurfacing Main Street and Streets A through M with Granular A along with calcium chloride for dust suppression. • Infrastructure Ontario issued its Notice of Determination on July 15, 2021, and determined that the project is not likely to cause significant adverse environmental effects.	• Yes	• Yes	• Yes

10.3.2 Vegetation

Four valued components with residual effects were carried forward to the vegetation Cumulative Effects Assessment:

- Direct vegetation loss;
- Changes to groundwater;
- Fragmentation and edge effects; and
- Fugitive dust emissions.

Cumulative effects on vegetation are shown on **Figure 10.3-1** to **Figure 10.3-3**.

10.3.2.1 Direct Vegetation Loss

The Community Access Road, Northern Road Link, Anaconda and Painter Lake Forestry Access Road upgrades, and Rapid Lynx Broadband project are predicted to change the following vegetation availability in the effects assessment Regional Study Area due to direct vegetation loss:

- Removal of a combined 3,140 hectares of Upland Ecosystems, which equates to 3 percent of the Upland Ecosystems within the effects assessment Regional Study Area;
- Removal of 3,921.6 hectares of Wetland Ecosystems, which equates to 1 percent of the Wetland Ecosystems within the effects assessment Regional Study Area;
- Removal of 163.6 hectares of Riparian Ecosystems, which equates to 1 percent of the Riparian Ecosystems within the effects assessment Regional Study Area;
- Remove 5.7 hectares of the Albany River Provincial Park, which equates to less than 1 percent of the total Provincial Park area, and less than 1 percent of the Provincial Park that occurs within the effects assessment Regional Study Area;
- Remove 750.9 hectares of Critical Landform / Vegetation associations, which equates to 1 percent of the Critical Landform / Vegetation associations within the effects assessment Regional Study Area;
- Remove 1,820.2 hectares of suitable habitat for Black Ash, which equates to 5 percent of the suitable habitat available within the effects assessment Local Study Area; and
- Remove 3,520.9 hectares of suitable habitat for Northern Marsh Violet, which equates to 4 percent of the suitable habitat available within the effects assessment Local Study Area.

Figure 10.3-1: Wetland, Upland and Riparian Ecosystems Cumulative Effects

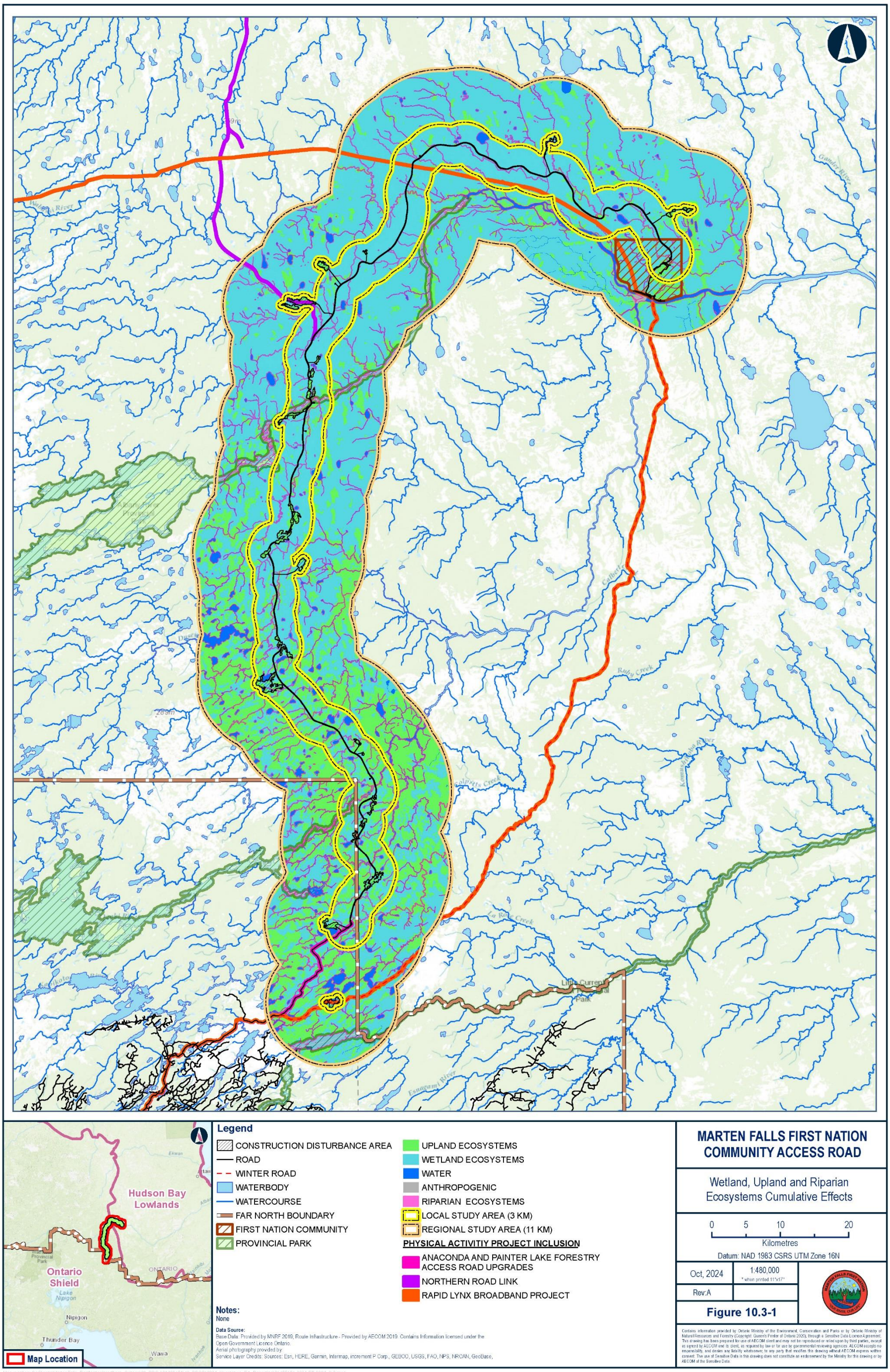


Figure 10.3-2: Traditional Use Plant Habitat Suitability and Accessibility Cumulative Effects

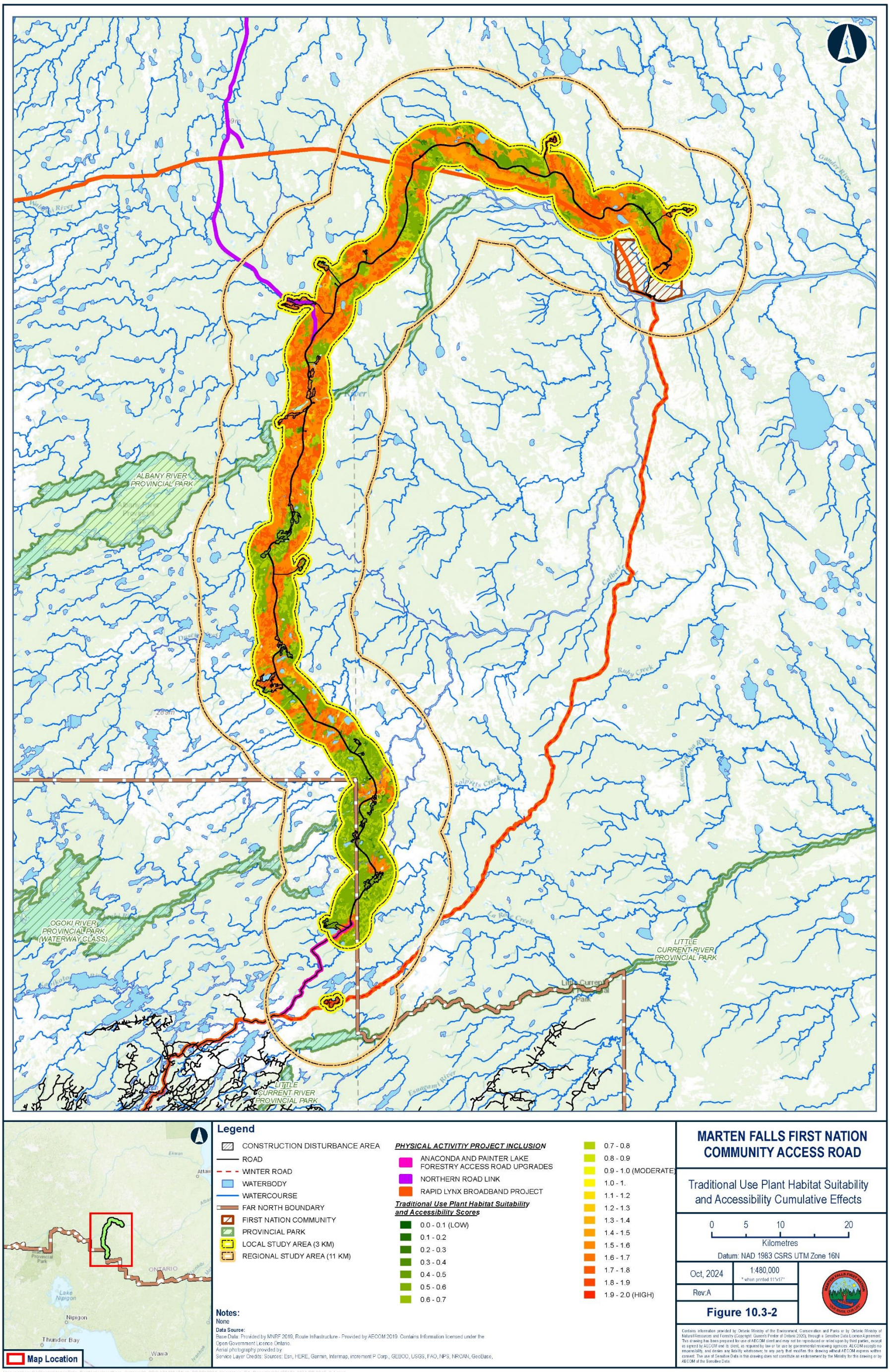
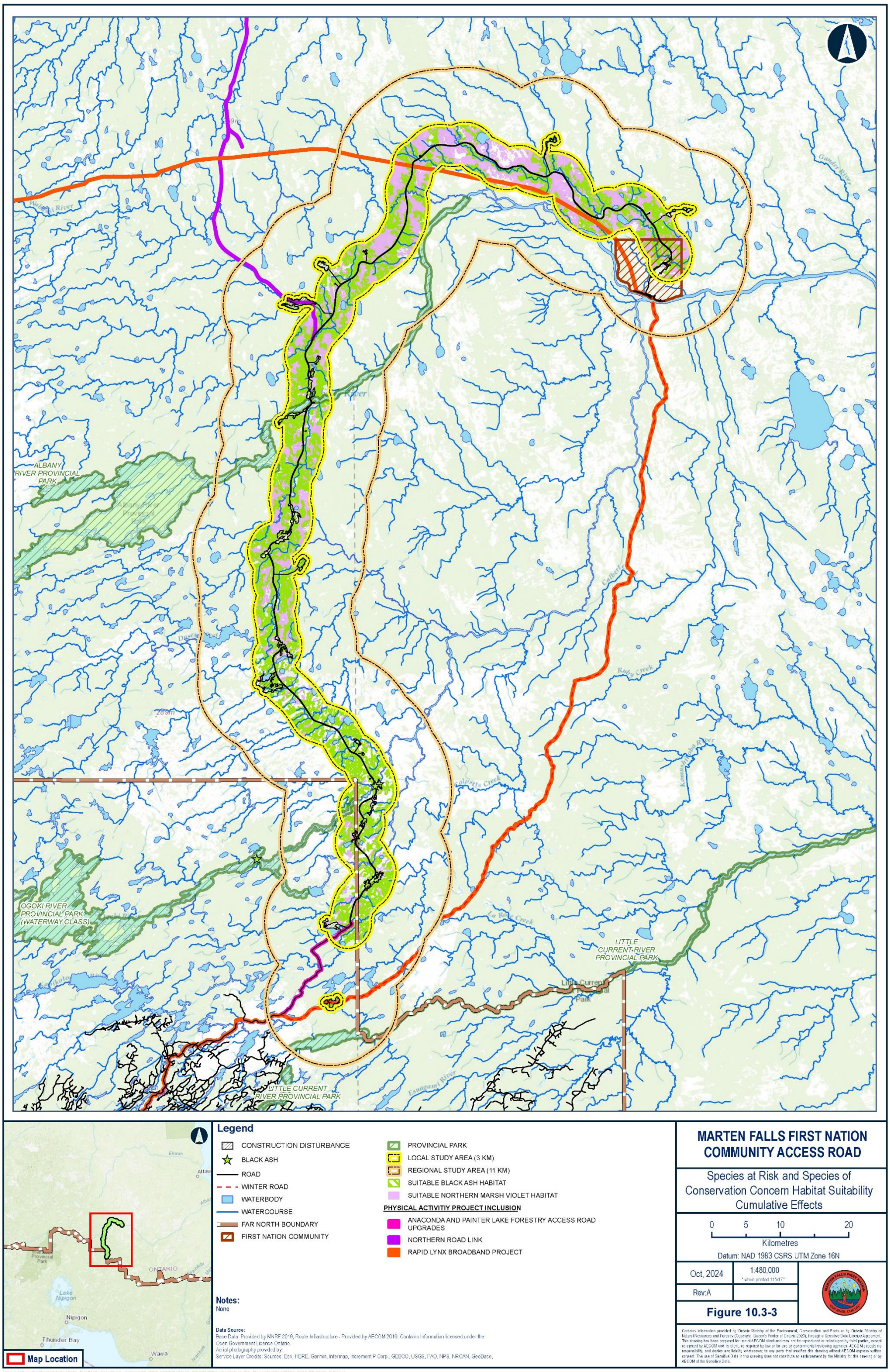


Figure 10.3-3: Species at Risk and Species of Conservation Concern Habitat Suitability Cumulative Effects



Effects from direct vegetation loss from the Northern Road Link, Anaconda and Painter Lake Forestry Access Road upgrades, and Rapid Lynx Broadband projects will begin during construction of the Community Access Road and continue through operations of the Community Access Road.

Climate change has the potential to have negative effects on the availability, distribution, composition and function of vegetation valued components.

However, vegetation valued components are expected to remain abundant, intact, and well distributed across the effects assessment Regional Study Area. The contribution of the Community Access Road and other reasonably foreseeable developments to cumulative residual effects on vegetation valued components in the effects assessment Regional Study Area is not expected to change the self-sustaining and ecologically effective status of vegetation valued components.

10.3.2.2 Changes in Groundwater

The Community Access Road, Northern Road Link, and Anaconda and Painter Lake Forestry Access Road upgrades may cause alterations to drainage patterns, recharge rates, and increased or decreased groundwater levels due to activities such as road construction through wetlands, changes to topography, short-term water-taking, pit / quarry dewatering, and discharge of water.

Due to the predicted similar aggregate requirements and residual effects of the Community Access Road, Northern Road Link, and Anaconda and Painter Lake Forestry Access Road upgrades, it is not expected that there would be any additional pit or quarry development and dewatering in the areas where the projects overlap.

Due to the limited spatial and temporal overlaps of the Community Access Road and reasonably foreseeable developments, it is not generally expected that there would be any additional cumulative effects due to road construction in wetland areas for vegetation valued components.

As the Rapid Lynx Broadband project is anticipated to be buried approximately 1 metre underground and underneath waterbodies, only temporary and minimal changes in groundwater are expected during construction, which does not overlap temporally with the Community Access Road.

10.3.2.3 Fragmentation and Edge Effects

The Community Access Road, Northern Road Link, Anaconda and Painter Lake Forestry Access Road upgrades, and Rapid Lynx Broadband project will create new

linear corridor for at least some portion of their alignments, introducing new fragmentation and edge effects on the landscape primarily in the northern and southern portions of the effects assessment Regional Study Area; therefore, resulting in additional vegetation loss.

The projects will introduce an additional 2,555.9 hectares of fragmentation and edge effects layered on the existing disturbance within the effects assessment Regional Study Area and the Community Access Road effects assessment Construction Disturbance Area footprint.

Climate change may have additional negative effects on the availability, distribution, composition, and function of vegetation valued components, although these effects are expected to occur even in the absence of further fragmentation and edge effects.

10.3.2.4 Fugitive Dust Emissions

Dust accumulation may locally and directly impact vegetation by smothering plant tissues, hindering gas exchange, and reducing photosynthesis by blocking sunlight (Hirano et al., 1995; Prajapati, 2012). Dust often contains metals or pollutants, which can leach into the soil, causing toxicity or nutrient imbalances in plants. This can also degrade plant health and alter plant species composition, structure, and biomass in affected areas.

Fugitive dust emissions are anticipated from construction activities from the Community Access Road, Northern Road Link, and Anaconda and Painter Lake Forestry Access Road upgrades, such as land clearing, blasting, and infrastructure implementation, and traffic on the all-season and access roads. Effects from fugitive dust emissions will begin during construction of the Community Access Road and continue through operations.

It is assumed that the construction and operations of the Northern Road Link and Anaconda and Painter Lake Forestry Access Road upgrades will produce similar levels of dust and metal deposition as estimated for the Community Access Road, meaning that the projects are expected to result in an increased residual effect from fugitive dust emissions on vegetation valued components.

The effects related to climate change are uncertain, but probable to occur and may alter the processes that influence the availability and distribution of vegetation valued components.

10.3.2.5 Mitigation Measures

It is anticipated that the mitigation measures that will be implemented to minimize the effects from direct vegetation loss, changes to groundwater, fragmentation of edge

effects, and fugitive dust emissions during the construction and operation of the Northern Road Link, Anaconda and Painter Lake Forestry Access Road upgrades, and Rapid Lynx Broadband project will be similar to those implemented for the Community Access Road. Refer to **Section 9.4.2** for a complete description of the proposed mitigation measures for vegetation.

It is expected that the effectiveness of mitigation measures for these activities will be evaluated throughout construction and operations, and will be modified or enhanced as necessary through adaptive management.

As a best practice, it is suggested that the monitoring programs of the Community Access Road and any reasonably foreseeable developments share relevant monitoring data for areas where predicted effects may overlap.

10.3.2.6 Determination of Significance

Relative to existing conditions, vegetation valued components are expected to remain abundant, intact, and well distributed across the effects assessment Regional Study Area. The contribution of the Community Access Road and other reasonably foreseeable developments to cumulative residual effects on vegetation valued components in the Cumulative Effects Assessment is not expected to change the self-sustaining and ecologically effective status of vegetation valued components.

Residual cumulative effects on vegetation valued components were considered **not significant** as the residual effects were assessed to be negligible, low, or medium in magnitude and within the resilience limits and adaptive capacity of the existing vegetation valued components.

The exception to this result is for Wetland Ecosystems, and specifically peatland ecosystems that comprise a large component of Wetland Ecosystems. The cumulative residual effects to Wetland Ecosystems resulting from changes to groundwater are dependant on the success of the proposed mitigations, including the implementation of the “floating road” construction technique for crossing peatland ecosystems. While it is predicted that the contribution of the Community Access Road and other reasonably foreseeable developments to cumulative residual effects on Wetland Ecosystems in the effects assessment Regional Study Area are not expected to change the self-sustaining and ecologically effective status of Wetland Ecosystems, there is still a high level of uncertainty surrounding the Community Access Road’s cumulative residual effect on Wetland Ecosystems. As a result, a precautionary approach has been applied and cumulative residual effects on Wetland Ecosystems are predicted to be **significant**.

10.3.3 Wildlife

Six valued components with residual effects were carried forward to the wildlife valued component Cumulative Effects Assessment:

- Bats (little brown myotis and northern myotis);
- Furbearers (wolverine);
- Furbearers (American marten);
- Furbearers (beaver);
- Reptiles and amphibians; and
- Pollinating insects.

Changes from the Community Access Road and the other reasonably foreseeable developments will be mostly permanent; some temporary work areas may be reclaimed but most of the project footprints will remain disturbed. Effects from past, present, and reasonably foreseeable activities will begin during construction of the Community Access Road and continue through operations.

10.3.3.1 Bats (Little Brown Myotis and Northern Myotis)

The addition of the Community Access Road, Northern Road Link, Anaconda and Painter Lake Forestry Access Road upgrades, and Rapid Lynx Broadband project are expected to result in effects on little brown myotis and northern myotis from habitat loss and alteration, sensory disturbance, incidental take, fugitive dust emissions, changes to groundwater, and collisions with vehicles relative to existing conditions.

The Community Access Road and other reasonably foreseeable developments will result in the removal of 912 hectares of little brown myotis and northern myotis maternity roost habitat, representing 3.4 percent of the suitable maternity roost habitat in the cumulative effects Regional Study Area Although forest harvest is considered a temporary habitat loss, it is expected that continued forest harvest would reduce suitable mature forest and continue to add to the cumulative disturbance of bat roosting habitat.

Sensory disturbance (loud noises, lights, smells, dust, and human activity) associated with the construction and / or operations of the Community Access Road and other reasonably foreseeable developments could lead to reduced survivorship and / or reproductive success for little brown myotis and northern myotis occupying habitats near the project footprints, as bats may avoid the Community Access Road area and the areas within 100 metres of the footprints.

In addition, the effects related to climate change are uncertain but are mostly assumed to have an adverse influence on bat habitat.

However, it is predicted that the changes to little brown myotis and northern myotis habitat availability, distribution, and population survival and reproduction are expected to remain within the resilience and adaptability limits of the regional populations in the wildlife effects assessment Regional Study Area.

10.3.3.2 Furbearers (Wolverine)

The addition of the Community Access Road, Northern Road Link, Anaconda and Painter Lake Forestry Access Road upgrades, and Rapid Lynx Broadband project are expected to result in effects on wolverine from habitat loss and alteration, sensory disturbance, an increase in predator access, incidental take, collisions with vehicles and equipment, fugitive dust emissions, changes to groundwater, and an increase in public access relative to existing conditions.

Areas where wolverine denning habitat may be affected by road effects in the Cumulative Effects Assessment are shown on **Figure 10.3-4**.

The Community Access Road and the other reasonably foreseeable developments are predicted to remove 75,109 hectares of previously undisturbed habitat for wolverine. This represents a change of 0.47 percent of suitable habitat within the wolverine effects assessment Regional Study Area relative to existing conditions. Additionally, potential denning habitat within 4 kilometres of the road project are predicted to be indirectly affected by road effects.

Sensory disturbance (loud noises, lights, smells, dust, and human activity) associated with the construction or operations of the Community Access Road and other reasonably foreseeable developments are expected to affect wolverine habitat availability, distribution, and survival and reproduction through loss of quality denning habitat, general avoidance behaviour, changes to the quality and quantity of food resources as well as potential juvenile mortality, in areas within several kilometres of construction areas.

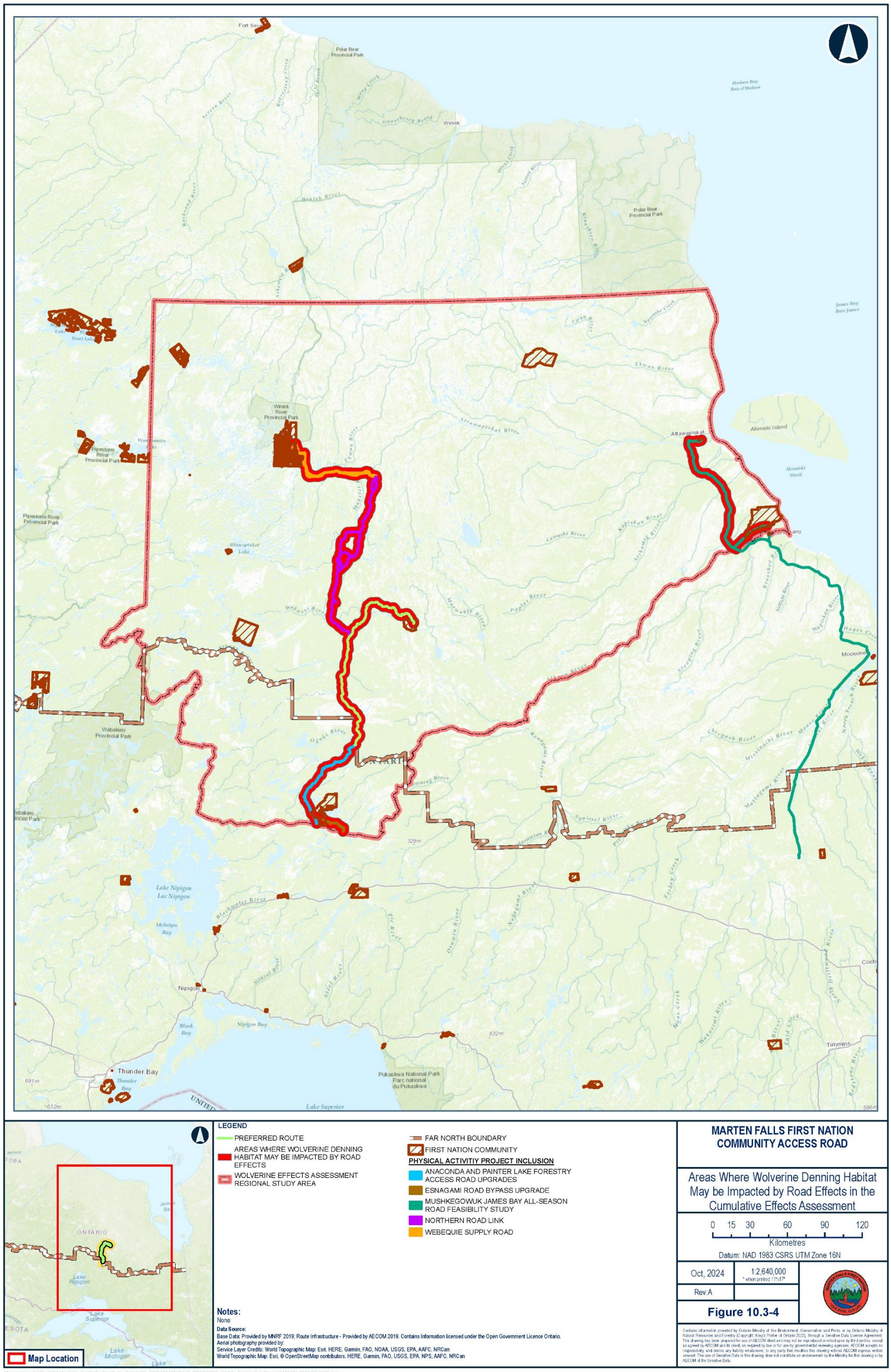
Incidental take of wolverines may occur as a result of either the destruction of dens or from collisions with vehicles, equipment, or public vehicles using the Community Access Road and other reasonably foreseeable developments or associated infrastructure.

In addition, the effects related to climate change are uncertain but are mostly assumed to have an adverse influence on wolverines.

Changes from the Community Access Road and the other reasonably foreseeable developments will be mostly permanent; some temporary work areas may be reclaimed but most of the project footprints will remain disturbed.

However, the wolverine population is expected to remain self-sustaining and ecologically effective in the wolverine effects assessment Regional Study Area after implementation of the Community Access Road and the other reasonably foreseeable developments.

Figure 10.3-4: Areas Where Wolverine Denning Habitat May be Impacted by Road Effects in the Cumulative Effects Assessment



10.3.3.3 Furbearers (American Marten)

The addition of the Community Access Road, Northern Road Link, Anaconda and Painter Lake Forestry Access Road upgrades, and Rapid Lynx Broadband project are expected to result in effects on American marten from habitat loss and alteration, sensory disturbance, an increase in predator access, incidental take, collisions with vehicles and equipment, fugitive dust emissions, changes to groundwater, and an increase in public access relative to existing conditions.

The Community Access Road, Northern Road Link, Anaconda and Painter Lake Forestry Access Road upgrades, and Rapid Lynx Broadband project are predicted to remove 4,870 hectares of moderate to high suitability habitat for American marten. This represents a change of 2.05 percent of suitable habitat.

Sensory disturbance (loud noises, lights, smells, dust, and human activity) associated with the construction or operations of the Community Access Road and the other reasonably foreseeable developments may affect American marten survival and reproduction through loss of quality denning habitat.

Incidental take of martens may occur as a result of the destruction of dens if work is conducted within the denning window (May to July). The cumulative effect of incidental take of American marten is possible if dens are removed or disturbed during denning season for the construction of the Community Access Road, Northern Road Link, Anaconda and Painter Lake Forestry Access Road upgrades, and Rapid Lynx Broadband project.

The construction of the Community Access Road and the other reasonably foreseeable developments is anticipated to result in an increase in public access and may result in a subsequent increase in trapping effort and an increase in marten mortality in the areas surrounding the Community Access Road corridor and the Northern Road Link.

In addition to human activities, climate change may contribute cumulatively to changes in the quality, quantity, and distribution of American marten habitat, and marten survival and reproduction; however, the magnitude is uncertain.

Overall, the American marten population is expected to remain self-sustaining and ecologically effective in the wildlife effects assessment Regional Study Area after implementation of the Community Access Road and the other reasonably foreseeable developments.

10.3.3.4 Furbearers (Beaver)

The addition of the Community Access Road, Northern Road Link, Anaconda and Painter Lake Forestry Access Road upgrades, and Rapid Lynx Broadband project are

expected to result in effects on beaver from habitat loss and alteration, sensory disturbance, an increase in predator access, incidental take, collisions with vehicles and equipment, fugitive dust emissions, changes to groundwater, and an increase in public access relative to existing conditions.

The Community Access Road and the other reasonably foreseeable developments will result in the removal of 1,622 hectares of moderate to high suitability habitat for beaver, representing 1.22 percent of the suitable wetland beaver habitat in the wildlife effects assessment Regional Study Area available at existing conditions.

The construction of the Community Access Road and the other reasonably foreseeable developments is anticipated to result in an increase in public access that were not previously accessible by vehicle in existing conditions, resulting in a subsequent increase in trapping effort and an increase in beaver mortality in the areas surrounding the Community Access Road corridor and the Northern Road Link.

Additionally, climate change and related effects (including decreased wetland availability) may have continuous, permanent effects on beaver habitat availability that occur beyond the regional scale; however, the magnitude of changes due to climate change are uncertain.

Overall, the beaver population is expected to remain self-sustaining and ecologically effective in the wildlife effects assessment Regional Study Area after implementation of the Community Access Road and the other reasonably foreseeable developments.

10.3.3.5 Reptiles and Amphibians

The addition of the Community Access Road, Northern Road Link, Anaconda and Painter Lake Forestry Access Road upgrades, and Rapid Lynx Broadband project are expected to result in effects on reptiles and amphibians from habitat loss and alteration, sensory disturbance, incidental take, fugitive dust emissions, changes to groundwater, and collisions with vehicles and equipment relative to existing conditions.

The Community Access Road and other reasonably foreseeable developments will result in the removal of 3,806 hectares of wetland, representing 1.1 percent of the suitable wetland amphibian breeding habitat in the wildlife effects assessment Regional Study Area that are available at existing conditions.

Sensory disturbance (loud noises, lights, smells, dust, and human activity) associated with the construction and / or operations of the Community Access Road and other reasonably foreseeable developments are predicted to affect reptile and amphibian survival and reproduction through decreased reproductive success.

Incidental take may occur as a result of either the destruction of individuals through clearing and grubbing or from collisions with Project vehicles, equipment, or public vehicles using the Community Access Road, Northern Road Link, and upgraded Anaconda and Painter Lake Forestry Access Roads.

In addition, the effects related to climate change are uncertain but are mostly assumed to have continuous, permanent effects on reptile and amphibian habitat availability, survival and reproduction; however, magnitude is difficult to predict.

Overall, the reptile and amphibian populations are expected to remain self-sustaining and ecologically effective in the wildlife effects assessment Regional Study Area after implementation of the Community Access Road and the other reasonably foreseeable developments.

10.3.3.6 Pollinating Insects

The addition of the Community Access Road, Northern Road Link, Anaconda and Painter Lake Forestry Access Road upgrades, and Rapid Lynx Broadband project are expected to result in effects on pollinating insects from habitat loss and alteration, incidental take, fugitive dust emissions, changes to groundwater, and collisions with vehicles and equipment relative to existing conditions.

The Community Access Road and other reasonably foreseeable developments will result in the removal of 4,700 hectares of mostly undisturbed natural habitat, the majority of which is vegetated and provides foraging resources for pollinating insects.

Incidental take of pollinating insects may occur during the construction and operation as a result of either the destruction of individuals or bumblebee nest or bumblebee / beetle overwintering habitats through clearing and grubbing or from collisions with Project vehicles, equipment, or public vehicles using the Community Access Road, Northern Road Link, and upgraded Anaconda and Painter Lake Forestry Access Roads.

Additionally, climate change may have negative or positive effects on flowering plants and pollinators (elevated carbon dioxide, altered precipitation patterns, and warming temperatures); however, the magnitude is unknown.

Overall, the pollinating insect populations are expected to remain self-sustaining and ecologically effective in the wildlife effects assessment Regional Study Area after implementation of the Community Access Road and the other reasonably foreseeable developments.

10.3.3.7 Mitigation Measures

It is anticipated that avoidance and mitigation measures will be implemented to limit impacts to wildlife during the construction and operations of the Northern Road Link,

Anaconda and Painter Lake Forestry Access Road upgrades, and Rapid Lynx Broadband project and they will be similar to those implemented for the Community Access Road. Refer to **Section 9.4.3** for a complete description of the proposed mitigation measures for wildlife.

10.3.3.8 Determination of Significance

As mandated by the Impact Assessment Agency of Canada, determination of significance was predicted for cumulative effects on valued components that are species designated as threatened or endangered under Ontario's *Endangered Species Act* (Government of Ontario, 2007) or the federal *Species at Risk Act* (Government of Canada, 2002), and species of traditional / cultural importance to First Nations and as such are considered a part of Aboriginal Treaty Rights and Interests.

Significance was determined only for disciplines where it was required to meet federal or provincial requirements. For the purposes of this Cumulative Effects Assessment, significance of the effects for reptiles and amphibians and pollinating insects were not determined.

10.3.3.8.1 Bats

The regional little brown myotis and northern myotis populations are expected to remain self-sustaining and ecologically effective in the Cumulative Effects Assessment (in other words, there is no predicted change in the assessment endpoints). The anticipated changes to little brown myotis and northern myotis habitat availability, distribution, and survival and reproduction from the Community Access Road, other reasonably foreseeable developments, and climate change are expected to remain within the resilience and adaptability limits of the regional populations. The cumulative residual effects from the previous, existing, and reasonably foreseeable developments (including the Community Access Road) and climate change on little brown myotis and northern myotis are therefore considered **not significant** assuming the mitigation measures are implemented.

10.3.3.8.2 Wolverine

Regional wolverine populations may not remain self-sustaining and ecologically effective in the Cumulative Effects Assessment (in other words, there is a predicted change in the assessment endpoints). The anticipated changes to wolverine habitat availability, distribution, and survival and reproduction from the Project, other reasonably foreseeable developments, and climate change may not remain within the resilience and adaptability limits of the regional populations. Due to the high level of uncertainty (in other words, low prediction confidence), a precautionary approach was

applied, and the cumulative residual effects from the previous, existing, and reasonably foreseeable developments (including the Project) and climate change on wolverines are therefore considered **significant**.

10.3.3.8.3 American Marten

Regional American marten populations are expected to remain to be self-sustaining and ecologically effective in the Cumulative Effects Assessment (in other words, there is no predicted change in the assessment endpoints). The anticipated changes to marten habitat availability, distribution, and survival and reproduction from the Project, other reasonably foreseeable developments, and climate change are expected to remain within the resilience and adaptability limits of the regional populations. The cumulative residual effects from the previous, existing, and reasonably foreseeable developments (including the Project) and climate change on American martens are therefore considered **not significant** assuming the mitigation measures are implemented.

10.3.3.8.4 Beaver

Regional beaver populations are expected to remain to be self-sustaining and ecologically effective in the Cumulative Effects Assessment (in other words, there is no predicted change in the assessment endpoints). The anticipated changes to beaver habitat availability, distribution, and survival and reproduction from the Project, other reasonably foreseeable developments, and climate change are expected to remain within the resilience and adaptability limits of the regional populations. The cumulative residual effects from the previous, existing, and reasonably foreseeable developments (including the Project) and climate change on beavers are therefore considered **not significant** assuming the mitigation measures are implemented.

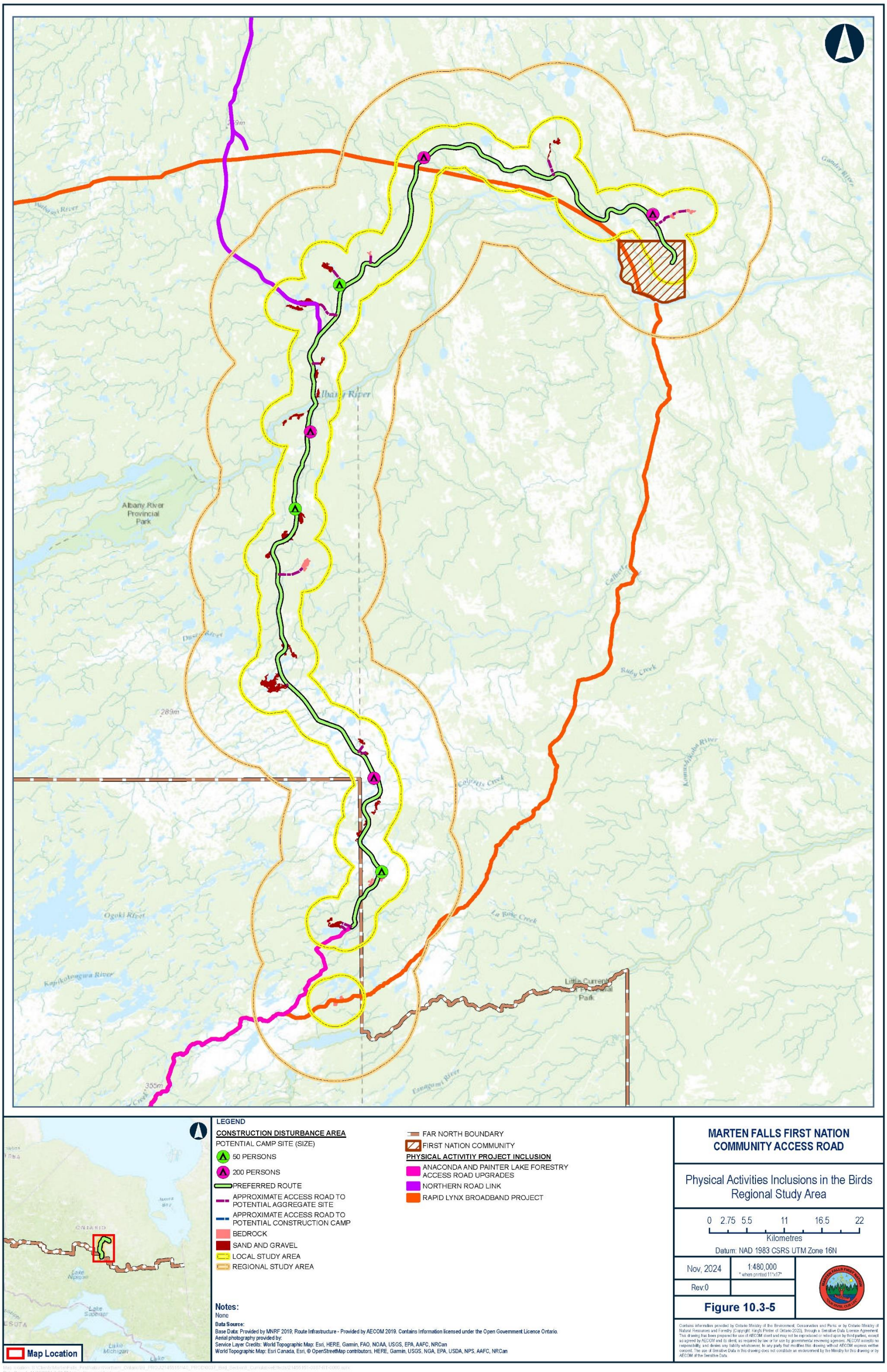
10.3.4 Birds

Five valued components with residual effects were carried forward to the birds valued components Cumulative Effects Assessment:

- Changes to groundwater;
- Dust deposition;
- Habitat loss and alteration;
- Sensory disturbance; and
- Increase in edge habitat.

The locations of the projects considered for the Cumulative Effects Assessment in relation to the birds Regional Study Area are shown on **Figure 10.3-5**.

Figure 10.3-5: Physical Activities Inclusions in the Birds Regional Study Area



10.3.4.1 Changes to Groundwater

The Community Access Road, Northern Road Link, and Anaconda and Painter Lake Forestry Access Road upgrades may cause alterations to drainage patterns, recharge rates and increased or decreased groundwater levels due to activities such as road construction through wetlands, changes to topography, short-term water-taking, pit / quarry dewatering and discharge of water, thereby affecting bird habitat availability and distribution.

Due to the predicted similar aggregate requirements and residual effects of the Community Access Road, Northern Road Link, and Anaconda and Painter Lake Forestry Access Road upgrades, it is not expected that there would be any additional pit or quarry development and dewatering in the areas where the projects overlap.

Due to the limited spatial and temporal overlaps of the Community Access Road and reasonably foreseeable developments, it is not expected that there would be any additional cumulative effects due to road construction in peatland areas. There may be potential for additional cumulative effects beyond the predicted residual effects levels in the area where the Community Access Road and the Northern Road Link would meet if they both cross the same peatland area.

Overall, the anticipated changes to bird valued component habitat availability and distribution from changes to groundwater quantity are expected to remain within the resilience and adaptability limits of the regional populations, bird valued component are predicted to remain self-sustaining and ecologically effective.

10.3.4.2 Dust Deposition

Accumulation of airborne dust produced from the Community Access Road and other reasonably foreseeable developments may result in direct, localized changes to vegetation, possibly altering plant species composition, structure, and biomass. As a result, dust generated by construction activities could adversely affect birds by degrading habitat quality and forage availability and distribution.

Dust accumulation is expected to occur during construction and operations of the Community Access Road, Anaconda and Painter Lake Forestry Access Road upgrades, and Rapid Lynx Broadband project, and may result in direct, localized changes to vegetation.

However, the anticipated changes to bird valued component habitat availability and distribution from dust deposition from reasonably foreseeable developments are

expected to remain within the resilience and adaptability limits of the regional populations. Bird valued components are predicted to remain self-sustaining and ecologically effective after cumulative effects dust deposition on habitat from reasonably foreseeable developments.

10.3.4.3 Habitat Loss and Alteration

The Community Access Road, Northern Road Link, Anaconda and Painter Lake Forestry Access Road upgrades, and Rapid Lynx Broadband project are predicted to remove high suitability and moderate suitability breeding habitat for a number of bird species.

Effects from habitat loss from the Anaconda and Painter Lake Forestry Access Road upgrades and Rapid Lynx Broadband project are assumed to begin prior to construction of the Community Access Road and continue through operations of the Community Access Road. Effects from habitat loss from the Northern Road Link are assumed to begin and continue through operations of the Community Access Road.

Additionally, climate change may increase temperatures, the frequency and severity of wildfires, and insect outbreaks, all of which may affect the condition of boreal forest ecosystems; however, the magnitude of impacts from climate change are unknown.

The bird species included as part of this Cumulative Effects Assessment are predicted to remain self-sustaining and ecologically effective with the implementation of the Community Access Road and other reasonably foreseeable developments.

Overall, the anticipated changes to bird habitat availability, distribution, and survival and reproduction due to habitat loss and alteration from the Community Access Road and other reasonably foreseeable developments are expected to remain within the resilience and adaptability limits of the regional population.

10.3.4.4 Sensory Disturbance

Sensory disturbance during construction and operations of the reasonably foreseeable developments could result in the indirect loss or degradation of suitable habitat if individuals avoid areas with sensory disturbance.

Sensory disturbance effects from all reasonably foreseeable developments may overlap construction of the Community Access Road. Sensory disturbance will only occur during construction of the Rapid Lynx Broadband project, unless maintenance of the broadband cable is required during operations.

Bird valued components are predicted to remain self-sustaining and ecologically effective with the implementation of the Community Access Road and other reasonably foreseeable developments. Overall, the anticipated changes to bird habitat availability, distribution, and survival and reproduction due to sensory disturbance from the Community Access Road and other reasonably foreseeable developments are expected to remain within the resilience and adaptability limits of the regional population.

10.3.4.5 Increase in Edge Habitat

The creation of forest edge due to the construction of the Community Access Road, Northern Road Link, and Rapid Lynx Broadband project may facilitate predator movement and access to nests in adjacent forest habitats. However, anticipated increases in predation risk due to increased edge habitat are expected to be relatively small.

Changes to predation risk due to increased edge habitat from construction of reasonably foreseeable developments are not expected to have a measurable effect on bird survival and reproduction for the populations in the in the Cumulative Effects Assessment Regional Study Area.

10.3.4.6 Mitigation Measures

It is anticipated that the mitigation measures that will be implemented to limit changes to groundwater quality, habitat loss, sensory disturbance and increase in edge habitat during the construction and operation of the Northern Road Link and Anaconda and Painter Lake Forestry Access Road upgrades will be similar to those implemented for the Community Access Road. Refer to **Section 9.4.4** for a complete description of the proposed mitigation measures for birds.

As a best practice, it is suggested that the monitoring programs of the Community Access Road and any reasonably foreseeable developments share relevant monitoring data for areas where predicted effects may overlap.

10.3.4.7 Determination of Significance

As mandated by the Impact Assessment Agency of Canada, determination of significance was predicted for cumulative effects on valued components that are species designated as threatened or endangered under federal *Species at Risk Act* (Government of Canada, 2002),and species of traditional / cultural importance to First Nations and as such are considered a part of Aboriginal Treaty Rights and Interests.

The bird species included as part of this Cumulative Effects Assessment are predicted to remain self-sustaining and ecologically effective with the implementation of the

Community Access Road and other reasonably foreseeable developments. Overall, the anticipated changes to bird habitat availability, distribution, and survival and reproduction due to habitat loss and alteration from the Community Access Road and other reasonably foreseeable developments are expected to remain within the resilience and adaptability limits of the regional population. The cumulative residual effects from previous, existing, and reasonably foreseeable developments (including the Community Access Road) are therefore considered **not significant**.

However, climate change may have significant effects on the bird populations beyond the Cumulative Effects Assessment Regional Study Area if temperatures increase by 1.5 degrees Celsius to 3.0 degrees Celsius relative to current conditions.

10.3.5 Ungulates

Two valued components with residual effects were carried forward to the ungulates Cumulative Effects Assessment:

- Boreal caribou; and
- Moose

10.3.5.1 Boreal Caribou

The Community Access Road, past, present, and reasonably foreseeable developments are predicted to have the following cumulative effects on boreal caribou:

- Additional 290,662 hectares of new disturbance in the boreal caribou effects assessment Regional Study Area. This is expected to increase the proportion of total disturbance (anthropogenic and natural combined) in the caribou effects assessment Regional Study Area from 24.3 percent to 25.7 percent.
- Additional 116,729 hectares of anthropogenic disturbance in the Missisa range. This is expected to increase the proportion of total disturbance (anthropogenic and natural combined) in the Missisa range from 6.2 percent to 7.7 percent.
- Additional 5,654 hectares of permanent disturbance in the Nipigon range. This is expected to increase the proportion of total disturbance in the Nipigon range from 45.8 percent to 45.9 percent.
- Additional 169,601 hectares of new anthropogenic disturbance in the Ozhiski range. This is expected to increase the proportion of total disturbance (anthropogenic and natural combined) in the Ozhiski range from 24.5 percent to 28.6 percent.

- Additional 154 hectares of permanent disturbance in the Pagwachuan range. This is expected to increase the proportion of total disturbance (anthropogenic and natural combined) in the Pagwachuan range by less than 0.01 percent.
- Sensory disturbance (noise, smells, light spill, human presence) are expected to reduce habitat quality and elicit avoidance by boreal caribou in proximity of the Construction Disturbance Area of each respective project.
- Linear disturbances may result in physical and perceived barriers to movement for boreal caribou, particularly in the Missisa and Ozhiski ranges, where boreal caribou are naïve to permanent road disturbances and may demonstrate strong avoidance behaviours.
- Introduction of linear corridors expected to be used by predators and the public to facilitate access to areas that are less accessible in the existing environment.
- Introduction of roads (all-season roads, temporary and permanent access roads), are expected to increase the risk of boreal caribou collisions with vehicles and equipment.
- Dust deposition is predicted to degrade vegetation in areas immediately adjacent to the Community Access Road and past, present, and reasonably foreseeable developments.
- Potential for alterations to drainage patterns, and increase or decrease of groundwater levels, thereby affecting boreal caribou habitat availability and distribution.

Cumulative effects on habitat for boreal caribou are shown on **Figure 10.3-6**. Predicted habitat quality in the boreal caribou Regional Study Area during the Cumulative Effects Assessment are show on **Figure 10.3-7** to **Figure 10.3-11**.

Cumulative effects to boreal caribou will begin during construction of the Community Access Road and continue through operations. Some changes that occur in the arrangement and connectivity of habitat will be permanent for all-season road projects where operations are indefinite, while other projects have temporary operations and are expected to be restored.

In addition, the effects related to climate change are uncertain but are mostly assumed to have an adverse influence on boreal caribou.

Figure 10.3-6: Anthropogenic Disturbance in the Boreal Caribou Regional Study Area during the Cumulative Effects Assessment

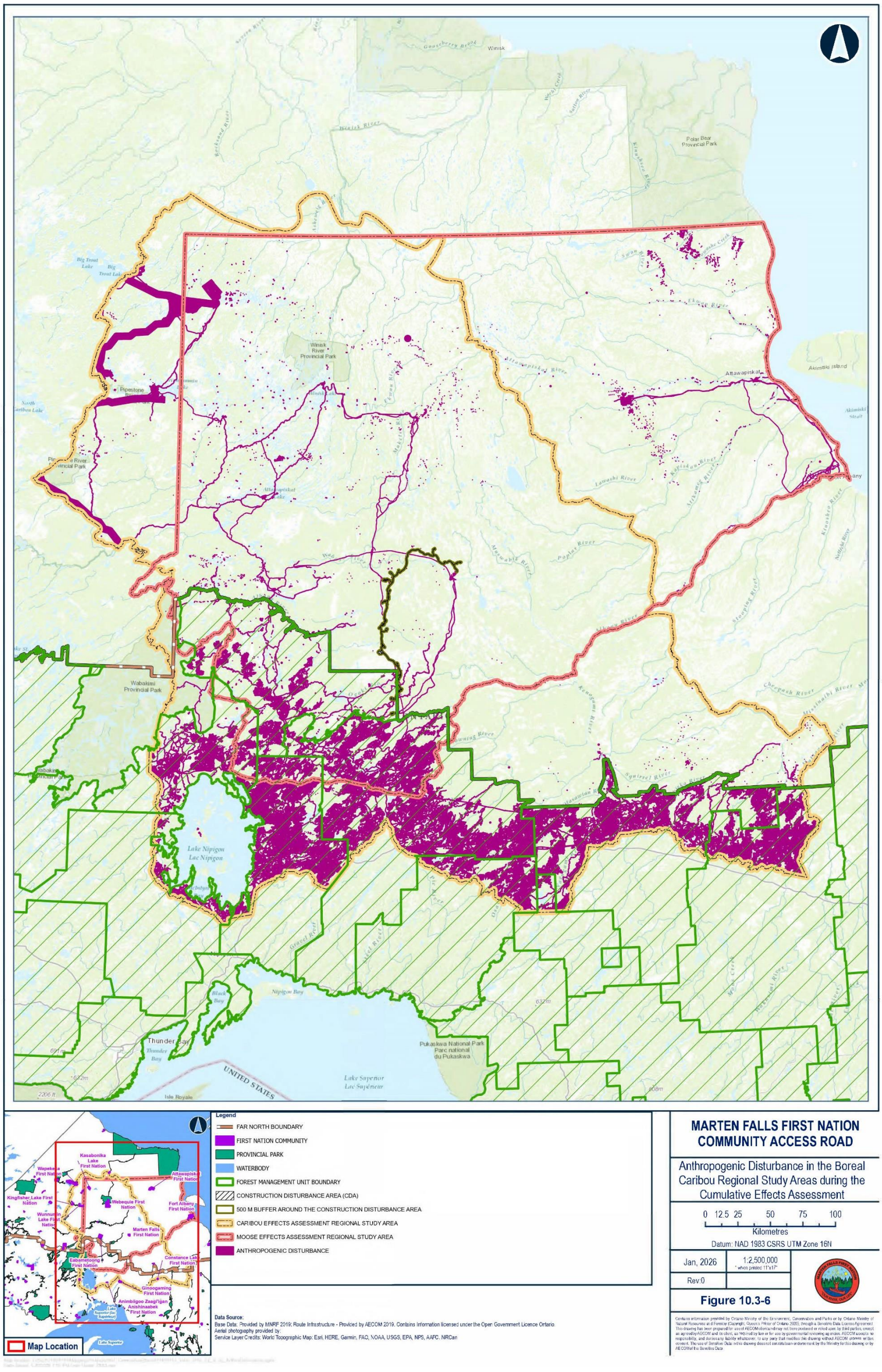


Figure 10.3-7: Predicted Habitat Quality during Calving Season in the Boreal Caribou Regional Study Area During the Cumulative Effects Assessment

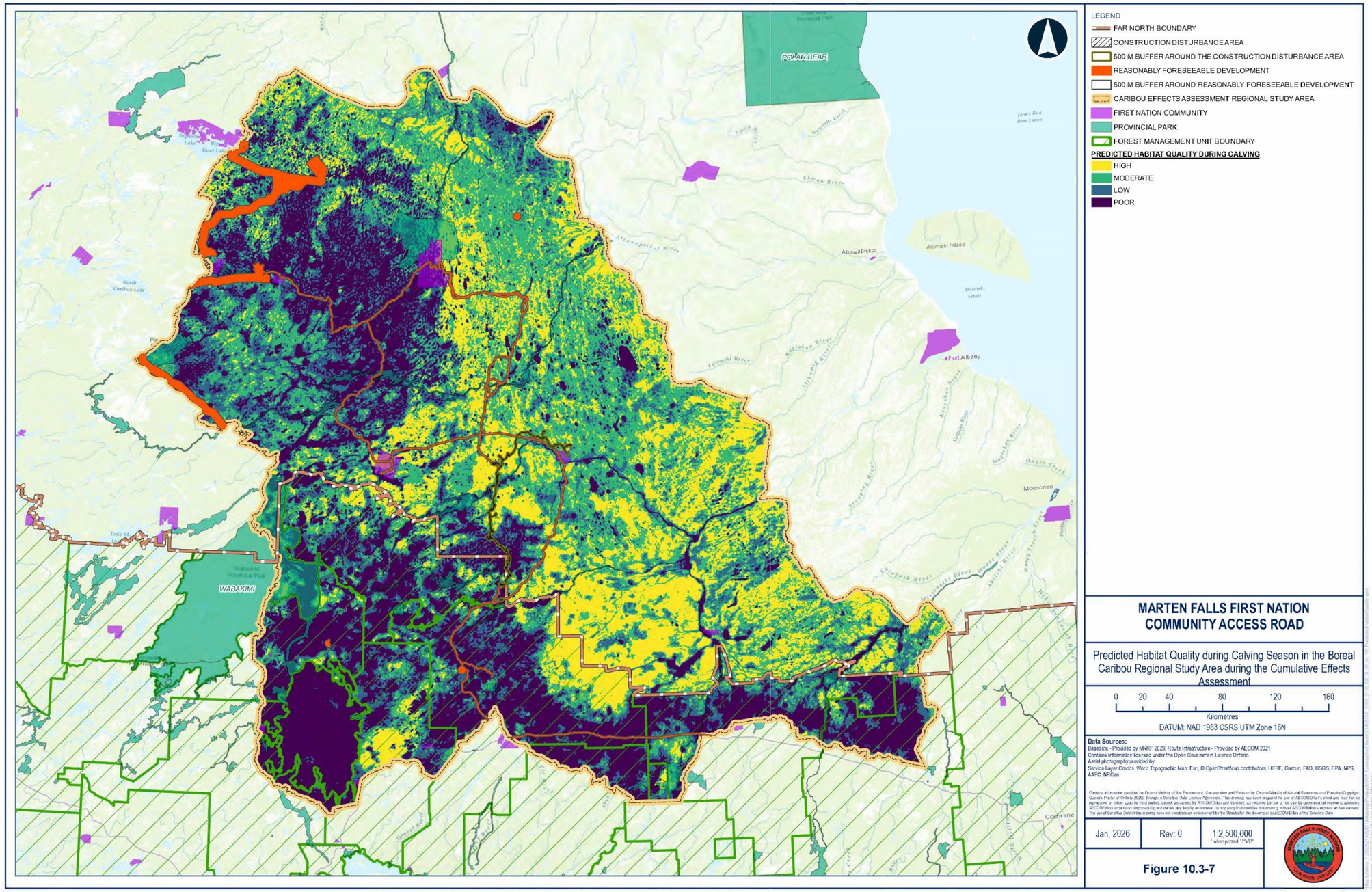


Figure 10.3-8: Predicted Habitat Quality during Summer Season in the Boreal Caribou Regional Study Area During the Cumulative Effects Assessment

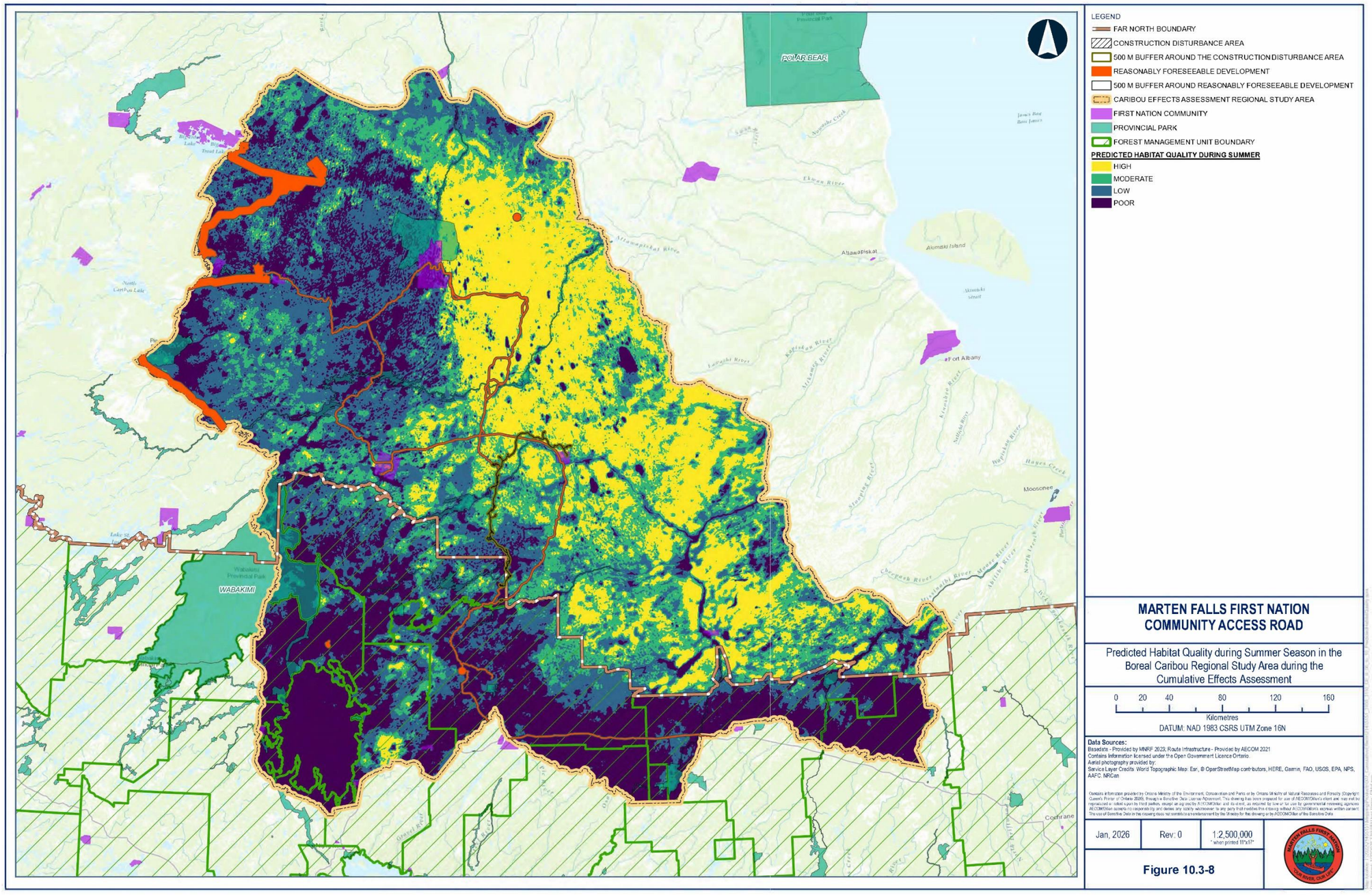


Figure 10.3-9: Predicted Habitat Quality during Fall Season in the Boreal Caribou Regional Study Area During the Cumulative Effects Assessment

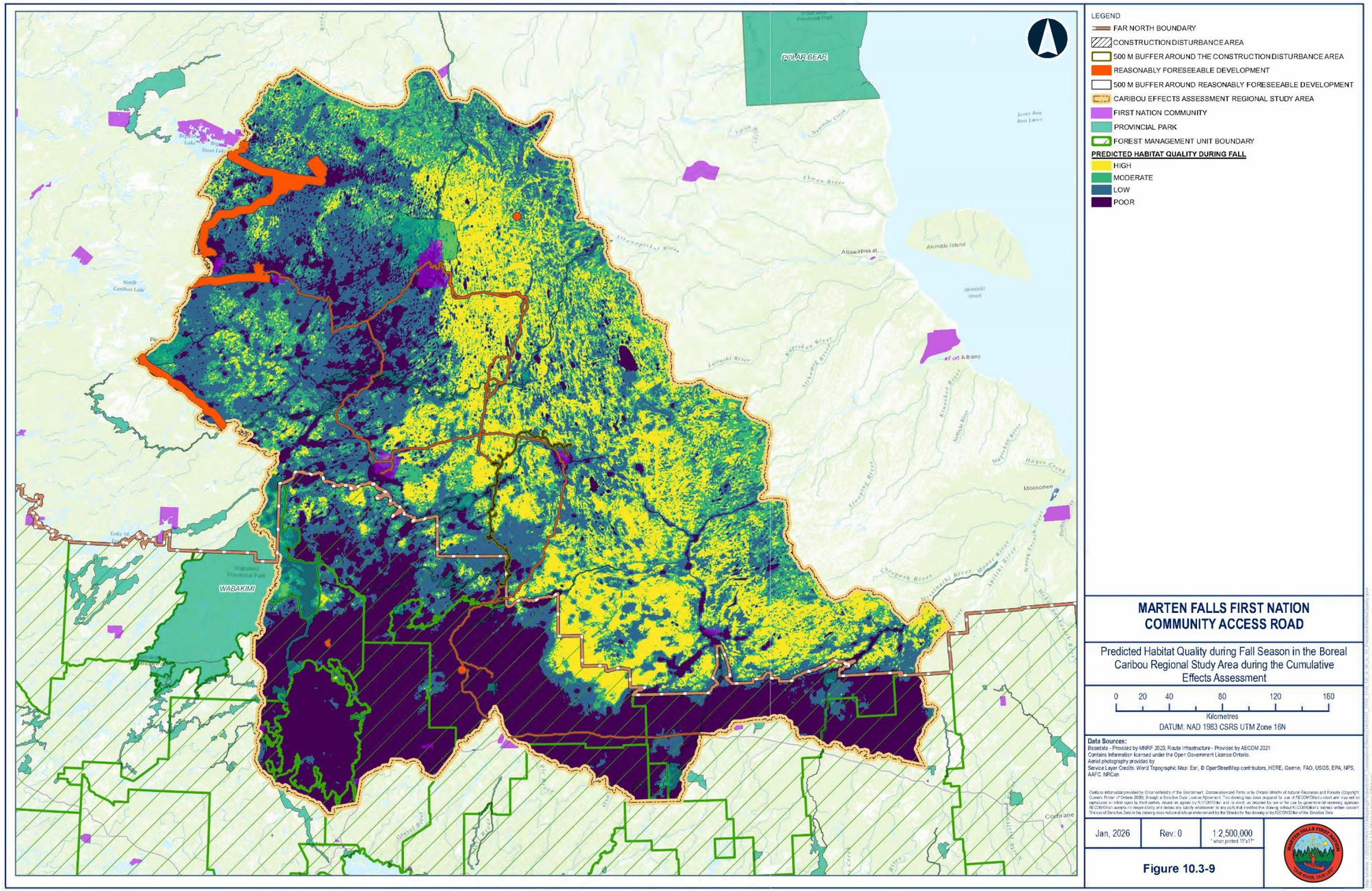


Figure 10.3-10: Predicted Habitat Quality during Winter Season in the Boreal Caribou Regional Study Area During the Cumulative Effects Assessment

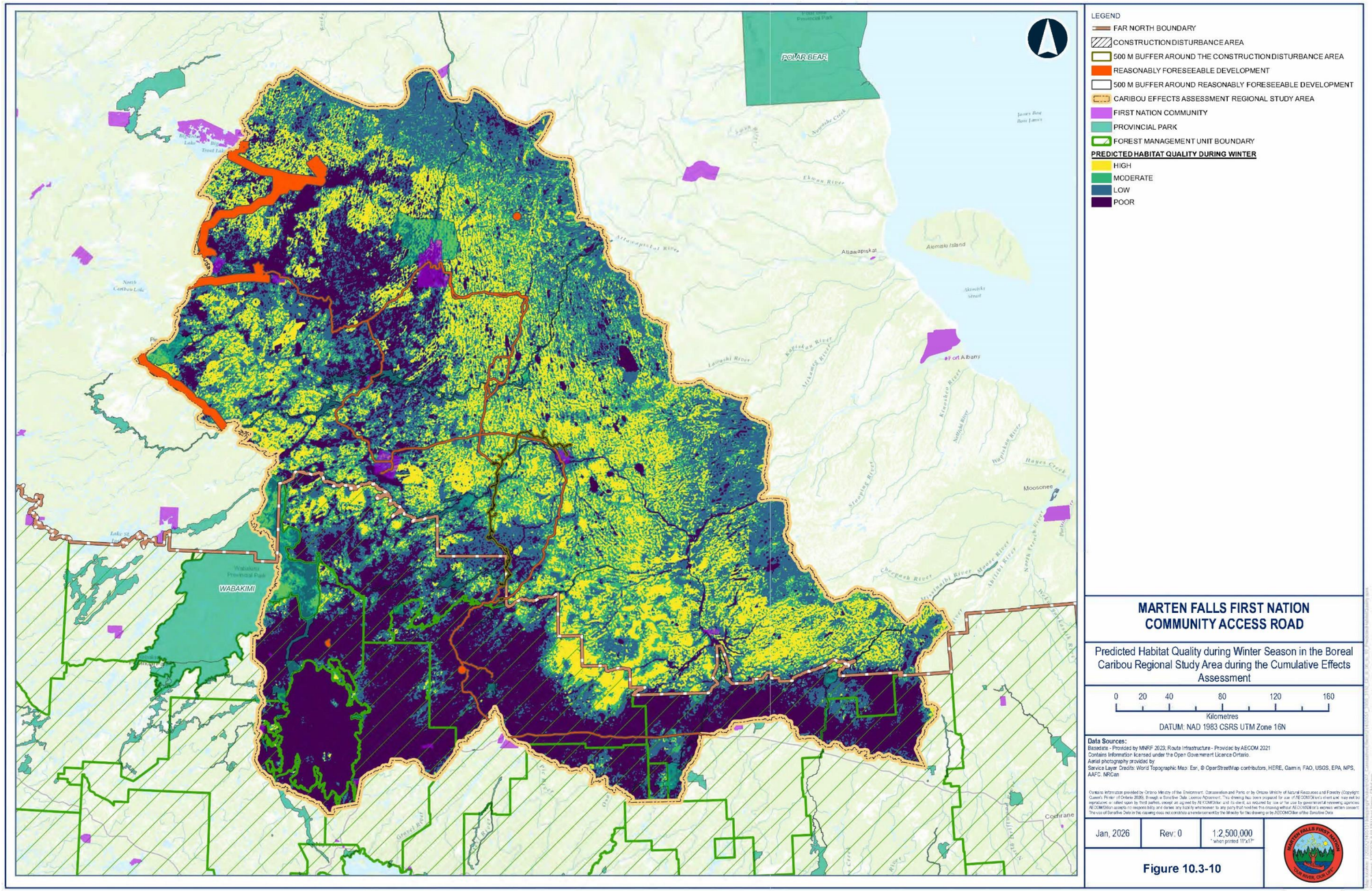
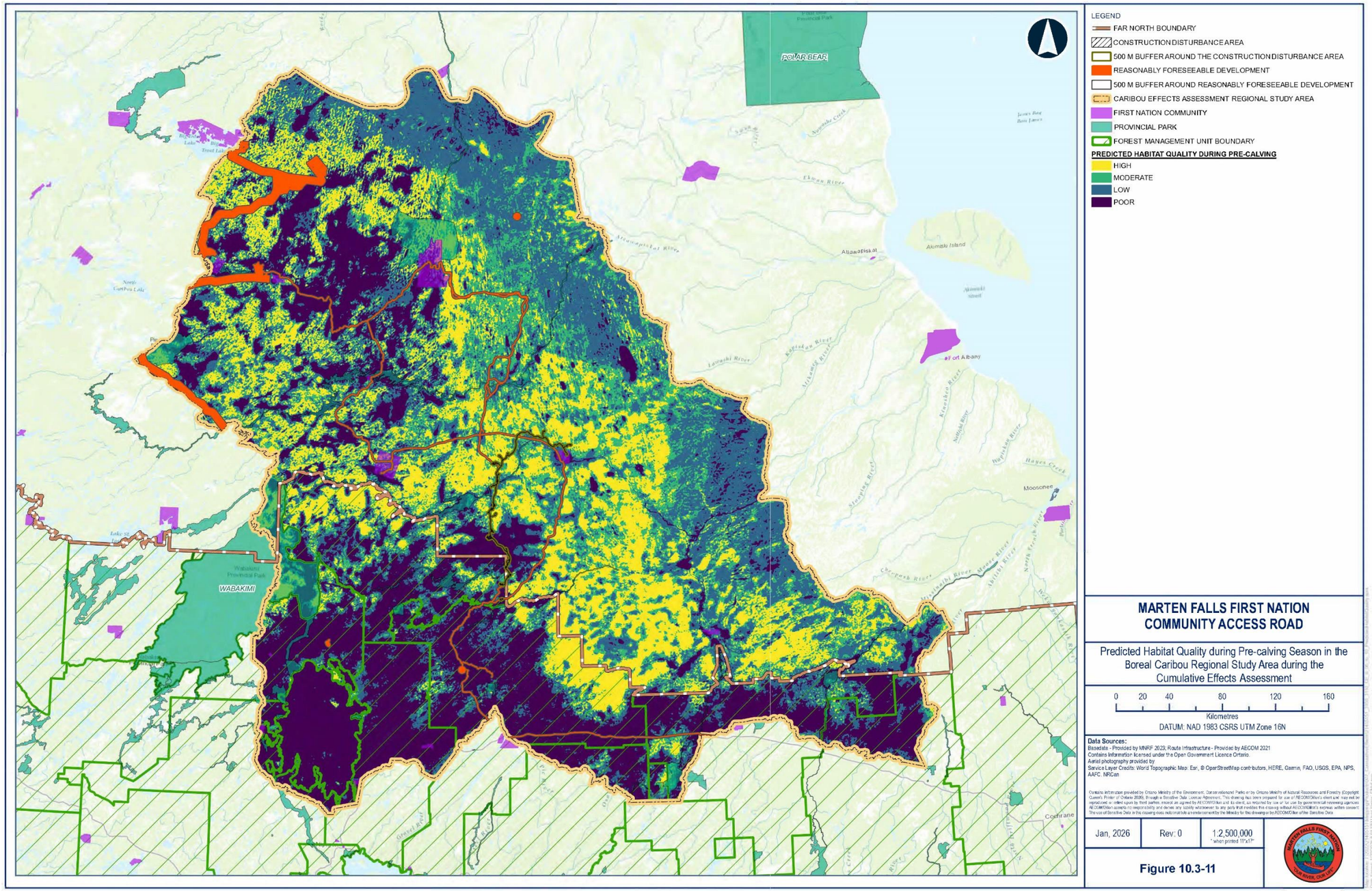


Figure 10.3-11: Predicted Habitat Quality during Pre-calving Season in the Boreal Caribou Regional Study Area During the Cumulative Effects Assessment



Effects from habitat loss and alteration on the ability of the boreal caribou populations in the boreal caribou effects assessment Regional Study Area to remain self-sustaining and ecologically functional are anticipated to be negative and of low magnitude for the Missisa, Ozhiski and Pagwachuan ranges. The Nipigon range was assessed as not self-sustaining under existing conditions, and thus any additional habitat loss is considered to be of moderate magnitude.

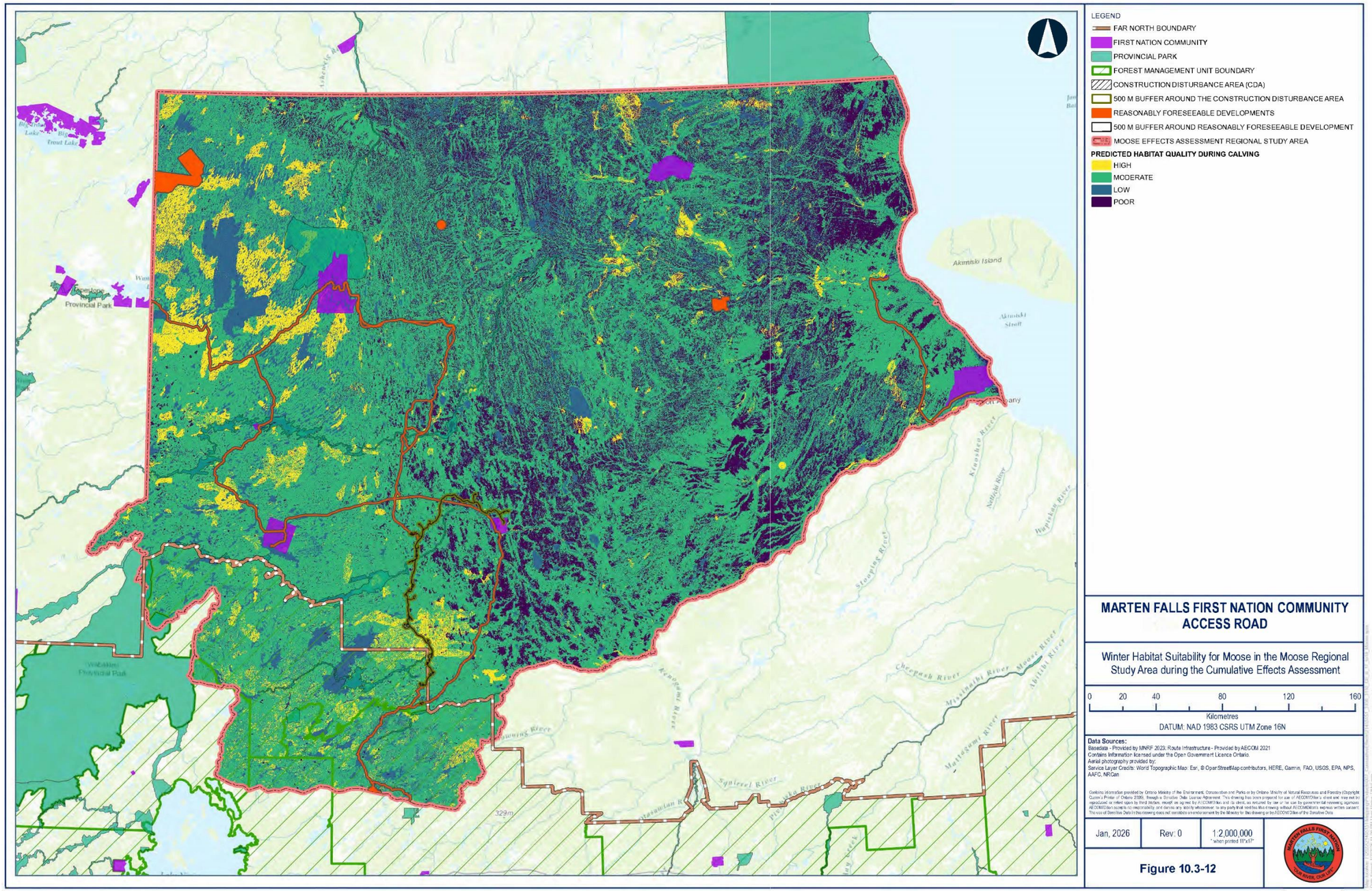
Overall, the cumulative effects from the implementation of the Community Access Road and past, present, and reasonably foreseeable activities may affect boreal caribou habitat connectivity. However, a large amount of suitable habitat will remain undisturbed and connected in the boreal caribou effects assessment Regional Study Area, relative to existing conditions. Given animal movement and habitat use are dynamic over time, the magnitude of effect will likely vary during the lifespan of the projects.

10.3.5.2 Moose

The Community Access Road, past, present, and reasonably foreseeable developments are predicted to have the following cumulative effects on moose:

- Removal of an estimated 64,872 hectares of high, moderate, and low suitability winter moose habitat (combined). This represents a cumulative direct loss of 1.0 percent and 0.4 percent of high and moderate suitability habitat. Winter habitat suitability for moose in the Cumulative Effects Assessment is shown on **Figure 10.3-12**.
- Sensory disturbance (noise, smells, light spill, human presence) are expected to reduce habitat quality and elicit avoidance by moose in proximity of each projects' disturbance footprint. An additional 128,045.7 hectares of high and moderate suitability habitat is predicted to be indirectly disturbed by sensory disturbance.
- Linear disturbances may result in physical and perceived barriers to movement, particularly in the southern and northwestern portion of the moose effects assessment Regional Study Area.
- Introduction of linear corridors expected to be used by predators and the public to facilitate access to areas that are less accessible in the existing environment.
- Introduction of roads (all-season roads, temporary and permanent access roads), are expected to increase the risk of moose collisions with vehicles and equipment.

Figure 10.3-12: Winter Habitat Suitability for Moose in the Moose Regional Study Area during the Cumulative Effects Assessment



- Dust deposition is predicted to degrade vegetation in areas immediately adjacent to the Community Access Road and past, present, and reasonably foreseeable developments.
- Potential for alterations to drainage patterns, and increase or decrease of groundwater levels, thereby affecting moose habitat availability and distribution.

Additionally, climate change may contribute cumulatively to changes in the quality, quantity, and distribution of moose habitat, and moose survival and reproduction. However, the magnitude of change to moose habitat availability, distribution, and survival and reproduction from climate change on moose habitat and populations is uncertain.

Cumulative effects to moose will begin during construction and continue through the operations of the Community Access Road. Effects on moose from the all-season roads and road upgrades will be irreversible as these activities will remain in operation indefinitely. Effects from other developments including transmission lines and mines may be reversible over the long-term if temporary features are reclaimed or left to naturally revegetate.

Overall, the regional moose populations are expected to remain self-sustaining and ecologically effective in the Cumulative Effects Assessment (in other words, there is no predicted change in the assessment endpoints). The anticipated changes to moose habitat availability, distribution, and survival and reproduction from the Community Access Road and past, present, and reasonably foreseeable activities, and climate change are expected to remain within the resilience and adaptability limits of the regional populations.

10.3.5.3 Mitigation Measures

10.3.5.3.1 Boreal Caribou

It is anticipated that the mitigation measures that will be implemented to minimize effects on boreal caribou during the construction, operation, and closure (where applicable) of past, present, and reasonably foreseeable activities will be similar to those implemented for the Community Access Road. Refer to **Section 9.4.5** for a complete description of the proposed mitigation measures for ungulates.

These projects will also be required to meet permitting requirements from the Ministry of Natural Resources and Ministry of Environment, Conservation and Parks, including considerations related to restricted activity timing windows. Indigenous Environmental Monitors would also be expected to be onsite during construction.

Similar to the Community Access Road, it is expected that reasonably foreseeable activities that overlap with the boreal caribou effects assessment Regional Study Area will be required to implement an Environmental Protection Plan and, in some cases, a Biodiversity Offsetti Plan. The offset plan is expected to provide a net increase in functional habitat for boreal caribou. For the boreal caribou Cumulative Effects Assessment, offsetting programs have not been included in the characterization of effects.

It is expected that the effectiveness of mitigation measures for these activities will be evaluated throughout construction, operation, and closure, where applicable, and will be modified or enhanced as necessary through adaptive management.

10.3.5.3.2 Moose

It is expected that the mitigation measures that will be implemented to minimize effects from habitat loss on moose habitat availability, distribution, survival and reproduction from the implementation of past, present, and reasonably foreseeable activities will be similar to those implemented for the Community Access Road. Refer to **Section 9.4.5** for a complete description of the proposed mitigation measures for ungulates.

It is expected that the effectiveness of mitigation measures for these activities will be evaluated throughout construction, operations and closure (where applicable), and will be modified or enhanced as necessary through adaptive management.

10.3.5.4 Determination of Significance

10.3.5.4.1 Boreal Caribou

A conservative approach was applied to the determination of significance on boreal caribou because this assessment was primarily informed by 2 years of recent collar data for boreal caribou; individuals that were targeted for collaring were those that interacted with the ungulate effects assessment Local Study Area in winter 2021. Two years of data is relatively short when compared to the longevity of boreal caribou and acquiring confident knowledge of movement patterns.

Based on the weight of evidence, uncertainty in effects predictions and application of the precautionary approach, changes in habitat availability and distribution and survival and reproduction as a result of the Community Access Road and past, present, and reasonably foreseeable developments could approach or extend beyond the resilience capabilities of one or more boreal caribou population(s) overlapping the boreal caribou effects assessment Regional Study Area. As a result, the combined residual cumulative effects from the Community Access Road and past, present, and reasonably foreseeable developments on boreal caribou and boreal caribou habitat are determined

to have a **significant** influence on self-sustaining and ecologically effective boreal caribou populations in the boreal caribou effects assessment Regional Study Area.

10.3.5.4.2 Moose

Given the uncertainty in the potential increases in non-Indigenous and Indigenous moose harvest and the limited data on current Indigenous harvest levels, it was precautionarily assumed that the effects of increases in public access from past, present, and reasonably foreseeable activities could reach unsustainable levels and lead to decreased resilience and maintenance of the self-sustaining and ecologically effective regional moose population. As such, cumulative residual effects on moose from increase in public access are precautionarily considered **significant.**

However, all other effects pathways from the Community Access Road, and past, present, and reasonably foreseeable activities are not predicted to significantly affect the ability of the regional moose population to remain self-sustaining and ecologically effective (there is no predicted change in the assessment endpoints). As such, all other effects pathways are considered **not significant.**

10.3.6 Physiography, Terrain, and Soils

Three valued components with residual effects were carried forward to the physiography, terrain, and soils Cumulative Effects Assessment:

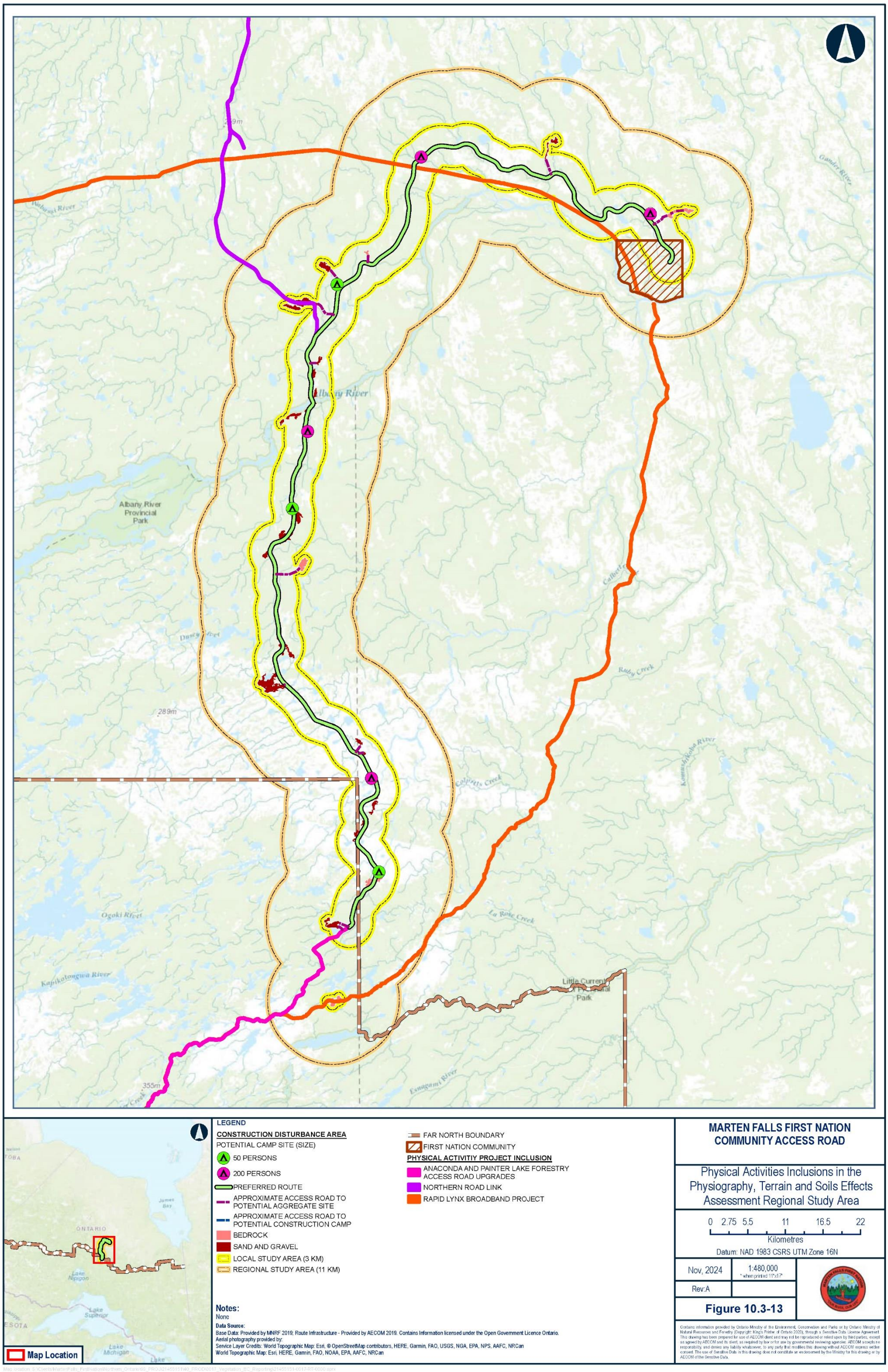
- Changes to terrain quantity and distribution from construction activities;
- Changes to terrain quantity and distribution (esker landforms) from construction activities; and
- Changes to quantity and distribution of soils from construction activities.

The locations of the projects considered for the Cumulative Effects Assessment in relation to the physiography, terrain, and soils Regional Study Area are shown on **Figure 10.3-13**.

10.3.6.1 Changes to Terrain Quantity and Distribution from Construction Activities

Project activities such as clearing, earth moving, excavation at pits and / or blasting at quarry sites, and other road construction activities from the construction of the Community Access Road, Northern Road Link, and Anaconda and Painter Lake Forestry Access Road upgrades have the potential for cumulative effects on the quantity and distribution of terrain through the physical alteration and removal of terrain. Cumulative effects may begin during construction and continue through operation.

Figure 10.3-13: Physical Activities Inclusions in the Physiography, Terrain and Soils Effects Assessment Regional Study Area



It is expected that the Northern Road Link and the Anaconda and Painter Lake Forestry Access Road upgrades would have similar road design as the Community Access Road, and minimize the project footprint, where possible. As a result, the effects from each project on the quantity and distribution of terrain units from construction activities are expected to be minimized and have limited potential for cumulative effects on the quantity and distribution of terrain units.

10.3.6.2 Changes to Terrain Quantity and Distribution (Esker Landforms) from Construction Activities

Project activities such as sand and gravel pit creation and aggregate extraction from the construction of the Northern Road Link and the Anaconda and Painter Lake Forestry Access Road upgrades, along with the Community Access Road, have the potential to cause physical alteration or removal of esker landforms.

The Community Access Road is anticipated to impact 31 percent of the eskers in the Regional Study Area, and the Northern Road Link and Anaconda and Painter Lake Forestry Access Road upgrades are anticipated to cause cumulative changes to the physical alteration of eskers if they are used as sources of road building materials (sand and gravel resources). Cumulative effects may begin during construction and continue through operation. It is anticipated that the Northern Road Link and Anaconda and Painter Lake Forestry Access Road upgrades would minimize or avoid the development of eskers as borrow pits by identifying alternative sources of aggregate such as bedrock quarries or sand and gravel glaciofluvial deposits that are not esker landforms. As a result, the effects from each project would be expected to be minimized and have limited potential for cumulative effects on the quantity and distribution of esker landforms.

10.3.6.3 Changes to Quantity and Distribution of Soils from Construction Activities

Project activities such as clearing, earth moving, excavation at pits and / or blasting at quarry sites and other road construction activities from the Northern Road Link and Anaconda and Painter Lake Forestry Access Road upgrades, along with the Community Access Road, have the potential for cumulative effects on the quantity and distribution of soil. Cumulative effects may begin during construction and continue through operation.

Although the development of the Community Access Road, Northern Road Link, and Anaconda and Painter Lake Forestry Access Road upgrades will permanently disturb landscape within the Regional Study Area, only 1.1 percent of the Regional Study Area is anticipated to be cumulatively disturbed. Therefore, the cumulative effect on changes to terrain and soil quantity and distribution is considered to be negligible.

10.3.6.4 Mitigation Measures

It is anticipated that mitigation measures will be, or have been, implemented to limit changes to physiography, terrain, and soils during the construction and operation of the Northern Road Link and Anaconda and Painter Lake Forestry Access Road upgrades and that these mitigation measures will be similar to those implemented for the Community Access Road. Refer to **Section 9.4.6** for a complete description of the proposed mitigation measures for physiography, terrain, and soils.

10.3.6.5 Determination of Significance

Significance was determined only for disciplines where it was required to meet federal or provincial requirements. For the purposes of this Cumulative Effects Assessment, significance of the effects for physiography, terrain, and soils was not determined.

10.3.7 Summary of Cumulative Effects

Table 10.3-3 summarizes the cumulative effects for the land disciplines.

Table 10.3-3: Summary of Predicted Cumulative Effects for Land Disciplines

Discipline	Valued Component	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Probability of Occurrence	Significance (Significant, Not Significant)	Uncertainty
• **Vegetation**	• Upland Ecosystems	• Changes to ecosystem availability, distribution, composition and function as a result of direct vegetation loss	• Negative	• Low magnitude	• Regional (reasonably foreseeable developments) • Beyond regional (due to climate change)	• Long-term and irreversible (for permanent impacts) • Medium-term and Reversible (for temporary impacts where vegetation communities can and will be restored)	• Continuous	• Irreversible (for permanent impacts) • Reversible (for temporary impacts where vegetation communities can and will be restored)	• Certain (reasonably foreseeable developments) • Probable (climate change)	• Not significant	• Moderate
• **Vegetation**	• Wetland Ecosystems	• Changes to ecosystem availability, distribution, composition and function as a result of direct vegetation loss	• Negative	• Low magnitude	• Regional (reasonably foreseeable developments) • Beyond regional (due to climate change)	• Long-term (for permanent impacts) • Medium-term (for temporary impacts where vegetation communities can and will be restored)	• Continuous	• Irreversible (for permanent impacts) • Reversible (for temporary impacts where vegetation communities can and will be restored)	• Certain (reasonably foreseeable developments) • Probable (climate change)	• Significant	• Moderate
• **Vegetation**	• Riparian Ecosystems	• Changes to ecosystem availability, distribution, composition and function as a result of direct vegetation loss	• Negative	• Low magnitude	• Regional (reasonably foreseeable developments) • Beyond regional (due to climate change)	• Long-term (for permanent impacts) • Medium-term (for temporary impacts where vegetation communities can and will be restored)	• Continuous	• Irreversible (for permanent impacts) • Reversible (for temporary impacts where vegetation communities can and will be restored)	• Certain (reasonably foreseeable developments) • Probable (climate change)	• Not significant	• Moderate
• **Vegetation**	• Designated Areas	• Changes to ecosystem availability, distribution, composition and function as a result of direct vegetation loss	• Negative	• Low magnitude	• Regional (reasonably foreseeable developments) • Beyond regional (due to climate change)	• Long-term (for permanent impacts) • Medium-term (for temporary impacts where vegetation communities can and will be restored)	• Continuous	• Irreversible (for permanent impacts) • Reversible (for temporary impacts where vegetation communities can and will be restored)	• Certain (reasonably foreseeable developments) • Probable (climate change)	• Not significant	• Low (reasonably foreseeable developments) • Moderate (climate change)
• **Vegetation**	• Traditional Use Plants	• Changes to population availability, distribution, composition and function as a result of direct vegetation loss	• Negative	• Low magnitude	• Regional (reasonably foreseeable developments) • Beyond regional (due to climate change)	• Long-term (for permanent impacts) • Medium-term (for temporary impacts where vegetation communities can and will be restored)	• Continuous	• Irreversible (for permanent impacts) • Reversible (for temporary impacts where vegetation communities can and will be restored)	• Certain (reasonably foreseeable developments) • Probable (climate change)	• Not significant	• Moderate
• **Vegetation**	• Species at Risk and Species of Conservation Concern	• Changes to population availability, distribution, composition and function as a result of direct vegetation loss	• Negative	• Low magnitude	• Regional (reasonably foreseeable developments) • Beyond regional (due to climate change)	• Long-term (for permanent impacts) • Medium-term (for temporary impacts where vegetation communities can and will be restored)	• Continuous	• Irreversible (for permanent impacts) • Reversible (for temporary impacts where vegetation communities can and will be restored)	• Certain (reasonably foreseeable developments) • Probable (climate change)	• Not significant	• Moderate

Discipline	Valued Component	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Probability of Occurrence	Significance (Significant, Not Significant)	Uncertainty
Vegetation	Vegetation (all vegetation valued components except Wetland Ecosystems)	Changes to ecosystem or population availability, distribution, composition and function as a result of changes in groundwater during the construction and operations	Negative	Moderate magnitude	Regional	Long-term	Continuous	Irreversible	Probable	Not significant	Moderate
Vegetation	Wetland Ecosystems	Changes to Wetland Ecosystem availability, distribution, composition and function as a result of changes in groundwater	Negative	Medium	Regional	Long-term	Continuous	Irreversible	Probable	Significant	High
Vegetation	Vegetation	Changes to ecosystem or population availability, distribution, composition and function as a result of fragmentation and edge effects during construction	Negative	Negligible	Beyond regional (due to climate change)	Medium-term	Frequent	Irreversible	Probable	Not significant	Moderate
Vegetation	Vegetation	Changes to ecosystem or population availability, distribution, composition and function as a result of fugitive dust emissions during construction and operations	Negative	Negligible	Regional	Long-term	Continuous	Irreversible	Certain	Not significant	Moderate
Wildlife	All wildlife	Fugitive Dust Emissions	Negative	Negligible	Regional	Long-term	Continuous	Irreversible	Probable	Not Significant	Moderate
Wildlife	All wildlife	Changes to Groundwater	Negative	Negligible	Regional	Long-term	Continuous	Irreversible	Probable	Not Significant	Moderate
Wildlife	Bats	Habitat Loss and Alteration	Negative	Low magnitude	Regional	Permanent	Continuous	Irreversible	Certain	Not significant	Moderate
Wildlife	Bats	Sensory Disturbance	Negative	Negligible	Regional	Medium-term (construction) Permanent (operations)	Continuous	Reversible (construction) Irreversible (operations)	Probable	Not significant	Moderate
Wildlife	Furbearers (wolverine)	Habitat Loss and Alteration	Negative	Moderate magnitude	Regional	Permanent	Continuous	Irreversible	Certain	Significant	High
Wildlife	Furbearers (wolverine)	Sensory Disturbance	Negative	Low magnitude	Regional	Medium-term (construction) Permanent (operations)	Continuous	Reversible (construction) Irreversible (operations)	Certain	Not significant	Low
Wildlife	Furbearers (wolverine)	Incidental Take	Negative	Low magnitude	Regional	Medium-term	Infrequent	Irreversible	Possible	Not significant	High

Discipline	Valued Component	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Probability of Occurrence	Significance (Significant, Not Significant)	Uncertainty
• **Wildlife**	• Furbearers (wolverine)	• Collisions with Vehicles and Equipment	• Negative	• Moderate magnitude	• Regional	• Permanent	• Continuous	• Irreversible	• Possible (construction) • Probable (operations)	• Significant	• High
• **Wildlife**	• Furbearers (wolverine)	• Increase in Public Access	• Negative	• Low magnitude	• Regional	• Permanent	• Continuous	• Irreversible	• Possible	• Not significant	• High
• **Wildlife**	• Furbearers (American marten)	• Habitat Loss and Alteration	• Negative	• Low magnitude	• Regional	• Permanent	• Continuous	• Irreversible	• Certain	• Not significant	• Low
• **Wildlife**	• Furbearers (American marten)	• Sensory Disturbance	• Negative	• Low magnitude	• Regional	• Medium-term (construction) • Permanent (operations)	• Continuous	• Reversible (construction) • Irreversible (operations)	• Probable	• Not significant	• Low
• **Wildlife**	• Furbearers (American marten)	• Incidental Take	• Negative	• Low magnitude	• Regional	• Medium-term	• Infrequent	• Irreversible	• Possible	• Not significant	• High
• **Wildlife**	• Furbearers (American marten)	• Increase in Public Access	• Negative	• Low magnitude	• Regional	• Permanent	• Continuous	• Irreversible	• Possible	• Not significant	• High
• **Wildlife**	• Furbearers (beaver)	• Habitat Loss and Alteration	• Negative	• Negligible	• Regional	• Permanent	• Continuous	• Irreversible	• Certain	• Not significant	• Low
• **Wildlife**	• Furbearers (beaver)	• Increase in Public Access	• Negative	• Low magnitude	• Regional	• Permanent	• Continuous	• Irreversible	• Possible	• Not significant	• High
• **Wildlife**	• Reptiles and amphibians	• Habitat Loss and Alteration	• Negative	• Low magnitude	• Regional	• Permanent	• Continuous	• Irreversible	• Certain	• Significance of cumulative effects not determined for this valued component	• Low
• **Wildlife**	• Reptiles and amphibians	• Sensory Disturbance	• Negative	• Negligible	• Regional	• Medium-term (construction) • Permanent (operations)	• Continuous	• Reversible (construction) • Irreversible (operations)	• Probable	• Significance of cumulative effects not determined for this valued component	• Low
• **Wildlife**	• Reptiles and amphibians	• Incidental Take	• Negative	• Low magnitude	• Regional	• Medium-term	• Infrequent	• Irreversible	• Probable	• Significance of cumulative effects not determined for this valued component	• Low
• **Wildlife**	• Reptiles and amphibians	• Collisions with Vehicles and Equipment	• Negative	• Low magnitude	• Regional	• Permanent	• Continuous	• Irreversible	• Probable (construction) • Certain (operations)	• Significance of cumulative effects not determined for this valued component	• Moderate
• **Wildlife**	• Pollinating insects	• Habitat Loss and Alteration	• Negative	• Negligible	• Regional	• Permanent	• Continuous	• Irreversible	• Certain	• Significance of cumulative effects not determined for this valued component	• Low

Discipline	Valued Component	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Probability of Occurrence	Significance (Significant, Not Significant)	Uncertainty
• **Wildlife**	• Pollinating insects	• Incidental Take	• Negative	• Negligible	• Regional	• Medium-term	• Infrequent	• Irreversible	• Probable	• Significance of cumulative effects not determined for this valued component	• Low
• **Wildlife**	• Pollinating insects	• Collisions with Vehicles and Equipment	• Negative	• Negligible	• Regional	• Permanent	• Continuous	• Irreversible	• Probable	• Significance of cumulative effects not determined for this valued component	• Low
• **Wildlife - Birds**	• All birds	• Changes to Groundwater	• Negative	• Negligible	• Regional	• Long-term	• Continuous	• Irreversible	• Probable	• Not significant	• Moderate
• **Wildlife - Birds**	• All birds	• Dust Deposition	• Negative	• Negligible	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Certain	• Not significant	• Low
• **Wildlife - Birds**	• Red-eyed Vireo	• Habitat Loss and Alteration	• Negative (reasonably foreseeable developments) • Neutral to Positive (climate change)	• Low magnitude	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Certain for habitat availability and survival and reproduction • Probable for habitat distribution • Possible for climate change	• Not significant	• Low
• **Wildlife - Birds**	• Red-eyed Vireo	• Sensory Disturbance	• Negative	• Low magnitude	• Beyond Regional	• Medium-term (construction of reasonably foreseeable developments) • Long-term (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Infrequent	• Reversible (construction of reasonably foreseeable developments) • Irreversible (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Probable	• Not significant	• Low
• **Wildlife - Birds**	• Ovenbird	• Habitat Loss and Alteration	• Negative	• Low magnitude	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Certain for habitat availability and survival and reproduction • Probable for habitat distribution • Possible for climate change	• Not significant (reasonably foreseeable developments) • Significant (climate change; if temperatures increase by 3.0 degrees Celsius relative to current conditions).	• Low (reasonably foreseeable developments) • Moderate (climate change)

Discipline	Valued Component	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Probability of Occurrence	Significance (Significant, Not Significant)	Uncertainty
• **Wildlife - Birds**	• Ovenbird	• Sensory Disturbance	• Negative	• Low magnitude	• Regional (construction and operation of the Rapid Lynx Broadband project) • Beyond Regional (construction and operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Medium-term (construction and operation of reasonably foreseeable developments) • Long-term (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Infrequent (maintenance of the Rapid Lynx Broadband project) • Frequent (construction of reasonably foreseeable developments) • Continuous (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Reversible (construction and operation of reasonably foreseeable developments) • Irreversible (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Probable	• Not significant	• Low
• **Wildlife - Birds**	• Ovenbird	• Increase in Edge Habitat	• Negative	• Low magnitude	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Probable	• Not significant	• Moderate
• **Wildlife - Birds**	• Dark-eyed Junco	• Habitat Loss and Alteration	• Negative	• High magnitude	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Certain for habitat availability and survival and reproduction • Probable for habitat distribution and climate change	• Not significant (reasonably foreseeable developments) • Significant (climate change; if temperatures increase by 1.5 degrees Celsius to 3.0 degrees Celsius relative to current conditions).	• Low (reasonably foreseeable developments) • Moderate (climate change)
• **Wildlife - Birds**	• Dark-eyed Junco	• Sensory Disturbance	• Negative	• Low magnitude	• Regional (construction and operation of the Rapid Lynx Broadband project) • Beyond Regional (construction and operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Medium-term (construction and operation of reasonably foreseeable developments) • Long-term (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Infrequent (maintenance of the Rapid Lynx Broadband project) • Frequent (construction of reasonably foreseeable developments) • Continuous (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Reversible (construction and operation of reasonably foreseeable developments) • Irreversible (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Probable	• Not significant	• Low

Discipline	Valued Component	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Probability of Occurrence	Significance (Significant, Not Significant)	Uncertainty
• **Wildlife - Birds**	• Osprey	• Habitat Loss and Alteration	• Negative	• Low magnitude	• Beyond Regional	• Long-term / Irreversible	• Continuous	• Irreversible	• Certain for habitat availability and survival and reproduction • Probable for habitat distribution • Possible for climate change	• Not significant	• Low (reasonably foreseeable developments) • Moderate (climate change)
• **Wildlife - Birds**	• Osprey	• Sensory Disturbance	• Negative	• Low magnitude	• Regional (construction and operation of the Rapid Lynx Broadband project) • Beyond Regional (construction and operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Medium-term (construction and operation of reasonably foreseeable developments) • Long-term (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Infrequent (maintenance of the Rapid Lynx Broadband project) • Frequent (construction of reasonably foreseeable developments) • Continuous (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Reversible (construction and operation of reasonably foreseeable developments) • Irreversible (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Possible	• Not significant	• Low
• **Wildlife - Birds**	• Boreal Owl	• Habitat Loss and Alteration	• Negative	• Low magnitude	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Certain for habitat availability and survival and reproduction • Probable for habitat distribution and climate change	• Not significant (reasonably foreseeable developments) • Significant (climate change; if temperatures increase by 1.5 degrees Celsius to 3.0 degrees Celsius relative to current conditions).	• Low (reasonably foreseeable developments) • Moderate (climate change)

Discipline	Valued Component	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Probability of Occurrence	Significance (Significant, Not Significant)	Uncertainty
• **Wildlife - Birds**	• Wilson's Snipe	• Habitat Loss and Alteration	• Negative	• Low magnitude	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Certain for habitat availability and survival and reproduction • Probable for habitat distribution and climate change	• Not significant (reasonably foreseeable developments) • Significant (climate change; if temperatures increase by 1.5 degrees Celsius to 3.0 degrees Celsius relative to current conditions).	• Low (reasonably foreseeable developments) • Moderate (climate change)
• **Wildlife - Birds**	• Wilson's Snipe	• Sensory Disturbance	• Negative	• Low magnitude	• Regional (construction and operation of the Rapid Lynx Broadband project) • Beyond Regional (construction and operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Medium-term (construction and operation e of reasonably foreseeable developments) • Long-term (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Infrequent (maintenance of the Rapid Lynx Broadband project) • Frequent (construction of reasonably foreseeable developments) • Continuous (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Reversible (construction and operation of reasonably foreseeable developments) • Irreversible (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Probable	• Not significant	• Low
• **Wildlife - Birds**	• Mallard	• Habitat Loss and Alteration	• Negative	• Low magnitude	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Certain for habitat availability and survival and reproduction • Probable for habitat distribution • Possible for climate change	• Not significant	• Low

Discipline	Valued Component	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Probability of Occurrence	Significance (Significant, Not Significant)	Uncertainty
• **Wildlife - Birds**	• Mallard	• Sensory Disturbance	• Negative	• Low magnitude	• Regional (construction and operation of the Rapid Lynx Broadband project) • Beyond Regional (construction and operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Medium-term (construction and operation of reasonably foreseeable developments) • Long-term (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Infrequent (maintenance of the Rapid Lynx Broadband project) • Frequent (construction of reasonably foreseeable developments) • Continuous (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Reversible (construction and operation of reasonably foreseeable developments) • Irreversible (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Probable	• Not significant	• Low
• **Wildlife - Birds**	• Palm Warbler	• Habitat Loss and Alteration	• Negative	• Low magnitude	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Certain for habitat availability and survival and reproduction • Probable for habitat distribution and climate change	• Not significant (reasonably foreseeable developments) • Significant (climate change; if temperatures increase by 1.5 degrees Celsius to 3.0 degrees Celsius relative to current conditions).	• Low (reasonably foreseeable developments) • Moderate (climate change)
• **Wildlife - Birds**	• Palm Warbler	• Sensory Disturbance	• Negative	• Low magnitude	• Regional (construction and operation of the Rapid Lynx Broadband project) • Beyond Regional (construction and operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Medium-term (construction and operation of reasonably foreseeable developments) • Long-term (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Infrequent (maintenance of the Rapid Lynx Broadband project) • Frequent (construction of reasonably foreseeable developments) • Continuous (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Reversible (construction and operation of reasonably foreseeable developments) • Irreversible (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Probable	• Not significant	• Low

Discipline	Valued Component	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Probability of Occurrence	Significance (Significant, Not Significant)	Uncertainty
• **Wildlife - Birds**	• Palm Warbler	• Increase in Edge Habitat	• Negative	• Low magnitude	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Probable	• Not significant	• Moderate
• **Wildlife - Birds**	• Common Yellowthroat	• Habitat Loss and Alteration	• Negative	• Low magnitude	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Certain for habitat availability and survival and reproduction • Probable for habitat distribution • Possible for climate change	• Not significant	• Low (reasonably foreseeable developments) • Moderate (climate change)
• **Wildlife - Birds**	• Common Yellowthroat	• Sensory Disturbance	• Negative	• Low magnitude	• Regional (construction and operation of the Rapid Lynx Broadband project) • Beyond Regional (construction and operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Medium-term / Reversible (construction and operation of reasonably foreseeable developments) • Long-term / Irreversible (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Infrequent (maintenance of the Rapid Lynx Broadband project) • Frequent (construction of reasonably foreseeable developments) • Continuous (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Reversible (construction and operation of reasonably foreseeable developments) • Irreversible (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Probable	• Not significant	• Low
• **Wildlife - Birds**	• Northern Waterthrush	• Habitat Loss and Alteration	• Negative	• Low magnitude	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Certain for habitat availability and survival and reproduction • Probable for habitat distribution • Possible for climate change	• Not significant (reasonably foreseeable developments) • Significant (climate change; if temperatures increase by 3.0 degrees Celsius relative to current conditions).	• Low (reasonably foreseeable developments) • Moderate (climate change)

Discipline	Valued Component	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Probability of Occurrence	Significance (Significant, Not Significant)	Uncertainty
• **Wildlife - Birds**	• Northern Waterthrush	• Sensory Disturbance	• Negative	• Low magnitude	• Regional (construction and operation of the Rapid Lynx Broadband project) • Beyond Regional (construction and operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Medium-term (construction and operation of reasonably foreseeable developments) • Long-term (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Infrequent (maintenance of the Rapid Lynx Broadband project) • Frequent (construction of reasonably foreseeable developments) • Continuous (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Reversible (construction and operation of reasonably foreseeable developments) • Irreversible (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Probable	• Not significant	• Low
• **Wildlife - Birds**	• Northern Waterthrush	• Increase in Edge Habitat	• Negative	• Low magnitude	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Probable	• Not significant	• Moderate
• **Wildlife - Birds**	• Sora	• Habitat Loss and Alteration	• Negative	• High magnitude	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Certain for habitat availability and survival and reproduction • Probable for habitat distribution and climate change	• Not significant (reasonably foreseeable developments) • Significant (climate change; if temperatures increase by 3.0 degrees Celsius relative to current conditions).	• Low (reasonably foreseeable developments) • Moderate (climate change)
• **Wildlife - Birds**	• Sora	• Sensory Disturbance	• Negative	• Low magnitude	• Regional (construction and operation of the Rapid Lynx Broadband project) • Beyond Regional (construction and operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Medium-term (construction and operation of reasonably foreseeable developments) • Long-term (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Infrequent (maintenance of the Rapid Lynx Broadband project) • Frequent (construction of reasonably foreseeable developments) • Continuous (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Reversible (construction and operation of reasonably foreseeable developments) • Irreversible (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Probable	• Not significant	• Low

Discipline	Valued Component	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Probability of Occurrence	Significance (Significant, Not Significant)	Uncertainty
• **Wildlife - Birds**	• Canada Warbler	• Habitat Loss and Alteration	• Negative	• High magnitude	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Certain for habitat availability and survival and reproduction • Probable for habitat distribution and climate change	• Not significant (reasonably foreseeable developments) • Significant (climate change; if temperatures increase by 2.0 degrees Celsius to 3.0 degrees Celsius relative to current conditions).	• Low (reasonably foreseeable developments) • Moderate (climate change)
• **Wildlife - Birds**	• Canada Warbler	• Sensory Disturbance	• Negative	• Low magnitude	• Regional (construction and operation of the Rapid Lynx Broadband project) • Beyond Regional (construction and operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Medium-term (construction and operation of reasonably foreseeable developments) • Long-term (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Infrequent (maintenance of the Rapid Lynx Broadband project) • Frequent (construction of reasonably foreseeable developments) • Continuous (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Reversible (construction and operation of reasonably foreseeable developments) • Irreversible (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Probable	• Not significant	• Low
• **Wildlife - Birds**	• Evening Grosbeak	• Habitat Loss and Alteration	• Negative	• High magnitude	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Certain for habitat availability and survival and reproduction • Probable for habitat distribution and climate change	• Not significant (reasonably foreseeable developments) • Significant (climate change; if temperatures increase by 3.0 degrees Celsius relative to current conditions).	• Low (reasonably foreseeable developments) • Moderate (climate change)

Discipline	Valued Component	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Probability of Occurrence	Significance (Significant, Not Significant)	Uncertainty
• **Wildlife - Birds**	• Evening Grosbeak	• Sensory Disturbance	• Negative	• Low magnitude	• Regional (construction and operation of the Rapid Lynx Broadband project) • Beyond Regional (construction and operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Medium-term (construction and operation of reasonably foreseeable developments) • Long-term (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Infrequent (maintenance of the Rapid Lynx Broadband project) • Frequent (construction of reasonably foreseeable developments) • Continuous (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Reversible (construction and operation of reasonably foreseeable developments) • Irreversible (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Probable	• Not significant	• Low
• **Wildlife - Birds**	• Chimney Swift, Bank Swallow, and Barn Swallow	• Habitat Loss and Alteration	• Negative	• Low magnitude	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Certain for habitat availability and survival and reproduction • Probable for habitat distribution and climate change	• Not significant	• Low (reasonably foreseeable developments) • Moderate (climate change)
• **Wildlife - Birds**	• Chimney Swift, Bank Swallow, and Barn Swallow	• Sensory Disturbance	• Negative	• Low magnitude	• Regional (construction and operation of the Rapid Lynx Broadband project) • Beyond Regional (construction and operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Medium-term (construction and operation of reasonably foreseeable developments) • Long-term (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Infrequent (maintenance of the Rapid Lynx Broadband project) • Frequent (construction of reasonably foreseeable developments) • Continuous (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Reversible (construction and operation of reasonably foreseeable developments) • Irreversible (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Probable	• Not significant	• Low
• **Wildlife - Birds**	• Common Nighthawk and Eastern Whip-poor-will	• Habitat Loss and Alteration	• Negative	• Low magnitude	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Certain for habitat availability and survival and reproduction • Probable for habitat distribution and climate change	• Not significant • Significant (climate change for eastern whip-poor-will)	• Low (reasonably foreseeable developments) • Moderate (climate change)

Discipline	Valued Component	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Probability of Occurrence	Significance (Significant, Not Significant)	Uncertainty
• **Wildlife - Birds**	• Common Nighthawk and Eastern Whip-poor-will	• Sensory Disturbance	• Negative	• Low magnitude	• Regional (construction and operation of the Rapid Lynx Broadband project) • Beyond Regional (construction and operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Medium-term (construction and operation of reasonably foreseeable developments) • Long-term (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Infrequent (maintenance of the Rapid Lynx Broadband project) • Frequent (construction of reasonably foreseeable developments) • Continuous (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Reversible (construction and operation of reasonably foreseeable developments) • Irreversible (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Probable	• Not significant	• Low
• **Wildlife - Birds**	• Common Nighthawk and Eastern Whip-poor-will	• Increase in Edge Habitat	• Negative	• Low magnitude	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Probable	• Not significant	• Moderate
• **Wildlife - Birds**	• Eastern Wood-Pewee	• Habitat Loss and Alteration	• Negative	• Low magnitude	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Certain for habitat availability and survival and reproduction • Probable for habitat distribution and climate change	• Not significant •	• Low (reasonably foreseeable developments) • Moderate (climate change)
• **Wildlife - Birds**	• Eastern Wood-Pewee	• Sensory Disturbance	• Negative	• Low magnitude	• Regional (construction and operation of the Rapid Lynx Broadband project) • Beyond Regional (construction and operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Medium-term (construction and operation of reasonably foreseeable developments) • Long-term (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Infrequent (maintenance of the Rapid Lynx Broadband project) • Frequent (construction of reasonably foreseeable developments) • Continuous (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Reversible (construction and operation of reasonably foreseeable developments) • Irreversible (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Probable	• Not significant	• Low

Discipline	Valued Component	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Probability of Occurrence	Significance (Significant, Not Significant)	Uncertainty
• **Wildlife - Birds**	• Olive-sided Flycatcher	• Habitat Loss and Alteration	• Negative	• Low magnitude	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Certain for habitat availability and survival and reproduction • Probable for habitat distribution and climate change	• Not significant (reasonably foreseeable developments) • Significant (climate change; if temperatures increase by 1.5 degrees Celsius to 3.0 degrees Celsius relative to current conditions).	• Low (reasonably foreseeable developments) • Moderate (climate change)
• **Wildlife - Birds**	• Olive-sided Flycatcher	• Sensory Disturbance	• Negative	• Low magnitude	• Regional (construction and operation of the Rapid Lynx Broadband project) • Beyond Regional (construction and operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Medium-term (construction and operation of reasonably foreseeable developments) • Long-term (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Infrequent (maintenance of the Rapid Lynx Broadband project) • Frequent (construction of reasonably foreseeable developments) • Continuous (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Reversible (construction and operation of reasonably foreseeable developments) • Irreversible (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Probable	• Not significant	• Low
• **Wildlife - Birds**	• Bald Eagle	• Habitat Loss and Alteration	• Negative	• Low magnitude	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Certain for habitat availability and survival and reproduction • Probable for habitat distribution and climate change	• Not significant	• Low (reasonably foreseeable developments) • Moderate (climate change)

Discipline	Valued Component	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Probability of Occurrence	Significance (Significant, Not Significant)	Uncertainty
• **Wildlife - Birds**	• Bald Eagle	• Sensory Disturbance	• Negative	• Low magnitude	• Regional (construction and operation of the Rapid Lynx Broadband project) • Beyond Regional (construction and operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Medium-term (construction and operation of reasonably foreseeable developments) • Long-term (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Infrequent (maintenance of the Rapid Lynx Broadband project) • Frequent (construction of reasonably foreseeable developments) • Continuous (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Reversible (construction and operation of reasonably foreseeable developments) • Irreversible (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Probable	• Not significant	• Low
• **Wildlife - Birds**	• Short-eared Owl	• Habitat Loss and Alteration	• Negative	• Low magnitude	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Certain for habitat availability and survival and reproduction • Probable for habitat distribution and climate change	• Not significant (reasonably foreseeable developments) • Significant (climate change; if temperatures increase by 1.5 degrees Celsius to 3.0 degrees Celsius relative to current conditions).	• Low (reasonably foreseeable developments) • Moderate (climate change)
• **Wildlife - Birds**	• Short-eared Owl	• Sensory Disturbance	• Negative	• Low magnitude	• Regional (construction and operation of the Rapid Lynx Broadband project) • Beyond Regional (construction and operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Medium-term (construction and operation of reasonably foreseeable developments) • Long-term (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Infrequent (maintenance of the Rapid Lynx Broadband project) • Frequent (construction of reasonably foreseeable developments) • Continuous (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Reversible (construction and operation of reasonably foreseeable developments) • Irreversible (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Probable	• Not significant	• Low

Discipline	Valued Component	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Probability of Occurrence	Significance (Significant, Not Significant)	Uncertainty
• **Wildlife - Birds**	• Short-eared Owl	• Increase in Edge Habitat	• Negative	• Low magnitude	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Probable	• Not significant	• Moderate
• **Wildlife - Birds**	• Lesser Yellowlegs	• Habitat Loss and Alteration	• Negative	• Low magnitude	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Certain for habitat availability and survival and reproduction • Probable for habitat distribution and climate change	• Not significant (reasonably foreseeable developments) • Significant (climate change; if temperatures increase by 1.5 degrees Celsius to 3.0 degrees Celsius relative to current conditions).	• Low (reasonably foreseeable developments) • Moderate (climate change)
• **Wildlife - Birds**	• Lesser Yellowlegs	• Sensory Disturbance	• Negative	• Low magnitude	• Regional (construction and operation of the Rapid Lynx Broadband project) • Beyond Regional (construction and operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Medium-term (construction and operation of reasonably foreseeable developments) • Long-term (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Infrequent (maintenance of the Rapid Lynx Broadband project) • Frequent (construction of reasonably foreseeable developments) • Continuous (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Reversible (construction and operation of reasonably foreseeable developments) • Irreversible (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Probable	• Not significant	• Low
• **Wildlife - Birds**	• Rusty Blackbird	• Habitat Loss and Alteration	• Negative	• Moderate to High magnitude	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Certain for habitat availability and survival and reproduction • Probable for habitat distribution and climate change	• Not significant (reasonably foreseeable developments) • Significant (climate change; if temperatures increase by 1.5 degrees Celsius to 3.0 degrees Celsius relative to current conditions).	• Low (reasonably foreseeable developments) • Moderate (climate change)

Discipline	Valued Component	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Probability of Occurrence	Significance (Significant, Not Significant)	Uncertainty
• **Wildlife - Birds**	• Rusty Blackbird	• Sensory Disturbance	• Negative	• Low magnitude	• Regional (construction and operation of the Rapid Lynx Broadband project) • Beyond Regional (construction and operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Medium-term (construction and operation of reasonably foreseeable developments) • Long-term (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Infrequent (maintenance of the Rapid Lynx Broadband project) • Frequent (construction of reasonably foreseeable developments) • Continuous (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Reversible (construction and operation of reasonably foreseeable developments) • Irreversible (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Probable	• Not significant	• Low
• **Wildlife - Birds**	• Rusty Blackbird	• Increase in Edge Habitat	• Negative	• Low magnitude	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Probable	• Not significant	• Moderate
• **Wildlife - Birds**	• Yellow Rail	• Habitat Loss and Alteration	• Negative	• High magnitude	• Beyond Regional	• Long-term	• Continuous	• Irreversible	• Certain for habitat availability and survival and reproduction • Probable for habitat distribution and climate change	• Not significant (reasonably foreseeable developments) • Significant (climate change; if temperatures increase by 1.5 degrees Celsius to 3.0 degrees Celsius relative to current conditions).	• Low (reasonably foreseeable developments) • Moderate (climate change)
• **Wildlife - Birds**	• Yellow Rail	• Sensory Disturbance	• Negative	• Moderate magnitude	• Regional (construction and operation of the Rapid Lynx Broadband project) • Beyond Regional (construction and operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Medium-term (construction and operation of reasonably foreseeable developments) • Long-term (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Infrequent (maintenance of the Rapid Lynx Broadband project) • Frequent (construction of reasonably foreseeable developments) • Continuous (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Reversible (construction and operation of reasonably foreseeable developments) • Irreversible (operations of the Community Access Road, the Northern Road Link, and upgraded Anaconda and Painter Lake forestry roads)	• Probable	• Not significant	• Low

Discipline	Valued Component	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Probability of Occurrence	Significance (Significant, Not Significant)	Uncertainty
• **Ungulates**	• Boreal Caribou	• Habitat Loss and Alteration	• Negative	• Low magnitude in Missisa, Ozhiski and Pagwachuan ranges • Moderate magnitude in Nipigon range	• Regional for habitat availability and survival and reproduction. • Beyond regional for habitat distribution (boreal caribou movement and connectivity) and climate change.	• Long-term	• Continuous	• Irreversible	• Certain (reasonably foreseeable developments) • Probable (climate change)	• Not significant	• Low for habitat availability and survival and reproduction. • High for habitat distribution (boreal caribou movement and connectivity) and climate change.
• **Ungulates**	• Boreal Caribou	• Sensory Disturbance	• Negative	• Low magnitude	• Regional	• Long-term	• Continuous (construction of all reasonably foreseeable developments, and operations of the all-season roads, upgraded roads, Eagle's Nest Project Mine) • Infrequent (operations of the Rapid Lynx Broadband project, Wataynikaniyap Powerline)	• Irreversible (although sensory disturbance from some reasonably foreseeable developments may be reversible after closure)	• Certain during construction of each project; • Probable during operation of each project.	• Not significant	• Moderate
• **Ungulates**	• Boreal Caribou	• Linear barriers	• Negative	• High magnitude in the Missisa range • Moderate magnitude in the Ozhiski range • Low magnitude in the Nipigon range • Negligible magnitude in the Pagwachuan range	• Regional for habitat availability • Beyond regional for habitat distribution and survival and reproduction (habitat and population connectivity and animal movement)	• Long-term	• Continuous	• Irreversible (for the all-season roads and permanent access roads) • Reversible (for access roads and utility corridors that will be revegetated)	• Probable	• Not significant	• High

Discipline	Valued Component	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Probability of Occurrence	Significance (Significant, Not Significant)	Uncertainty
• **Ungulates**	• Boreal Caribou	• Increased predator access	• Negative	• Negligible magnitude	• Regional	• Long-term (for the all-season roads, permanent access roads, and utility corridors) • Medium-term (for access roads that will be revegetated)	• Continuous	• Irreversible	• Probable	• Not significant	• Moderate
• **Ungulates**	• Boreal Caribou	• Increase in public access	• Negative	• Low magnitude	• Regional	• Long-term	• Continuous	• Irreversible	• Possible	• Not significant	• High
• **Ungulates**	• Boreal Caribou	• Collisions with vehicles and equipment	• Negative	• Moderate magnitude	• Regional	• Long-term	• Continuous	• Irreversible	• Possible (during construction of reasonably foreseeable developments) • Probable (during operations of reasonably foreseeable developments)	• Not significant	• Low (Construction) • High (Operations)
• **Ungulates**	• Boreal Caribou	• Fugitive dust emissions	• Negative	• Negligible magnitude	• Regional	• Long-term	• Continuous	• Irreversible	• Certain	• Not significant	• Low
• **Ungulates**	• Boreal Caribou	• Changes to Groundwater	• Negative	• Negligible magnitude	• Regional	• Long-term	• Continuous	• Irreversible	• Probable	• Not significant	• Moderate
• **Ungulates**	• Moose	• Habitat loss and alteration	• Negative	• Low magnitude	• Regional for changes associated with the Community Access Road and past, present, and reasonably foreseeable developments • Beyond Regional for changes associated with climate change	• Long-term	• Continuous	• Irreversible	• Certain (habitat availability) • Probable (habitat distribution, survival and reproduction) • Probable for changes associated with climate change	• Not significant	• Low (habitat availability, survival and reproduction) • Moderate (habitat distribution) • High for changes associated with climate change
• **Ungulates**	• Moose	• Sensory disturbance	• Negative	• Low magnitude	• Regional (localized around the Community Access Road and past, present, and reasonably foreseeable activities)	• Long-term	• Continuous •	• Irreversible / Reversible if moose habituate to vehicle traffic throughout the lifetime of these activities	• Certain (Habitat availability) • Probable (Habitat distribution, survival and reproduction)	• Not significant	• Low (habitat availability and survival and reproduction) • Moderate (habitat distribution)

Discipline	Valued Component	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Probability of Occurrence	Significance (Significant, Not Significant)	Uncertainty
• **Ungulates**	• Moose	• Linear barriers	• Negative	• Low magnitude	• Regional for habitat availability and survival and reproduction (localized within and around the Community Access Road and reasonably foreseeable activities that will introduce linear disturbance) • Beyond regional for habitat distribution (habitat connectivity and movement)	• Long-term	• Continuous	• Irreversible for permanent linear corridors and disturbances • Reversible for temporary linear features that will be decommissioned and / or reclaimed or left to revegetate (decommissioned access roads, rights-of-way)	• Probable	• Not significant	• Moderate
• **Ungulates**	• Moose	• Increased predator access	• Negative	• Low magnitude	• Regional (localized within and around the Community Access Road and reasonably foreseeable activities that will introduce linear disturbance)	• Long-term	• Continuous	• Irreversible for activities with permanent linear corridors (all-season roads, permanent access roads, utility projects) • Reversible for temporary linear features that will be reclaimed or left to revegetate naturally (decommissioned access roads)	• Probable	• Not significant	• Moderate
• **Ungulates**	• Moose	• Increase in public access	• Negative	• High magnitude	• Regional (localized around the Community Access Road and reasonably foreseeable activities that will introduce linear disturbance, but effects could extend regionally)	• Long-term	• Continuous	• Irreversible	• Probable	• Significant	• High
• **Ungulates**	• Moose	• Collisions with vehicles and equipment	• Negative	• Negligible magnitude during construction • Moderate magnitude during operations	• Regional (localized on the project footprints of the Community Access Road, past, present, and reasonably foreseeable activities)	• Long-term	• Continuous	• Irreversible	• Possible (construction and closure (if applicable) of the Community Access Road and past, present, and reasonably foreseeable developments) • Probable (operations of the Community Access Road and other projects that have operational roads)	• Not significant	• Low (construction and closure of the Community Access Road and all past, present, and reasonably foreseeable developments) • High (operations of the Community Access Road and other projects that have operational roads)

Discipline	Valued Component	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Probability of Occurrence	Significance (Significant, Not Significant)	Uncertainty
• **Ungulates**	• Moose	• Fugitive dust emissions	• Negative	• Negligible magnitude	• Regional (localized around the project footprints of the Community Access Road, past, present, and reasonably foreseeable activities)	• Long-term	• Continuous	• Irreversible	• Certain	• Not significant	• Low
• **Ungulates**	• Moose	• Changes to groundwater	• Negative	• Negligible magnitude	• Regional	• Long-term	• Continuous	• Irreversible	• Probable	• Not significant	• Moderate
• **Physiography, Terrain and Soils**	• Changes to Terrain Quality and Distribution	• Changes to Terrain Quality and Distribution from Construction Activities	• Negative	• Negligible	• Regional Study Area	• Long-term	• Infrequent	• Irreversible	• Certain	• Not applicable	• Moderate
• **Physiography, Terrain and Soils**	• Changes to Esker Landforms	• Changes to Esker Landforms from Construction Activities	• Negative	• Medium	• Regional Study Area	• Long-term	• Infrequent	• Irreversible	• Possible	• Not applicable	• Moderate
• **Physiography, Terrain and Soils**	• Changes to Quantity and Distribution of Soils	• Changes to Quantity and Distribution of Soils from Construction Activities	• Negative	• Negligible	• Regional Study Area	• Long-term	• Infrequent	• Irreversible	• Certain	• Not applicable	• Moderate

10.4 People

10.4.1 Scoping

Where residual effects identified in **Section 9** were negligible magnitude, unlikely or possible to occur, or positive in direction, the effect was not carried forward into the Cumulative Effects Assessment. The valued components with residual effects that have been carried forward for the Cumulative Effects Assessment for people disciplines are described in **Table 10.4-1.**

To determine the spatial boundaries of potential cumulative effects, the projects listed in **Table 10.4-2** were considered for the Cumulative Effects Assessment. The remainder of the projects on the Project Inclusions List were determined to have no spatial or temporal overlap with the people disciplines study areas; therefore, they were not considered as part of the Cumulative Effects Assessment.

Table 10.4-1: Valued Components Carried Forward and Corresponding Spatial and Temporal Boundary for People Disciplines

Discipline	Valued Component	Spatial Boundary	Temporal Boundary
• **Aboriginal and Treaty Rights and Interests**	• Indigenous Current Use of Land and Resources for Traditional Purposes	• Aboriginal and / or Treaty Rights and Interests Boreal Caribou Regional Study Area.	• Construction • Operations
• **Aboriginal and Treaty Rights and Interests**	• Cultural Continuity and Well-being	• Aboriginal and / or Treaty Rights and Interests Boreal Caribou Regional Study Area.	• Construction • Operations
• **Acoustic and Vibration**	• Noise	• Construction Disturbance Area plus a 4-kilometre buffer.	• Construction • Operation
• **Acoustic and Vibration**	• Vibration	• Construction Disturbance Area plus a 4-kilometre buffer.	• Construction • Operation
• **Archaeology**	• Not Applicable	• Not Applicable	• Not Applicable
• **Atmospheric**	• Air Quality	• Construction Disturbance Area plus a 12.3-kilometre buffer.	• Congruent periods of emissions between the Community Access Road construction or operation and other projects within the spatial boundary (emissions occurring at the same time from multiple projects)
• **Greenhouse Gas**	• Not Applicable	• Not Applicable	• Not Applicable
• **Cultural Heritage**	• Not Applicable	• Not Applicable	• Not Applicable
• **Community Well-Being**	• Community Access to Infrastructure and Services	• Local Study Area (Marten Falls First Nation; Aroland First Nation).	• Construction
• **Community Well-Being**	• Cultural Preservation and Change	• Local Study Area (Marten Falls First Nation; Aroland First Nation; Indigenous Communities with Overlapping Interests).	• Construction and operation
• **Community Well-Being**	• Community and Public Health	• Local Study Area (Marten Falls First Nation; Aroland First Nation; Indigenous Communities with Overlapping Interests).	• Construction and operations
• **Community Well-Being**	• Traditional Foods	• Local Study Area (Marten Falls First Nation; Aroland First Nation; Indigenous Communities with Overlapping Interests).	• Construction and operations
• **Community Well-Being**	• Access to Clean Water	• Local Study Area (Marten Falls First Nation; Aroland First Nation; Indigenous Communities with Overlapping Interests).	• Construction and operations
• **Community Well-Being**	• Public Safety	• Local Study Area (Marten Falls First Nation; Aroland First Nation; Indigenous Communities with Overlapping Interests).	• Construction and operation.
• **Community Well-Being**	• Biophysical Determinants of Health (Air)	• Local Study Area (Marten Falls First Nation; Aroland First Nation; Indigenous Communities with Overlapping Interests).	• Construction and operation.
• **Community Well-Being**	• Biophysical Determinants of Health (surface water, sediment, soil and groundwater)	• Local Study Area (Marten Falls First Nation; Aroland First Nation; Indigenous Communities with Overlapping Interests).	• Construction and operation.
• **Land and Resource Use**	• Trapping	• 100-metre-wide Community Access Road right-of-way, temporary construction access roads, work areas, worker camps, and pits, quarries, and associated access roads.	• Construction • Operation
• **Visual**	• Cultural Heritage Resources and Indigenous Experience and Sense of Place	• Within 8 kilometres (total of 16 kilometres) of the centerline of the route alternatives.	• Construction • Operation
• **Visual**	• Recreation and Tourism	• Within 8 kilometres (total of 16 kilometres) of the centerline of the route alternatives.	• Construction • Operation
• **Visual**	• Parks and Protected Areas	• Within 8 kilometres (total of 16 kilometres) of the centerline of the route alternatives.	• Construction • Operation
• **Visual**	• Permanent Settlements	• Within 8 kilometres (total of 16 kilometres) of the centerline of the route alternatives.	• Construction • Operation

Table 10.4-2: Project and Physical Activities Carried Forward for Land Disciplines

Discipline(s)	Project	Project Description	Project / Activity Reasonably Foreseeable (Y/ N)	Valued Components Temporal Overlap with Project (Y / N)	Valued Components Spatial Overlap with Project (Y / N)
• **Aboriginal and Treaty Rights and Interests** • **Acoustic and Vibration** • **Atmospheric** • **Land and Resource Use** • **Community Well-Being** • **Visual**	• Northern Road Link	• Marten Falls First Nation and Webequie First Nation are proposing to build, operate and maintain an all-season multi-use road and associated infrastructure between the Community Access Road that has been proposed by Marten Falls First Nation and the supply road that has been proposed by Webequie First Nation. • Terms of Reference for the preparation of an Environmental Assessment were approved March 3, 2023.	• Yes	• Yes	• Local Study Area - Yes • Regional Study Area - Yes
• **Aboriginal and Treaty Rights and Interests** • **Acoustic and Vibration** • **Atmospheric** • **Land and Resource Use** • **Community Well-Being** • **Visual**	• Anaconda and Painter Lake Forestry Access Road Upgrades	• Upgrades to existing road will be required for heavy vehicles accessing the Community Access Road route during construction and operations. • Currently discussions on proponency and scope of work are underway. • Potential scope of work is expected to include roadway widening, culvert and bridge replacements / rehabilitations to accommodate higher weight vehicles, and road base improvements. • This project will be completed prior to the start of the construction of the Community Access Road and therefore the upgrade to these roads is not expected to overlap with the construction of the Community Access Road.	• Yes	• Yes	• Local Study Area - Yes • Regional Study Area - Yes
• **Aboriginal and Treaty Rights and Interests** • **Atmospheric** • **Land and Resource Use**	• Ogoki Forest Management Plans	• Forest Management Plans for the Ogoki Forest. • Includes Ogoki-Armstrong Primary Roads as these roads are being used for forest management. • Includes plans for future harvest. • Ogoki Forest is approximately 10,900 square kilometres in size and includes approximately 9,798 square kilometres of forested area. • Majority of the forest is traditional territory and is subject to forest management planning and forest management operations.	• Yes	• Yes	• Local Study Area - Yes • Regional Study Area - Yes
• **Aboriginal and Treaty Rights and Interests** • **Atmospheric** • **Community Well-Being** • **Visual**	• Rapid Lynx Broadband	• Approximately 810 kilometres of fibre-optic cables, providing reliable high-speed internet service to five Matawa First Nation communities: Eabametoong, Marten Falls, Neskantaga, Nibinamik, and Webequie with an interconnection at Aroland.	• Yes	• Yes	• Yes
• **Aboriginal and Treaty Rights and Interests** • **Community Well-Being**	• Esnagami Road Bypass Upgrade	• Upgrades to existing road to use as a bypass route around Aroland First Nation settlement area by heavy vehicles accessing the Community Access Road route towards the Ring of Fire. • Currently discussions on proponency and scope of work are underway. • Potential scope of work is expected to include roadway widening, bridge and culvert rehabilitation / replacement, and road base improvements.	• Yes	• Yes	• Yes
• **Aboriginal and Treaty Rights and Interests** • **Community Well-Being**	• Transload Facility	• Rail transload facility to Aroland First Nation.	• Yes	• Yes	• Yes
• **Aboriginal and Treaty Rights and Interests** • **Community Well-Being**	• Webequie Supply Road	• New Community Access Road approximately 107 kilometres in length from Webequie First Nation to the mineral deposit near McFaulds Lake for mineral exploration and future mining development activities. • 17 kilometres of the corridor is within Webequie First Nation Reserve Lands.	• Yes	• Yes	• Yes
• **Acoustic and Vibration** • **Community Well-Being**	• Winter Access Road Realignment Project	• Funding to remote northern communities for projects involving installation of water crossing infrastructure, such as pre-engineered bridges and culverts, and repairs to existing structures. • Funding for approximately 3,200 kilometres of winter access roads in Northern Ontario.	• Yes	• Yes	• Yes

Discipline(s)	Project	Project Description	Project / Activity Reasonably Foreseeable (Y/ N)	Valued Components Temporal Overlap with Project (Y / N)	Valued Components Spatial Overlap with Project (Y / N)
• **Community Well-Being**	• Equinox Gold Corp.'s Greenstone Gold Mine	• Construction, operation, decommissioning and abandonment of an open-pit gold mine and onsite metal mill located near Geraldton, Ontario. • Production estimated at 30,000 tonnes per day. • Amended Decision Statement issued February 10, 2021. • First gold pour is anticipated in early 2024.	• Yes	• Yes	• Yes
• **Aboriginal and Treaty Rights and Interests**	• Ogoki and Long Lac Diversions	• Divert water from a portion of the Hudson Bay watershed into the Lake Superior basin. • Long Lac diversion inflows approximately 39 cubic metres per second into the Great Lakes Basin. • Ogoki diversion inflows approximately 113 cubic metres per second into the Great Lakes Basin.	• Yes	• Yes	• Yes
• **Aboriginal and Treaty Rights and Interests**	• Gull Bay Roads Rehabilitation	• Rehabilitate approximately 10 kilometres of roads in the Gull Bay First Nation in Ontario. • Relocation of the community's entrance and exit to Highway 527; rebuilding the road base and widening certain sections; grading and brush clearing to improve sightlines; addressing drainage issues through ditching and the replacement of an estimated 43 culverts; installing street and traffic control signs (street, stop, yield, and speed signs plus pedestrian warnings); and resurfacing Main Street and Streets A through M with Granular A along with calcium chloride for dust suppression. • Infrastructure Ontario issued its Notice of Determination on July 15, 2021, and determined that the project is not likely to cause significant adverse environmental effects.	• Yes	• Yes	• Yes
• **Aboriginal and Treaty Rights and Interests**	• Wataynikaneyap • Powerline	• Construction of a 230 kilovolts line between Ignace and Dryden, to Pickle Lake (Phase 1). • Construction of electricity transmission lines to Pickle Lake and north of Red Lake, connecting 17 remote northern Ontario communities to grid power (Phase 2). • Operation of both project phases overlap with the construction and operations of the Community Access Road.	• Yes	• Yes	• Yes
• **Aboriginal and Treaty Rights and Interests**	• Kasabonika Lake First Nation Band Representative Facility	• The Kasabonika Lake First Nation Band Representative Facility project involves the construction of a new single-story Child and Family Service building and housing facilities for staff in the community of Kasabonika Lake. • Includes tree clearing, lot development, parking lot and laneway construction, connection to community's water and wastewater infrastructure and building construction.	• Yes	• Yes	• Yes
• **Aboriginal and Treaty Rights and Interests**	• Kashechewan First Nation - 20 Lot Development	• Development of 20 lots with future use to build family homes for the community. Each lot is roughly 929 metres in size. • The project will include site preparation activities including clearing, grubbing, granular placement, and servicing of lots with municipal utilities and services. • The Notice of Determination was issued on November 17, 2023, and determined that the project is not likely to cause significant adverse environmental effects.	• Yes	• Yes	• Yes
• **Aboriginal and Treaty Rights and Interests**	• Attawapiskat First Nation - Airport Heights Residential Subdivision	• Lot servicing project, for a maximum of 28 serviced residential lots in the proposed Airport Heights Residential Subdivision.	• Yes	• Yes	• Yes
• **Aboriginal and Treaty Rights and Interests**	• Neskantaga First Nation Community Recreation Centre	• Renovation of the existing community recreation centre and arena, to include an additional 2,400 square feet in size and will include washrooms.	• Yes	• Yes	• Yes
• **Aboriginal and Treaty Rights and Interests**	• Rehabilitation of Nibinamik Lagoon Sewage Treatment Lagoon and Collection Systems	• Repair and replacement of components of a sewage lagoon and the purchase of a septic truck in Nibinamik First Nation. • Includes re-excavating and repairing 30 manholes and covers, flushing outflow lines, removing and replacing two pressure relief valves, repairing damaged section of the lagoon, and buying a septic truck.	• Yes	• Yes	• Yes
• **Aboriginal and Treaty Rights and Interests**	• Accelerated High-Speed Internet Program	• Providing access to reliable, high-speed internet to unserved and underserved communities across the province by the end of 2025.	• Yes	• Yes	• Yes

10.4.2 Aboriginal and / or Treaty Right and Interests

As described in **Section 8.3.4**, Indigenous communities have received a detailed report specific to their existing conditions and impacts. The impact assessment included information on potential project interactions in relation to Aboriginal and / or Treaty Rights and Interests. Communities were given the opportunity to review and provide feedback on their draft reports.

The Aboriginal and / or Treaty Rights and Interests cumulative impacts assessment carries forward indicators identified in the residual impacts and discusses potential cumulative impacts on each Indigenous community's Aboriginal and / or Treaty rights and interests, identifies mitigation measures, and characterizes the predicted adverse residual cumulative impacts.

The following describes the cumulative impact assessment for the Preferred Route across both temporal phases of the Community Access Road. It does not include the results of the cumulative impact assessment, which will be shared with each Indigenous community in their community-specific Aboriginal and / or Treaty Rights and Interests: Impact Assessment reports.

To support a comprehensive regulatory review, these community-specific reports will be shared with the Regulator. They form part of the evidence base for determining the assessment outcome.

Due to confidentiality and / or the sensitive nature of the information, detailed community reports are not being shared publicly.

10.4.2.1 Indigenous Current Use of Lands and Resources for Traditional Purposes

In each community-specific Aboriginal and / or Treaty Rights and Interests Impact Assessment Report, a summary of the residual impacts carried forward to the cumulative impact assessment is provided (loss of or physical change to sites and areas used for traditional purposes).

For each identified residual impact carried forward the following assessment sections were completed:

- A description of the potential cumulative effect on rights. For example, three projects identified in the Project Inclusions List overlap with a trapline, and one project overlaps with a trapline within the Regional Study Area.

- A description of the potential cumulative impacts on rights. For example, there are four other developments that could directly impact trapline areas of significance to the First Nation and will result in an incremental loss of the current area available for trapping and other rights-based activities.
- A summary of mitigation measures proposed. For example, notify Indigenous communities and trapline holders of Community Access Road activities, schedules, and locations.
- An assessment of predicted cumulative impacts on rights including context, direction, magnitude, geographic extent, duration, frequency, reversibility, and likelihood.
- An assessment of the severity of the cumulative impacts and associated prediction confidence.

10.4.2.2 Cultural Continuity and Well-being

In each community-specific Aboriginal and / or Treaty Rights and Interests Impact Assessment Report, a summary of the residual impacts carried forward to the cumulative impact assessment is provided (for example, changes in the experience of being on the land).

For each identified residual impact carried forward the following assessment sections were completed:

- A description of the potential cumulative effect on rights. For example, the Community Access Road has the potential to affect the experience of being on the land, in terms of freedom from disturbance, due to changes in the noise environment.
- A description of the potential cumulative impacts on rights. For example, where the Community Access Road and other projects / activities overlap with the First Nation's Area of Interest, the potential effects on the noise environment may be even more pronounced, particularly during concurrent construction activities when adverse effects on this valued component are expected to be greatest. Changes to the noise environment may alter the experience of being on the land.
- A summary of mitigation measures proposed. For example, provide Indigenous communities with advance notices and regular updates regarding location and timing of construction activities, including bridge construction and blasting operations.

- An assessment of predicted residual cumulative impacts on rights including context, project phase(s), direction, magnitude, geographic extent, duration, frequency, reversibility, and likelihood.
- An assessment of the severity of the residual impacts and associated prediction confidence.

10.4.3 Acoustic and Vibration

Two valued components with residual effects were carried forward to the acoustic and vibration Cumulative Effects Assessment:

- Noise; and
- Vibration.

The locations of the projects considered for the Cumulative Effects Assessment in relation to the noise and vibration Regional Study Area are shown on **Figure 10.4-1**.

10.4.3.1 Noise

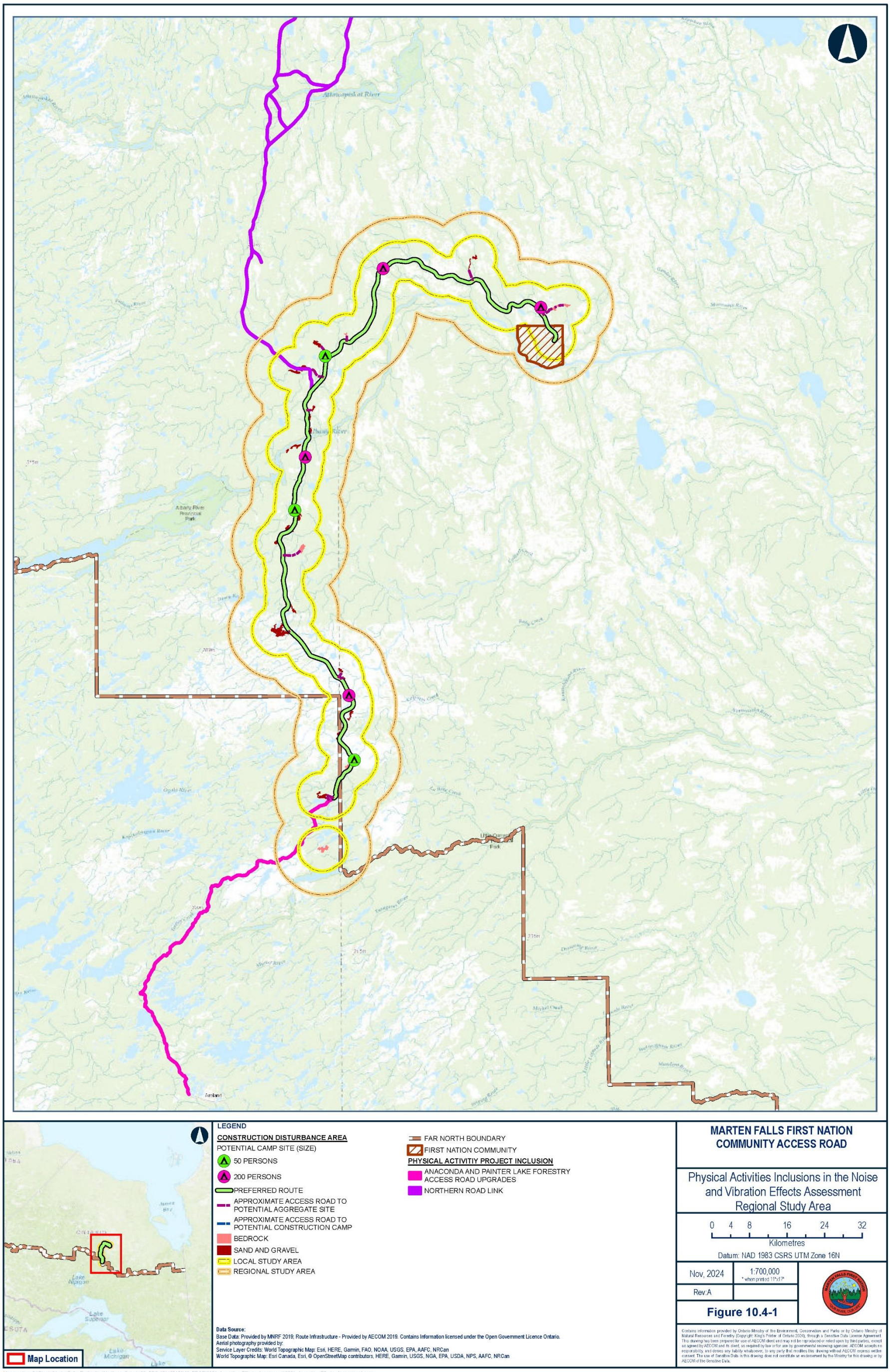
The construction and operation of the Northern Road Link, operations of the Anaconda and Painter Lake Forestry Access Road upgrades, and construction and operations of the Community Access Road have the potential for cumulative effects on noise through the use of heavy mobile equipment and road traffic. This is because it is predicted that, after the implementation of impact management measures, exceedances of applicable criteria at potential points of reception may occur.

The magnitude of the cumulative effects from the increased noise during construction and operations, for example, quarry blasting, has the potential to range from low to high, depending on the distance between the points of reception and the construction activities. Therefore, for a conservative assessment, the cumulative effects were assessed to be **high**.

10.4.3.2 Vibration

The construction and operations of the Northern Road Link, operations of the Anaconda and Painter Lake Forestry Access Road upgrades, and construction and operations of the Community Access Road have the potential for cumulative effects on vibration through the use of heavy mobile equipment and blasting. This is because it is predicted that, after the implementation of impact management measures, exceedances of applicable criteria at potential points of reception may occur.

Figure 10.4-1: Physical Activities Inclusions in the Noise and Vibration Effects Assessment Regional Study Area



The magnitude of the cumulative effects from the increased vibration during construction and operations, for example, quarry blasting, has the potential to range from low to high, depending on the distance between the points of reception and the construction activities. Therefore, for a conservative assessment, the cumulative effects were assessed to be **high**.

10.4.3.3 Mitigation Measures

It is anticipated that mitigation measures will be, or have been, implemented to limit noise and vibration levels during the construction and operations of the Northern Road Link and Anaconda and Painter Lake Forestry Access Road upgrades, and that these mitigation measures will be similar to those implemented for the Community Access Road. Refer to **Section 9.5.3** for a complete description of the proposed mitigation measures for Acoustic Environment.

10.4.3.4 Determination of Significance

Significance was determined only for disciplines where it was required to meet federal or provincial requirements. For the purposes of this Cumulative Effects Assessment, significance of the effects for acoustic and vibration was not determined.

10.4.4 Cultural Heritage

No residual effects on cultural heritage valued components were carried forward from the residual effects assessment; therefore, no cumulative effects on built heritage resources and cultural heritage landscapes are anticipated.

10.4.5 Archaeology

No residual effects to archaeology valued components were carried forward from the residual effects assessment; therefore, no cumulative effects on archaeological resources are anticipated.

10.4.6 Atmospheric Environment

10.4.6.1 Air Quality

The only valued components with residual effects carried forward into the Cumulative Effects Assessment for the air quality discipline is changes to air quality.

Detailed operational information, including equipment, operating schedules, and location of activities, are required to estimate emissions from the project activities listed

in the Project Inclusions List. As operational information is not available, a quantitative Cumulative Effects Assessment cannot be completed at this time. Interactions may occur at the north and south ends of the road where the Community Access Road connects with the Northern Road Link and Anaconda and Painter Lake Forestry Access Road upgrades; however, interactions would likely be limited to areas with overlapping spatial and temporal boundaries (in other words, directly adjacent to connection points) and would not extend along the full road corridor.

It is anticipated that each of the projects on the Cumulative Effects Assessment Project Inclusions List contains elements of construction and / or operations that would share the potential for emissions of like contaminants (such as particulates and products of combustion) with the Community Access Road. It should be noted that traffic projections included within this Cumulative Effects Assessment include a forecasted prediction of combined traffic levels from the Northern Road Link and Anaconda and Painter Lake Forestry Access Road upgrades.

Projects in the region with potential overlapping spatial and temporal boundaries with the Community Access Road may have the potential to result to increase the magnitude, frequency, irreversibility, and likelihood of the Community Access Road's residual effects. Significance of effects is unlikely to change from those documented within this Cumulative Effects Assessments.

10.4.6.2 Greenhouse Gas

No residual effects to the greenhouse gas valued components were carried forward from the residual effects assessment; therefore, no cumulative effects as a result of greenhouse gases are anticipated. The Atmospheric Environment Technical Support Document can be found in **Appendix S**. A summary will be provided in the Final Environmental Assessment / Impact Statement.

10.4.7 Community Well-Being

Seven valued components with residual effects were carried forward to the community well-being Cumulative Effects Assessment:

- Community access to infrastructure and services;
- Cultural preservation and change;
- Community and public health;
- Access to clean water;
- Traditional foods;

- Public safety; and
- Biophysical determinants of human health (air).

The locations of the projects considered for the Cumulative Effects Assessment in relation to the community well-being Regional Study Area are shown on **Figure 10.4-2**.

10.4.7.1 Community Access to Infrastructure and Services

The construction and operation of multiple road projects, including the Community Access Road and Northern Road Link, and others, will place increased strain on local transportation networks in the Local Study Area. Construction is expected to increase reliance on winter access roads and air transportation for the mobilization of equipment, supplies, and work force transportation. This increase in use of existing transportation networks may result in potentially negative effects of traffic congestion or scheduling challenges for community members. There may be negative effects related to safety along existing routes, especially for winter access roads, when heavy equipment or large shipments of materials may be brought into community.

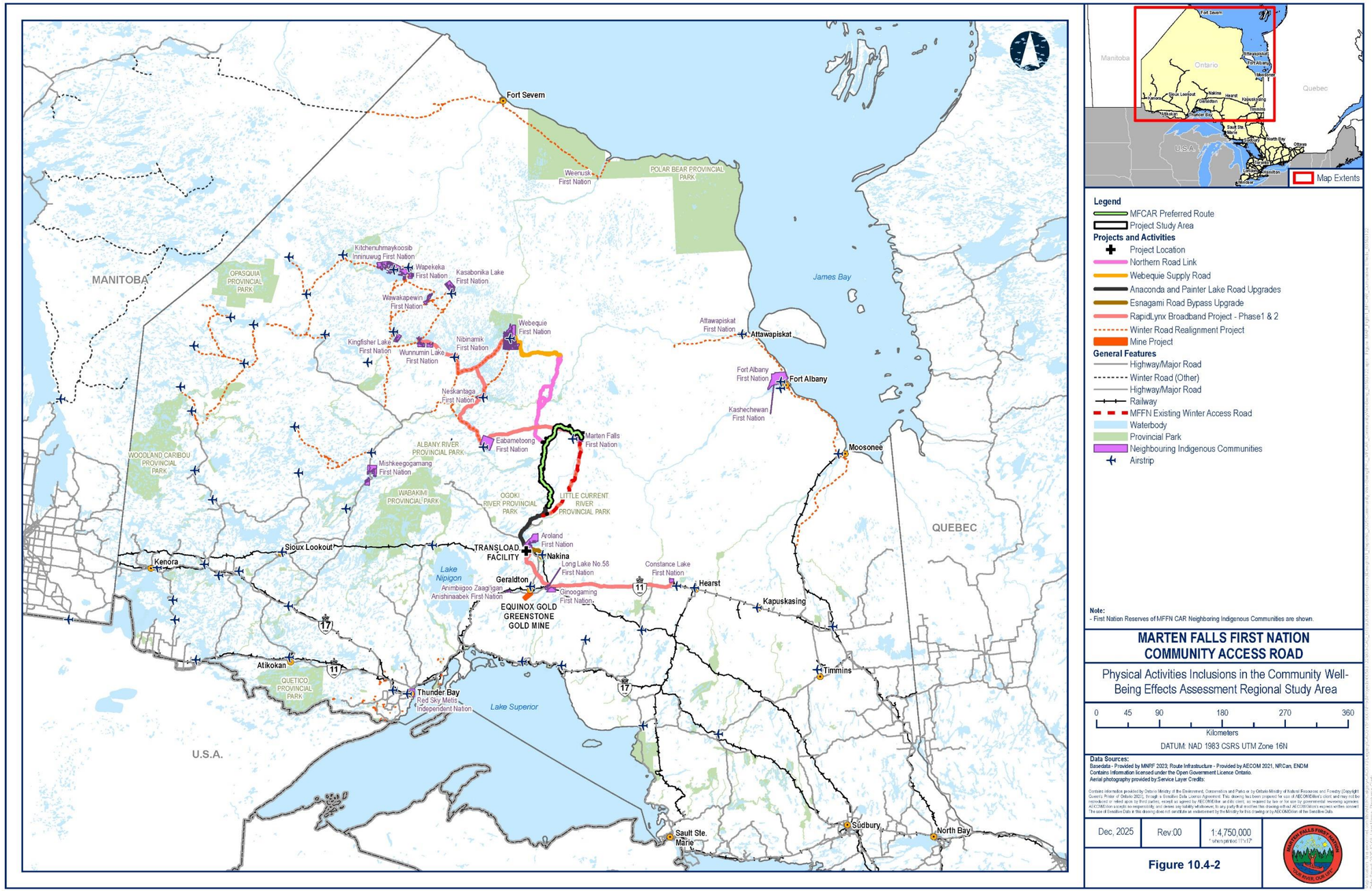
It is expected that the negative impacts related to community access will be reduced, but the residual risk will remain elevated due to the sheer volume of traffic associated with multiple projects in the region.

10.4.7.2 Cultural Preservation and Change

The construction of multiple projects, including the Community Access Road, Transload Facility in Aroland, Northern Road Link, and others, could contribute to a disruption to the traditional economy and cultural practices in the Local Study Area due to potential loss of traditional harvesting areas / disturbance in the local construction area. This could also reduce available land for traditional activities within the project footprint. These changes may temporarily alter animal migration paths, disturb vegetation, and could lead to overharvesting of traditional resources in the Local Study Area.

These impacts may be compounded by other projects in the area, including the Northern Road Link, Anaconda and Painter Lake Forestry Access Road upgrades, and others.

Figure 10.4-2: Physical Activities Inclusions in the Community Well-Being Effects Assessment Regional Study Area



10.4.7.3 Community and Public Health

Construction and operation of multiple projects will create overlapping pressures on mental health and well-being. During construction, workers may experience stress and burnout, while community members may face sensory disturbances, restricted land access, and cultural loss. These effects may compound with other projects, amplifying psychosocial challenges, particularly for Indigenous women and youth.

Operations may continue to influence mental health for some individuals, particularly through a diminished sense of connectivity to land and cultural identity. These effects are expected to remain localized to areas where the road corridor exists and may persist as long as the infrastructure remains, though they could be reversible through access to mental health supports and land-based activities.

10.4.7.4 Access to Clean Water

There are possible negative residual cumulative effects on water quality related to access to clean water. Construction and operations and maintenance activities can create air emissions and dust which affects air quality and has the potential to settle on surface water and soils. Additionally accidents and malfunctions could impact air, sediment, soils, surface water and groundwater directly.

10.4.7.5 Traditional Foods

The construction and operation of multiple projects, including the Community Access Road, Northern Road Link, Transload Facility in Aroland, and others, will create overlapping pressures on traditional foods in the Local Study Area. Construction activities, including land clearing for the road corridor, work camps, and pits and quarries, may lead to disturbances that reduce the availability of traditional foods during key harvest seasons. During operations, possible negative residual effects on availability traditional foods include a local decrease in availability of `traditional food resources, due to disruption from the road itself or the result of increased harvesting due to increased access. There may also be a possible negative effect on the quality of traditional foods, due to contamination from construction activities.

10.4.7.6 Public Safety

The construction and operations of the Community Access Road, along with other regional infrastructure projects, will contribute to cumulative public safety concerns, particularly related to road use accidents, emergency service access, and social risks.

During construction, heavy traffic on winter and access roads may raise the risk of accidents despite traffic management plans. Once operational, the shift from a seasonally available winter access road to a year-round route is expected to lead to more accidents due to higher traffic volumes.

The construction and operations of multiple road projects will place increased strain on local healthcare and emergency services. During the construction, increased traffic accidents and injuries could overwhelm local medical providers.

The combined effects of multiple construction and operational activities could contribute to an increase in violence and criminal activity, particularly human trafficking, along these roads. The construction may contribute to these issues due to an influx of workers, long-term family separations, and increased stress, which can elevate the risk of domestic violence. Improved road accessibility may facilitate human trafficking, particularly affecting Indigenous women, girls, boys, and gender-diverse individuals.

10.4.7.7 Biophysical Factors Influencing Human Health

The predominant residual effect is particulate concentrations in air during operations. This would be additive in areas of spatial and temporal overlap. Temporal overlap is anticipated as operations are considered continuous. Refer to **Section 10.4.3** for further details on cumulative effects to the atmospheric environment.

10.4.7.8 Mitigation Measures

To mitigate negative effects on drinking and recreational water:

- Owner / operator to establish working groups with Marten Falls First Nation, Aroland First Nation, and other interested Indigenous communities from the Regional Study Area, including Constance Lake, Neskantaga, Animbiigoo Zaagi'igan Anishinaabek, Attawapiskat, Kashechewan, and Fort Albany First Nations, to meet regularly to discuss community-proposed topics in relation to the construction of the Community Access Road, including concerns related to contamination of ground and surface water.
- Surface water and groundwater will not be used as a drinking water source without appropriate treatment.
- Best practices for construction and operations will be used to minimize dust formation and to reduce the risks of accidents or malfunctions.

To address potential effects related to public safety, a mitigation measure has been identified that the owner / operator will establish a working group with Marten Falls First

Nation, Aroland First Nation, and the owner / operator to meet regularly and discuss issues such as driver's license accessibility, road safety training, and risks of increased violence.

No additional mitigation or enhancement measures are proposed as part of the community well-being Cumulative Effects Assessment. Refer to **Section 9.5.6** for a complete description of the proposed mitigation measures for community well-being.

10.4.7.9 Determination of Significance

Significance was determined only for disciplines where it was required to meet federal or provincial requirements. For the purposes of this Cumulative Effects Assessment, significance of the effects for community well-being was not determined.

10.4.8 Land and Resource Use

The only valued components with residual effects carried forward into the Cumulative Effects Assessment for the Land and Resource Use Discipline is trapping.

The locations of the projects considered for the Cumulative Effects Assessment in relation to the Land and Resource Use Regional Study Area are shown on **Figure 10.4-3**.

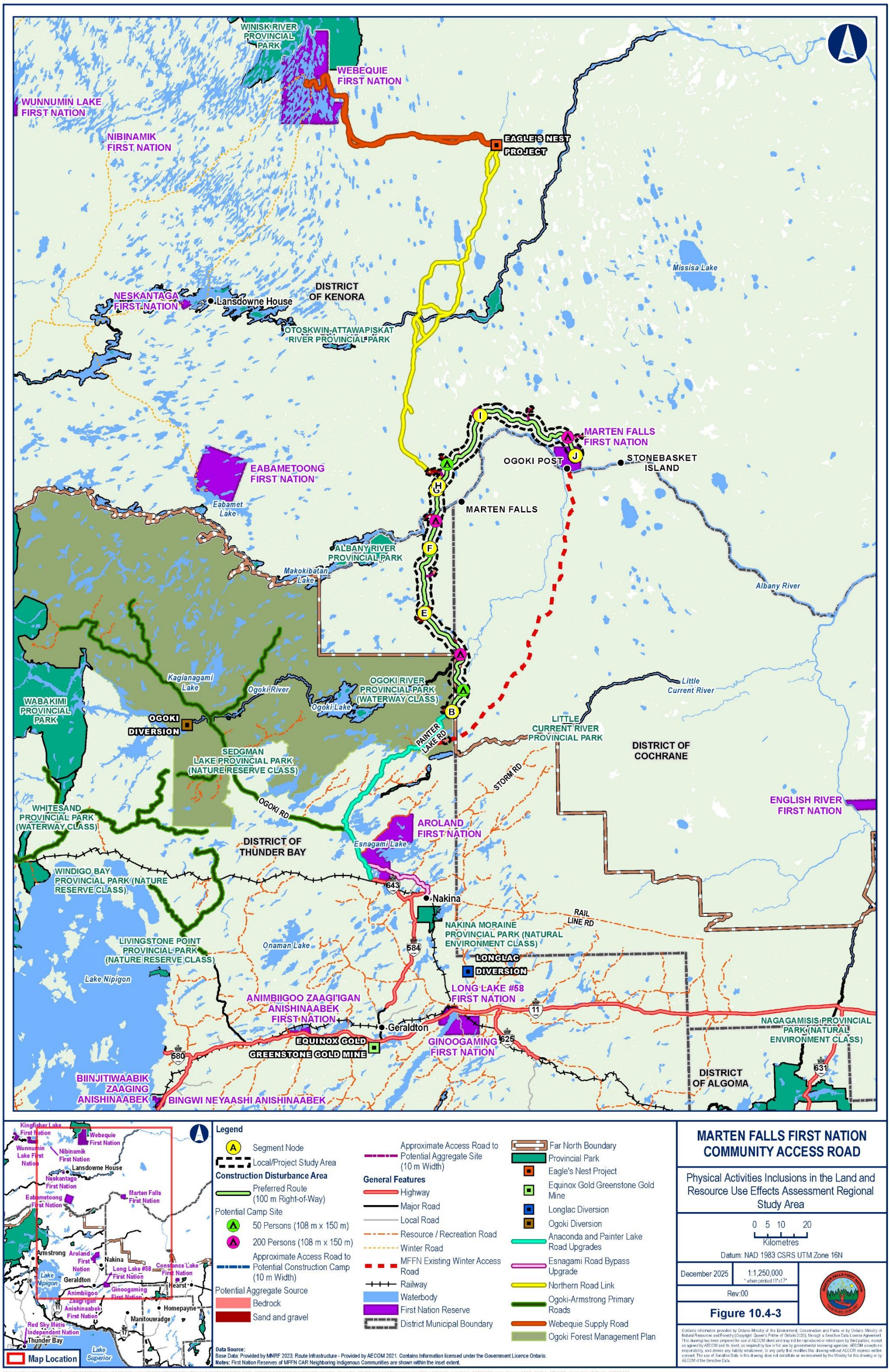
10.4.8.1 Trapping

There is potential for cumulative effects on trapping within three trapline areas (GE148, GE153, and GE154) due to the combined presence of the Community Access Road and the Northern Road Link. These effects are primarily related to habitat loss for furbearing species and disturbances during construction and operations of the projects, specifically these projects could increase the area of land that is temporarily or permanently less suitable for trapping in proximity to the road corridors.

Conversely, the Northern Road Link would also improve access to trapline areas, which may provide a benefit to trapping activities by reducing travel time and effort.

As no feedback was received from registered trapline holders or helpers, the extent to which increased access or disturbance may influence trapping activities remains uncertain.

Figure 10.4-3: Physical Activities Inclusions in the Land and Resource Use Effects Assessment Regional Study Area



10.4.8.2 Mitigation Measures

The following mitigation measures are proposed to manage potential cumulative effects to land and resource use:

- Communicate with trapline holder in advance of and during construction through multiple efforts such as letters, signage around the future Construction Disturbance Area.
- Permit travel through the project corridor by the trapper during construction.
- Same mitigation measures previously outlined for the trapping valued component (**Section 9.5.7.3.7**).

10.4.8.3 Determination of Significance

The combined area of habitat removal and disturbance associated with both projects represents a small proportion of the overall trapline areas. Considering the limited spatial overlap, the localized nature of effects, and the uncertainty regarding actual trapping activity levels, cumulative effects on trapping are assessed as low to moderate in magnitude and **not significant.**

10.4.9 Visual

Four valued components with residual effects were carried forward to the visual environment Cumulative Effects Assessment.

- Changes to cultural heritage resources and indigenous experience and sense of place visual environment;
- Changes to recreation and tourism visual environment;
- Changes to parks and protected areas visual environment; and,
- Changes to permanent settlements visual environment.

10.4.9.1 Cultural Heritage Resources and Indigenous Experience and Sense of Place Visual Environment

It is expected that there will be localized, short-term visual change at the Albany River and Ogoki River crossings, and other major crossings during construction; however, these changes are not anticipated to be significant during operations.

Cumulative visual magnitude is low to moderate where projects spatially overlap; these overlap areas generally do not coincide with major river crossings and are typically in

forested settings. With feathered clearing edges, natural regeneration of temporary disturbance areas, and lighting restrictions, cumulative visual effects remain localized and limited in duration. The resulting cumulative effect is **not significant** overall for this valued component.

10.4.9.2 Recreation and Tourism Visual Environment

It is expected that there will be localized and temporary visual changes during active construction at major river crossings, with effects confined to crossing viewsheds and experienced intermittently by users; however, these changes are not anticipated to be significant for broader recreation and tourism setting during construction and operations.

Where construction activities or bridge structures from multiple projects may be visible concurrently, visual disturbance may be temporarily intensified within localized portions of travel corridors. However, cumulative magnitude remains low to moderate, spatially confined, and short-term in nature. At the recreation-use scale, cumulative visual effects are **not significant.**

10.4.9.3 Parks and Protected Areas Visual Environment

It is expected that there will be temporary, localized visual change within crossing view cones during construction, confined to the visual Construction Disturbance Area. At the park scale, residual effects on the visual character of Ogoki River Provincial Park and Albany River Provincial Park are not significant during both construction and operations.

Where other projects or activities overlap spatially with the Community Access Road, these overlaps occur outside parks and protected areas. Within park boundaries, cumulative visual magnitude remains low, and cumulative visual effects on protected landscape character are **not significant**.

10.4.9.4 Permanent Settlements Visual Environment

Residual visual effects are not significant for the Community during both construction and operations. For the two Albany River shoreline cabins, visual change may be noticeable during nearby construction activity but is short-term, reversible, spatially limited, and **not significant** overall.

There are no other past, present, or reasonably foreseeable projects or activities expected to interact visually with the Community Access Road in the vicinity of the Community or the two Albany River shoreline cabins. As such, no cumulative visual effects are anticipated for permanent settlements.

10.4.9.5 Mitigation Measures

The following mitigation measures are proposed to manage potential cumulative effects to the visual environment:

- Align and co-locate laydown and access areas to minimize spatial duplication wherever possible;
- Apply shared colour, texture, and lighting standards across projects to maintain a unified appearance and reduce perceived clutter (especially for crossing structures along the Northern Road Link and Anaconda and Painter Lake Forestry Access Road);
- Allow for regrowth of temporary use areas to hasten the return of natural texture;
- Use full task-specific lighting and dark-sky practices jointly across overlapping projects where possible; and
- Conduct follow-up photo-monitoring where there is physical overlap with the Community Access Road, with adaptive planting or screening if visual contrast remains above prediction after Year 3 or if complaints are received from the community.

10.4.9.6 Determination of Significance

The cumulative effects of the Community Access Road in combination with the other activities / projects are assessed as **not significant** with a moderate to high level of confidence for the visual environment. This determination is based on the following considerations:

- The spatial overlap of visible Project components with other physical activities is limited and occurs primarily at a regional scale rather than within shared local viewsheds;
- Where cumulative visibility may occur, effects are largely confined to linear corridors and isolated river crossing locations;
- The magnitude of residual visual effects from the Community Access Road is low, with medium magnitude effects limited to very close-range viewpoints;
- Similar mitigation measures are applied across projects, reducing the likelihood of compounding visual contrast or widespread alteration of landscape character; and
- The overall scenic integrity, wilderness character, and sense of remoteness that define the regional visual environment are maintained.

Although the visual environment is characterized by high sensitivity, the limited extent, low magnitude, and localized nature of overlapping effects prevent cumulative visual effects from resulting in a meaningful or sustained change to landscape character, Indigenous experience and sense of place, recreation and tourism values, protected area aesthetics, or visual conditions experienced by permanent residents.

10.4.10 Summary of Cumulative Effects

Table 10.4-3 summarizes the cumulative effects for the people disciplines.

Table 10.4-3: Summary of Predicted Cumulative Effects for People Disciplines

Discipline	Valued Component	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Probability of Occurrence	Significance (Significant, Not Significant)	Uncertainty
Aboriginal and Treaty Rights and Interests	Aboriginal and Treaty Rights and Interests	Indigenous Current Use of Lands and Resources for Traditional Purposes	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Aboriginal and Treaty Rights and Interests	Aboriginal and Treaty Rights and Interests	Cultural Continuity and Well-being	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Acoustic and Vibration	Noise	Increase in noise level during construction	Negative	High	Local	Short-term	Infrequent	Reversible	Certain	Not Applicable	Moderate
Acoustic and Vibration	Noise	Increase in noise level during operation (road / quarry)	Negative	Low / High	Local	Long-term	Frequent / Infrequent	Reversible	Certain	Not Applicable	Moderate
Acoustic and Vibration	Vibration	Increase in vibration level during construction	Negative	High	Local	Short-term	Infrequent	Reversible	Certain	Not Applicable	Moderate
Acoustic and Vibration	Vibration	Increase in vibration level during operation	Negative	High	Local	Short-term	Infrequent	Reversible	Certain	Not Applicable	Moderate
Cultural Heritage	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Archaeology	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Air Quality	Changes to Air Quality during Construction	Changes to Air Quality during Construction	Negative	Negligible to High, dependent on contaminant	Varies, dependent on contaminant	Short-term	Continuous to Infrequent, dependent on contaminant	Reversible	Possible to Probable, dependent on contaminant	Not significant	Low
Air Quality	Changes to Air Quality during Operations	Changes to Air Quality during Operations	Negative	Negligible to High, dependent on contaminant	Varies, dependent on contaminant	Long-term	Continuous	Irreversible	Possible to Probable, dependent on contaminant	Not significant	Low
Greenhouse Gas	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Community Well-Being	Community Access to Infrastructure and Services	Access to and from community	Negative	Moderate	Local	Medium-term	Frequent	Reversible	Probable	Not Applicable	Not Applicable
Community Well-Being	Cultural Preservation and Change	Impacts to traditional economy	Negative	Moderate	Local	Short-term	Infrequent	Reversible	Probably	Not Applicable	High
Community Well-Being	Community and Public Health	Mental Health and Well-being	Negative	Moderate	Local	Long-term	Continuous	Reversible	Possible	Not Applicable	High
Community Well-Being	Access to Clean Water	Quality of Water	Negative	Moderate	Local	Long-term	Frequent	Irreversible	Probable	Not Applicable	High
Community Well-Being	Traditional Foods	Quality of Traditional Foods	Negative	Moderate	Local	Short-term	Infrequent	Irreversible	Probable	Not Applicable	High

Discipline	Valued Component	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Probability of Occurrence	Significance (Significant, Not Significant)	Uncertainty
Community Well-Being	Public Safety	Road Related Injuries and Safety Standards	Negative	Moderate	Local	Long-term	Infrequent	Reversible	Probable	Not Applicable	High
Community Well-Being	Public Safety	Access to Emergency Services	Negative	Low	Local	Short-term	Infrequent	Reversible	Possible	Not Applicable	High
Community Well-Being	Public Safety	Violence and Harassment	Negative	Moderate	Local	Long-term	Infrequent	Irreversible	Possible	Not Applicable	High
Community Well-Being	Biophysical Factors Influencing Human Health	Biophysical Factors Influencing Human Health	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Land and Resource Use	Trapping	Potential Effects on Trapping Tenures	Not Applicable	Low / Moderate	Local	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Significant	Not Applicable
Visual	Cultural Heritage Resources and Indigenous Experience and Sense of Place	Changes to views with Cultural Heritage Resource Value, or those that contribute to Indigenous Experience and Sense of Place	Negative	Low	Local	Long-term	Infrequent for land users and community receptors; continuous at the landscape scale during active construction and operations.	Partially reversible through vegetation regrowth and reclamation; permanent for bridge and road forms.	Certain	Not Significant	Low / Moderate
Visual	Recreation and Tourism	Changes to views from areas that provide recreation and tourism value	Negative	Low	Local	Long-term	Infrequent for land users and community receptors; continuous at the landscape scale during active construction and operations.	Partially reversible through vegetation regrowth and reclamation; permanent for bridge and road forms.	Certain	Not Significant	Low / Moderate
Visual	Parks and Protected Areas	Changes to park landscape character and park viewscapes	Not applicable	Low	Local	Long-term	Infrequent for land users and community receptors; continuous at the landscape scale during active construction and operations.	Partially reversible through vegetation regrowth and reclamation; permanent for bridge and road forms.	Certain	Not Significant	Low / Moderate
Visual	Permanent Settlements	Changes to views from permanent settlement	Negative	Low	Local	Long-term	Infrequent for land users and community receptors; continuous at the landscape scale during active construction and operations.	Partially reversible through vegetation regrowth and reclamation; permanent for bridge and road forms.	Certain	Not Significant	Low / Moderate

11. We Listened

11.1 Introduction

This section provides a summary of consultation and engagement activities led by Marten Falls First Nation to inform the Final Environmental Assessment / Impact Statement. The reporting period began with the release of the Notice of Commencement of Environmental Assessment on October 29, 2021, (Marten Falls First Nation, 2021), and extends to September 5, 2025. Additional activities up to the submission of the Final Environmental Assessment / Impact Statement are also captured.

Consultation and engagement activities conducted during the Environmental Assessment / Impact Assessment (Assessment Process) followed the structure outlined in the Consultation and Engagement Plan (Terms of Reference AECOM, 2020c). Consultation and engagement were organized around the four key milestones of the Assessment Process:

- Milestone 1: Notice of Commencement of Environmental Assessment;
- Milestone 2: Effects Assessment Methods;
- Milestone 3: Identification of Preferred Alternatives; and
- Milestone 4: Review of the Draft Environmental Assessment / Impact Statement.

Consultation and engagement associated with Milestone 5: Review of Final Environmental Assessment / Impact Statement will be led by the federal and provincial government agencies, as shown in **Figure 11-1**, with support from the Proponent up to the regulators' decision.

Figure 11-1: Milestones and Consultation and Engagement Reporting

In addition to milestone-based consultation and engagement activities, Marten Falls First Nation conducted consultation related to supplemental project deliverables and technical materials throughout the Assessment Process. This included the release of Milestone Progress Reports (Progress Report 1 in December 2022, Progress Report 2 in November 2023, Progress Report 3 in November 2024, and Progress Report 4 in January 2026), as well as technical documents such as the Stage 1 and Stage 2 Archaeological Assessment Reports (February 2023), the Draft Preliminary Aboriginal and / or Treaty Rights and Interests Existing Conditions Report (November 2023), Stage 1 Archaeological Assessment Report (June 2024), and the voluntary Draft Environmental Assessment / Impact Statement (April 2025). In 2025, the Project Team also released the Draft Community Well-Being Report (April 2025) and the Indigenous community-specific Aboriginal and / or Treaty Rights and Interests: Draft Impact Assessment Reports (July 2025).

Throughout the Assessment Process, consultation and engagement evolved significantly. Early outreach took place under pandemic-related constraints, during which some communities did not respond or expressed concerns or opposition. Over time, however, sustained engagement supported the establishment of clearer communication pathways, increased participation, and more community-specific dialogue. This included strengthening relationships with neighbouring Indigenous communities through frequent communications, targeted engagement activities, and continued availability for meetings and discussions.

Relationship-building was supported by Council-to-Council meetings, including between Marten Falls First Nation and communities such as Eabametoong First Nation and / or Aroland First Nation, where relationship protocols, consultation approaches, and project updates were discussed. Engagement with Aroland First Nation included multiple community meetings, detailed technical discussions during Milestones 3 and 4, and the

creation of a joint task force in 2024. Engagement with Eabametoong First Nation increased through renewed communications, interest in capacity funding, and participation in review of the Draft Environmental Assessment / Impact Statement.

Provincially-supported forums have been another successful approach to consultation and engagement. These offer a space for Indigenous communities, including Elders, to gather over several days to learn about the Community Access Road and the other two road projects in the area, the Northern Road Link and the Webequie Supply Road. The first two forums focused on Aboriginal and / or Treaty Rights and Interests and the third and fourth forums focused on key topics of interest (as identified by neighbouring Indigenous communities) including peatlands, wildlife, cumulative effects, Aboriginal and / or Treaty Rights and Interests, and impacts on caribou and moose. Information was conveyed and / or discussed through topic-centred booths, presentations, and individual breakout rooms with Indigenous communities to discuss topics of most interest to them.

Consultation and engagement were further strengthened through targeted capacity funding supports designed to encourage meaningful participation by eligible Indigenous communities. Throughout the Assessment Process, the Project Team offered two key programs: the Indigenous Knowledge Program, which provided funding and formal Sharing Agreements to communities that chose to contribute Indigenous Knowledge and land and resource use information; and the Community Coordinator Program, which later transitioned into the Community Capacity Funding Program in November 2024. Funding was provided to support activities such as document review, participation in meetings and workshops, logistics, internal coordination, and preparation of community-specific input.

Marten Falls First Nation members contributed Indigenous Knowledge, land and resource use information, and feedback on existing conditions and areas of concern. Community members participated in the evaluation of route alternatives, supported the development of preliminary route recommendations, and reviewed the technically Preferred Route. This engagement culminated in a Band Council Resolution supporting the Preferred Route in August 2024, followed by a Band Council Resolution, in February 2026, endorsing the Final Environmental Assessment / Impact Statement.

A comprehensive Record of Consultation and Engagement accompanies this section. It documents all consultation and engagement activities undertaken by Marten Falls First Nation in support of the Assessment Process. This is a key component of the Final Environmental Assessment / Impact Statement, supporting fulfillment of federal and provincial requirements and commitments set out in the Marten Falls-Ontario Memorandum of Understanding on Shared Consultation Responsibilities. The Record of

Consultation and Engagement describes how input from Indigenous communities, interested persons, and government agencies was sought, received, and considered, demonstrating the Project Team's commitment to meaningful consultation and engagement, transparent decision-making, and regulatory compliance. Prepared at key milestones of the Assessment Process and organized by groups, the Record of Consultation and Engagement (**Appendix X**) provides a clear summary of who participated, what was heard, and how feedback contributed to the development of the Community Access Road.

Section 11 – We Listened includes the following**:**

- **Section 11.1**: introduction;
- **Section 11.2**: federal and provincial requirements;
- **Section 11.3**: who we engaged and why – identification of audiences (Marten Falls First Nation, neighbouring Indigenous communities, interested persons, and government agencies);
  - **Section 11.3.3**: participation in the Indigenous Knowledge Program;
  - **Section 11.3.4**: participation in the Community Coordinator Program;
- **Section 11.4**: consultation and engagement milestones, input, and timing;
- **Section 11.5**: description of consultation and engagement activities across all audiences (Milestones 1, 2, 3, and 4);
- **Section 11.6**: consultation and engagement for the Draft Environmental Assessment / Impact Statement;
- **Section 11.7**: description of consultation and engagement that was unique to each audience and a high-level summary of feedback;
  - **Section 11.7.1**: activities snapshot;
  - **Section 11.7.2**: consultation and engagement with Indigenous communities;
  - **Section 11.7.3**: consultation and engagement with interested persons;
  - **Section 11.7.4**: consultation and engagement with government agencies;
- **Section 11.8**: consideration of identity and Gender-Based Analysis Plus;
- **Section 11.9**: consultation and engagement after September 5, 2025, up to February 2026 (submission of the Final Environmental Assessment / Impact Statement);
- **Section 11.10**: ongoing and future consultation and engagement;

- **Section 11.11**: summary of the Record of Consultation and Engagement; and
- **Section 11.12**: issue resolution.

11.2 Federal and Provincial Requirements

There are both federal and provincial requirements that set the framework for the Assessment Process. These are summarized below and were used to inform the Consultation and Engagement Plan developed during the Terms of Reference to guide communications, engagement, and consultation related to the Community Access Road.

11.2.1 Federal Requirements

Federal requirements for consultation and engagement on the Community Access Road are outlined in the following documents:

- Tailored Impact Statement Guidelines (Impact Assessment Agency of Canada, 2020a);
- Public Participation Plan for the Marten Falls Community Access Road Project Impact Assessment (Impact Assessment Agency of Canada, 2020c); and
- Indigenous Engagement and Partnership Plan for the Marten Falls Community Access Road Project (Impact Assessment Agency of Canada, 2021).

In addition, the Tailored Impact Statement Guidelines require Gender-Based Analysis Plus to be applied to impact assessments in Canada. **Section 11.8** provides information on how this has been applied to the Community Access Road.

11.2.2 Provincial Requirements

The Marten Falls-Ontario Memorandum of Understanding on Shared Consultation Responsibilities (AECOM, 2020) was signed in January 2020 between Marten Falls First Nation and the Province of Ontario. The Memorandum outlines shared responsibilities regarding the procedural aspects of Ontario's duty to consult in the context of the provincial Environmental Assessment for the proposed Community Access Road, for potentially impacted and interested Indigenous communities. Roles and responsibilities governed by the Memorandum include consultation planning and notification, delivery of the planned activities, issues resolution and follow-up, and record keeping for consultation and engagement with Indigenous communities.

A Terms of Reference is the first step in the provincial environmental assessment process and is a roadmap for planning and decision-making. It outlines how an environmental assessment should be prepared, including the studies to be conducted, the process for identifying and assessing the effects of a proposed project, and how people should be consulted.

The Terms of Reference for the Community Access Road was prepared in accordance with the provincial *Environmental Assessment Act* (Government of Ontario, 1990a) and the Code of Practice: Preparing and Reviewing Terms of Reference for the Environmental Assessments in Ontario (Ministry of the Environment, Conservation and Parks 2014); it was submitted to the Ontario Ministry of the Environment, Conservation and Parks on October 23, 2020.

The Terms of Reference includes the Consultation and Engagement Plan (AECOM, 2020c), which was used to guide consultation and engagement efforts throughout the Assessment Process. This document serves as a useful reference, particularly the following sections:

- **Section 2.1:** Principles of Consultation (guiding principles of the Marten Falls First Nation Community-Based Land Use Planning Team for Community Access Road consultation and engagement);
- **Section 2.2:** Nishnawbe Aski Nation's Consultation Policy; and
- **Section 2.3:** Duty to Consult (provincial requirements).

The Terms of Reference was approved with amendments on October 8, 2021, and the Notice of Commencement of the provincial Environmental Assessment for the Community Access Road was posted on October 29, 2021.

As part of the Terms of Reference - Notice of Approval, Ontario's Minister of the Environment, Conservation and Parks included an amendment requiring three additional consultation and engagement reports with Indigenous communities (for example, Milestone Progress Reports), at the environmental assessment milestones noted below. This additional reporting was intended to support Indigenous communities in providing meaningful input during the development of the Environmental Assessment for the Community Access Road.

Each progress report was required to:

- Be organized by each Indigenous community;
- Contain a consultation and engagement log and summary that tracks consultation and engagement activities, information shared by the Project Team

with Indigenous communities, and community input and the Project Team's responses to such input for the environmental assessment milestone; and

- Contain a discussion of how input and information provided by the Indigenous communities have informed the development of the environmental assessment milestone.

The progress reports met the requirements noted above and community-specific sections were distributed to each individual Indigenous community for their review and comment. Each progress report was also shared with the Ministry of the Environment, Conservation and Parks.

A fourth progress report was also provided to Indigenous communities. Progress Report 4 was the last of the four consultation and engagement reports that now collectively make up the Record of Consultation and Engagement for Indigenous Communities for the Environmental Assessment / Impact Statement. While a separate Progress Report 4 was not mandated, its inclusion reflects Marten Falls First Nation's commitment to transparency and meaningful consultation and engagement.

Also, when the Terms of Reference was approved by the Minister of the Environment, Conservation and Parks, additional requirements for consultation with Indigenous communities with respect to the cumulative effects assessment were included. The following amendments were required:

Amendment 1.1:

- Consult with Indigenous communities on the cumulative effects assessment work plan, methodology, results, and impact management measures;
- Offer targeted consultation opportunities to each Indigenous community; and
- Consider any consultation activities / tools that Indigenous communities request to facilitate the consultation required.

Amendment 1.4:

- Develop a Cumulative Effects Consultation Report that includes:
  - A summary of the consultation completed with Indigenous communities and any other organizations / agencies regarding the development of the cumulative effects assessment; and
  - A comment-response table(s) showing how comments from Indigenous communities and any other organizations / agencies were considered and incorporated, as appropriate, in the development of the cumulative effects assessment.

The Cumulative Effects Consultation Report is available in **Appendix X**, detailing activities conducted, and input received throughout all phases of the Assessment Process.

Provincial requirements were inclusive of all federal requirements, and both were met during the Assessment Process. Additional requirements outlined in the Marten Falls-Ontario Memorandum of Understanding on Shared Consultation Responsibilities were also met.

11.3 Who We Engaged and Why

This section describes the audiences engaged for the proposed Community Access Road, how they were identified, and the criteria used to tailor the frequency and depth of engagement.

11.3.1 Marten Falls First Nation

Marten Falls First Nation is both the Proponent of the proposed Community Access Road and the community most directly affected by its development. As Proponent participating in a community-led process, Marten Falls First Nation formed a Project Team that acts with guidance, direction, and input from Chief and Council, Senior Community Member Advisors, and membership. This governance structure helped to ensure Marten Falls First Nation priorities and knowledge guided the Community Access Road.

With Marten Falls First Nation as the Proponent, the Assessment Process was guided by the interests, priorities, and well-being of the Community. Their approach to consultation and engagement was also grounded in the Marten Falls-Ontario Memorandum of Understanding on Shared Consultation Responsibilities, which outlines how the Province and Marten Falls First Nation share procedural aspects of Ontario's duty to consult during the provincial environmental assessment process. With their distinct role, additional opportunities were offered to provide input, review documents, and meet ahead of broader distribution to neighbouring[1] Indigenous communities, interested persons, and government agencies. Feedback from Marten Falls First Nation regularly contributed to the development of consultation, engagement, and communication materials, including Public Information Centres, discussion guides, webinars and video content.

1. The term "neighbouring" is used to identify any Indigenous community being consulted and engaged with respect to the Community Access Road; the term is not in reference to proximity. Marten Falls First Nation is regarded as both a neighbouring Indigenous community and as the Proponent.

Marten Falls First Nation's early and continuous involvement provided valuable insights on various aspects of the Community Access Road, including the Assessment Process, the Indigenous Knowledge Program, and the funding mechanisms offered to neighbouring Indigenous communities. Their involvement also led to tangible outcomes, including refinement of the Preferred Route and formal Band Council Resolutions supporting both the Preferred Route and submission of the Final Environmental Assessment / Impact Statement.

Marten Falls First Nation's participation has helped ensure that traditional knowledge and practices are incorporated into the Assessment Process. As the Proponent and key rightsholder, Marten Falls First Nation is most directly impacted by the outcome of the Community Access Road, fostering a deeper level of engagement and commitment to the Community Access Road's success.

11.3.2 Neighbouring Indigenous Communities

The term "neighbouring" is used to identify any Indigenous community being consulted and engaged with respect to the Community Access Road; the term is not in reference to proximity. Marten Falls First Nation is regarded as both the Proponent and the most potentially impacted community; and participates in consultation and engagement activities for neighbouring Indigenous communities.

Table 11-1 lists the neighbouring Indigenous communities, as identified by the Ministry of the Environment, Conservation and Parks (A. Cross, 2018, personal communication), to be consulted based on their constitutionally protected Aboriginal and / or Treaty Rights that may be adversely affected by the Community Access Road, or who may be interested in the Community Access Road. This list was later identified in the Marten Falls-Ontario Memorandum of Understanding on Shared Consultation Responsibilities in 2020, and then later updated to include Long Lake #58 First Nation on a rights basis (L. Churchill, 2020, personal communication). Neighbouring Indigenous communities are official representatives of an Indigenous community as opposed to interested community members, who are categorized as interested persons.

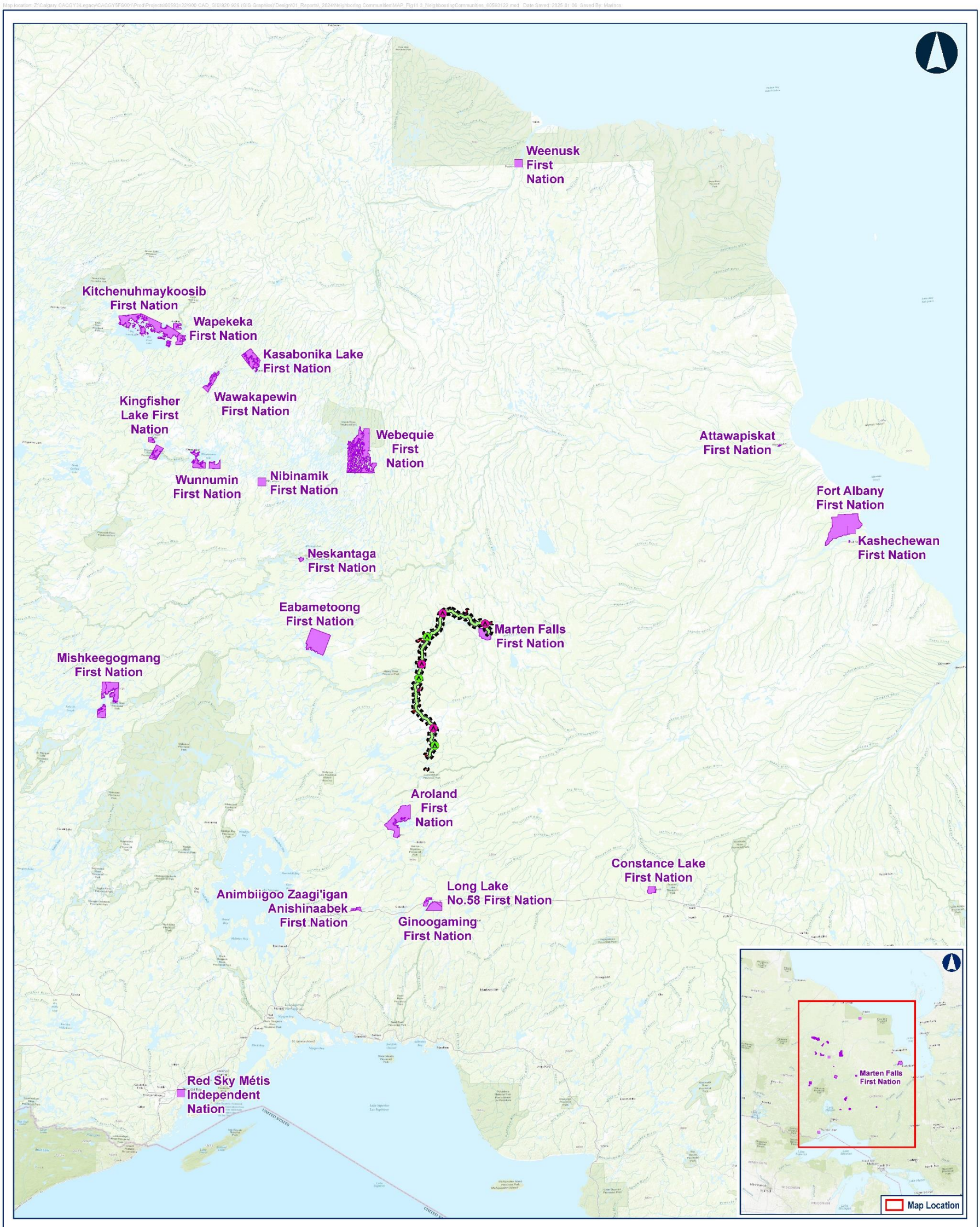
The list of neighbouring Indigenous communities also includes communities listed in the Agency's Preliminary List of Indigenous Communities for Proponent Engagement on the Marten Falls Access Road, with the addition of Mishkeegogamang First Nation; this was the only additional community on the Agency's list that was not on the Ministry of the Environment, Conservation and Parks' list.

Table 11-1: Indigenous Communities and their Affiliations

Tribal Council Affiliation	Community or Organization
Matawa First Nations Management (Nishnawbe Aski Nation)	• Marten Falls First Nation (Proponent and potentially affected Indigenous community) • Aroland First Nation • Constance Lake First Nation • Eabametoong First Nation (Fort Hope) • Ginoogaming First Nation • Neskantaga First Nation • Nibinamik First Nation • Webequie First Nation
Matawa First Nation and the Union of Ontario Indians (Nishnawbe Aski Nation)	• Long Lake #58 First Nation
Mushkegowuk Council (Nishnawbe Aski Nation)	• Attawapiskat First Nation • Fort Albany First Nation • Kashechewan First Nation
Shibogama First Nations Council (Nishnawbe Aski Nation)	• Kasabonika Lake First Nation • Kingfisher Lake First Nation • Wapekeka First Nation • Wawakapewin First Nation • Wunnumin Lake First Nation
Independent First Nations Alliance	• Kitchenuhmaykoosib Inninuwug First Nation
Independent First Nations (Nishnawbe Aski Nation)	• Mishkeegogamang First Nation • Weenusk First Nation
Nokiiwin Tribal Council	• Animbiigoo Zaagi'igan Anishinaabek
Métis Nation of Ontario (For the purpose of engagement on the Community Access Road, it was advised by Métis Nation of Ontario in December 2023 to combine engagement and communication with Métis Nation of Ontario, Greenstone Métis Council, and Métis Nation of Ontario Region 2 under the name of Métis Nation of Ontario in the record of consultation. This merge was requested to reduce duplications for staff and occurred in December 2024).	• Métis Nation of Ontario, Region 2 and Greenstone Métis Council
Independent Métis Nation	• Red Sky Métis Independent Nation

Figure 11-2 shows the location of neighbouring Indigenous communities in proximity to the Community Access Road.

Figure 11-2: Location of Neighbouring Indigenous Communities



To help achieve an appropriate level of consultation and engagement related to the Community Access Road (in terms of frequency and depth), the list of communities being engaged was evaluated based on the following criteria:

- Expressed interest (to date) in the Community Access Road, including applying to Ministry of Energy and Mines, and the Agency for capacity funding;
- Aboriginal and / or Treaty Rights, including any rights that neighbouring Indigenous communities themselves have identified, that may be adversely affected by the Community Access Road;
- Geographical distance or proximity to the study area;
- Located downstream of the Community Access Road, with the potential to experience effects on watercourses due the Community Access Road;
- Traditional and / or current land use within the study area or of lands potentially affected by the Community Access Road;
- Potential for effects on the environmental and community well-being (social, economics, and human health conditions) of neighbouring Indigenous communities; and
- Provided comments during the Assessment Process.

Throughout the Assessment Process, Marten Falls First Nation adjusted its approach to engaging with each Indigenous community based on these criteria, evolving the list as new information became available and additional neighbouring Indigenous communities engaged in the consultation and engagement opportunities.

The above criteria were also used to identify which communities were offered funding to participate in the Indigenous Knowledge Program and the Community Capacity Funding Program[2] (formerly known as the Community Coordinator Program). A description of the Indigenous Knowledge Program and the Community Coordinator Program / Community Capacity Funding Program is provided in **Sections 11.3.3** and **11.3.4**, respectively.

2. To better serve the interest of Indigenous communities in reviewing the Draft Environmental Assessment / Impact Statement, the Community Coordinator Program was replaced with the Community Capacity Funding Program in November 2024.

11.3.3 Indigenous Knowledge Program

In December 2019, the Project Team introduced the Indigenous Knowledge Program. An important part of the Assessment Process is collecting Indigenous Knowledge and information on Indigenous land and resource use to help understand existing conditions and predict the potential effects of the Community Access Road, including impacts to Aboriginal and / or Treaty Rights and Interests. To honour and respect Indigenous Knowledge, a Sharing Agreement was developed with each community that chose to participate in the program. The agreements outlined how confidential and sensitive information will be protected and inform the Assessment Process.

Funding to participate in the Indigenous Knowledge Program was also provided, with six Indigenous communities receiving funding to date and one additional community currently in the process of receiving funding. As of September 5, 2025, Indigenous Knowledge was received from Marten Falls First Nation, Animbiigoo-Zaagi'igan Anishinaabek, Aroland First Nation, Fort Albany First Nation, Ginoogaming First Nation, Kashechewan First Nation, and Weenusk First Nation. For a summary of those who participated in the Indigenous Knowledge Program and / or received funding to do so (by September 5, 2025), refer to **Table 11-2**.

Communities who expressed interest, or did not respond to outreach, continued to be encouraged to participate in the Indigenous Knowledge Program through regular outreach and offering of funding; this encouragement continued throughout the Assessment Process. Alternative methods of consultation were also offered to communities who declined to participate in the Indigenous Knowledge Program. For example, opportunities to meet with the Marten Falls First Nation Project Team or funding through the Community Coordinator Program / Community Capacity Funding Program.

11.3.4 Community Coordinator Program / Community Capacity Funding Program

A Community Coordinator Program, with funding, was developed to support the participation of specific Indigenous communities in consultation and engagement activities for the Community Access Road. This program, which started in April 2022, was designed to assist communities participate in the Assessment Process in ways that worked best for each community. It was expected that the program would continue until the submission of the Final Environmental Assessment / Impact Statement. Refer to **Section 11.3.2** for a list of criteria used to determine eligibility.

Community Coordinators were envisioned to support Community Access Road consultation and engagement activities, meetings, and events by helping collect input from community members to share with the Project Team for inclusion in the Assessment Process.

Since the start of the program, Marten Falls First Nation has had two Community Coordinators; one former and one current, with a period during which their responsibilities overlapped. Communications and meetings with other communities regarding their interest in participating continued until the program ended in October 2024; at that time no other neighbouring Indigenous communities had chosen to participate.

Due to limited uptake, the Community Coordinator Program was reimagined as the Community Capacity Funding Program. It was introduced in November 2024 to offer flexible funding to support communities in reviewing the Draft Environmental Assessment / Impact Statement, and participating in consultation and engagement activities. This one-time capacity funding payment was designed to support engagement in the Community Access Road in a way that best suited the unique needs of each eligible Indigenous community.

The timing of the shift in funding programs coincided with preparations for release of the Draft Environmental Assessment / Impact Statement. Considering the importance of gaining Indigenous communities' feedback on the Draft, the Project Team provided financial support to assist with this review. This new approach provided communities the flexibility and autonomy to allocate funds as needed.

As of September 5, 2025, nine communities had been provided with Community Capacity Funding. For a summary of those who participated in either the Community Coordinator Program or the Community Capacity Funding (by September 5, 2025), refer to **Table 11-2**. Of note, Eabametoong First Nation and Long Lake #58 First Nation had also expressed interest in Community Capacity Funding but had not yet advanced the steps necessary to obtain funding (for example, signing the funding agreement or providing banking information).

This redirected approach resulted in more capacity for participation in consultation and engagement for the Community Access Road. During the timeline of the Community Coordinator Program, only one community participated, whereas nine communities received Community Capacity Funding and all those who received funding provided feedback on the Draft Environmental Assessment / Impact Statement (as of September 5, 2025), with the exception of the Proponent, Marten Falls First Nation.

Table 11-2: Status of Neighbouring Indigenous Communities' Participation in the Community Capacity Funding Program and the Indigenous Knowledge Program

No.	Indigenous Community	Status of Uptake in Community Capacity Funding Program and Comments on the Draft Environmental Assessment / Impact Statement	Status of Uptake for Community Coordinator Program	Status of Funding Offer for Indigenous Knowledge Program
1	Aroland First Nation	• Funding provided • Aroland First Nation provided comments on the Draft Environmental Assessment / Impact Statement	• Aroland First Nation was reviewing applicants for the position • The Community Coordinator Program was amended to the Community Capacity Funding Program in advance of an applicant being selected by the community	• Funding Provided • Received Indigenous Knowledge from the community
2	Attawapiskat First Nation	• Capacity Funding information sent to community • No response received • Attawapiskat First Nation provided comments on the Draft Environmental Assessment / Impact Statement	• Offered • No response received	• Indicated they do not want to participate in the Indigenous Knowledge Program
3	Animbiigoo-Zaagi'igan Anishinaabek	• Funding provided • Animbiigoo-Zaagi'igan Anishinaabek provided comments on the Draft Environmental Assessment / Impact Statement	• Offered • No response received	• Funding provided • Received Indigenous Knowledge from the community
4	Constance Lake First Nation	• Funding provided • Contance Lake First Nation provided comments on the Draft Environmental Assessment / Impact Statement	• Offered • Expressed interest; noted difficulty finding resource to fill role • The Community Coordinator Program was amended to the Community Capacity Funding Program in advance of an applicant being selected by the community	• The Sharing Agreement is with the community for signing • The updated funding agreement is with the community for review • Constance Lake First Nation did not provide Indigenous Knowledge
5	Eabametoong First Nation	• Community Capacity Funding information sent to community • Community acknowledged receipt of information and expressed interest. Follow-ups have been sent; no further response received regarding the program during the Assessment Process • Eabametoong First Nation provided comments on the Draft Environmental Assessment / Impact Statement, after the review period ended	• Offered • No response received	• Updated versions of the sharing and funding agreements are with the community for review • Eabamatoong First Nation did not provide Indigenous Knowledge
6	Fort Albany First Nation	• Funding provided • Fort Albany First Nation provided comments on the Draft Environmental Assessment / Impact Statement	• Offered • Acknowledged offer • The Community Coordinator Program was amended to the Community Capacity Funding Program in advance of an applicant being selected by the community	• Funding provided • Received Indigenous Knowledge from the community
7	Ginoogaming First Nation	• Funding provided • Ginoogaming First Nation provided comments on the Draft Environmental Assessment / Impact Statement	• Offered • Have expressed interest in program; actively recruiting • The Community Coordinator Program was amended to the Community Capacity Funding Program in advance of an applicant being selected by the community	• Funding provided • Received Indigenous Knowledge from the community
8	Kasabonika Lake First Nation	• Community Capacity Funding information sent to community • No response received • Kasabonika Lake First Nation did not provide comments on the Draft Environmental Assessment / Impact Statement	• Offered • No response received	• Updated versions of the sharing and funding agreements are with the community for review • Kasabonika Lake First Nation did not provide Indigenous Knowledge

No.	Indigenous Community	Status of Uptake in Community Capacity Funding Program and Comments on the Draft Environmental Assessment / Impact Statement	Status of Uptake for Community Coordinator Program	Status of Funding Offer for Indigenous Knowledge Program
9	Kashechewan First Nation	• Funding provided • Kashechewan First Nation provided comments on the Draft Environmental Assessment / Impact Statement	• Offered • Acknowledged offer • The Community Coordinator Program was amended to the Community Capacity Funding Program in advance of an applicant being selected by the community	• Funding provided • Received Indigenous Knowledge from the community
10	Long Lake #58 First Nation	• Community Capacity Funding information sent to community • Community acknowledged receipt of information and expressed interest; Community Capacity Funding Agreement has been sent to the community • Long Lake #58 First Nation did not provide comments on the Draft Environmental Assessment / Impact Statement	• Offered • Acknowledged offer • The Community Coordinator Program was amended to the Community Capacity Funding Program in advance of an applicant being selected by the community	• Initial versions of sharing and funding agreements sent to the community • Long Lake #58 First Nation did not provide Indigenous Knowledge
11	Marten Falls First Nation	• Funding provided • Marten Falls First Nation did not provide comments on the Draft Environmental Assessment / Impact Statement	• One previous Community Coordinator hired (living in Marten Falls); one current Community Coordinator (living outside of Marten Falls) • Funding provided	• Funding provided • Received Indigenous Knowledge from the Community
12	Neskantaga First Nation	• Community Capacity Funding information sent to community • No response received • Neskantaga First Nation did not provide comments on the Draft Environmental Assessment / Impact Statement	• Offered • No response received	• Updated versions of the sharing and funding agreements are with the community for review • Neskantaga First Nation did not provide Indigenous Knowledge
13	Nibinamik First Nation	• Funding provided • Nibinamik First Nation provided comments on the Draft Environmental Assessment / Impact Statement	• Offered • No response received	• Initial versions of the sharing and funding agreements sent to the community • Nibinamik First Nation did not provide Indigenous Knowledge
14	Webequie First Nation	• Community Capacity Funding information sent to community • No response received • Webequie First Nation did not provide comments on the Draft Environmental Assessment / Impact Statement	• Offered • No response received	• Updated versions of the sharing and funding agreements are with the community for review • Webequie First Nation did not provide Indigenous Knowledge
15	Weenusk First Nation	• Funding provided • Weenusk First Nation provided comments on the Draft Environmental Assessment / Impact Statement	• Offered • Acknowledged offer • The Community Coordinator Program was amended to the Community Capacity Funding Program in advance of an applicant being selected by the community	• The final versions of the sharing and funding agreements have been signed by the Project Team and the community • Once banking information is shared by Weenusk First Nation, funding for Indigenous Knowledge will be provided to Weenusk First Nation • Received Indigenous Knowledge from the community

Ongoing outreach continued for communities who did not respond; this encouragement continued throughout the Assessment Process. Alternative methods of consultation were also offered to communities who declined to participate (for example, opportunities to meet with the Project Team).

The Record of Consultation and Engagement for Indigenous Communities is available in **Appendix X** with additional information.

11.3.5 Interested Persons

Interested persons are defined as individuals and groups (for example, associations, non-governmental organizations, industry, and academia) who could have an interest in the Community Access Road. This includes, but is not limited to, communities in the region, those with commercial interests in the area (for example, forestry, trappers, outfitters, and other mineral tenure holders), and recreational users (for example, campers, hunters, and environmental groups). Interested persons also include individual members of an Indigenous community who are interested in the Community Access Road, as opposed to official representatives of an Indigenous community.

Marten Falls First Nation has consulted and engaged with members of the public, as listed in the Public Participation Plan for the Marten Falls Community Access Road (Impact Assessment Agency of Canada, 2020c), with the following exceptions:

- Anishinabek Nation asked to be removed from the contact list in 2023; and
- Noront Resources Ltd. was removed from the contact list in 2023 following updates from the provincial government. Noront Resources Ltd. was renamed to Ring of Fire Metals and has been re-added to the contact list.

Members of the public and anyone interested in the Community Access Road have been able to join the contact list to receive frequent updates.

Section 11.7.3 provides a complete list of consultation and engagement activities for interested persons. **Section 11.7.3.4** summarizes key input received from interested persons and how it has been considered. Additionally, the Record of Consultation and Engagement for Interested Persons is available in **Appendix X**.

11.3.6 Crown Government Agencies and Municipalities

11.3.6.1 Federal and Provincial Agencies

Throughout the Assessment Process, constructive dialogues were established with various Crown government agencies. These agencies provided critical input, particularly

on environmental, cultural, social, and economic aspects of the Community Access Road. Their feedback has been instrumental in shaping the approach to the Community Access Road and ensuring compliance with regulatory frameworks. The following Crown government agencies were engaged:

- Canada Energy Regulator;
- Canadian Forest Service;
- Crown-Indigenous Relations and Northern Affairs Canada;
- Department of Fisheries and Oceans Canada;
- Employment and Social Development Canada;
- Environment and Climate Change Canada;
- Health Canada;
- Impact Assessment Agency of Canada;
- Indigenous and Northern Affairs Canada;
- Indigenous Services Canada;
- Infrastructure Canada;
- Infrastructure Ontario;
- Innovation, Science and Economic Development Canada;
- Natural Resources Canada;
- Nav Canada;
- Ontario Ministry of Citizenship and Multiculturalism;
- Ontario Ministry of Economic Development, Job Creation and Trade;
- Ontario Ministry of Finance;
- Ontario Ministry of Indigenous Affairs and First Nations Economic Development;
- Ontario Ministry of Mines;
- Ontario Ministry of Municipal Affairs and Housing;
- Ontario Ministry of Natural Resources;
- Ontario Ministry of Northern Development;
- Ontario Ministry of the Environment, Conservation and Parks;
- Ontario Ministry of the Solicitor General;
- Ontario Ministry of Tourism, Culture and Gaming;
- Ontario Ministry of Transportation;
- Ontario Parks;
- Transport Canada; and
- Treasury Board of Canada Secretariat.

Table 11-7 provides a list of consultation and engagement activities conducted between October 29, 2021, and September 5, 2025, with government agencies. **Section 11.7.4** summarizes key input received from government agencies and how it has been considered.

11.3.6.2 Municipalities

Municipalities were engaged to help ensure local concerns and perspectives were adequately represented. This engagement helped the Project Team be aware of local development plans and community needs. The following municipalities and groups representing municipal interests were included:

- Municipality of Sioux Lookout;
- Kenora District Services Board;
- Municipality of Greenstone;
- District of Thunder Bay Social Services Administration Board;
- Cochrane District Social Services Administration Board;
- City of Thunder Bay; and
- The Corporation of the City of Timmins.

Table 11-7 provides a list of consultation and engagement activities conducted between October 29, 2021, and September 5, 2025, with municipalities (under the government agencies column). **Section 11.7.4** summarizes key input received from municipalities and how it has been considered.

Additionally, the Record of Consultation and Engagement for Government Agencies is available in **Appendix X**.

11.4 Consultation and Engagement Milestones, Input, and Timing

Consultation and engagement at each milestone were designed to receive feedback on targeted input before advancing to the next stage of the Assessment Process. **Table 11-3** outlines each milestone, its timing, and the targeted input and feedback requested.

Table 11-3: Milestones, Input, and Timing

Milestone	Targeted Input	Timing
Milestone 1: Notice of Commencement of Environmental Assessment	• Requested information to determine and identify: – Level of interest in the Community Access Road; – Level of interest in meetings / discussions with Chiefs and Councils and / or Indigenous communities; – How Indigenous communities would like to be kept informed during the Assessment Process; and – Level of interest in creating Indigenous community-specific consultation and engagement plan(s) as they relate to the Assessment Process.	October 29, 2021, to June 30, 2022
Milestone 2: Effects Assessment Methods	• Obtained feedback on: – Consultation and engagement approach; – Planned existing conditions field programs; – Existing conditions and results of field programs completed; – The Assessment Process; – Local and regional study areas, Community Access Road phases, criteria and indicators, interactions between the Community Access Road and the environment, and net effects characteristics; • Requested information to identify: – Indigenous community values and topics of interest; – Potential effects and impact management measures; – Effects of the Community Access Road on Aboriginal or Treaty Rights and potential impact management measures to avoid, mitigate, and offset effects; • Confirmed, through early release of community-specific Progress Report 1 for consultation and engagement, whether input and feedback provided during the previous milestone was captured appropriately; and • Shared an explainer video on cumulative effects on the Community Access Road website and notified via the October 2022 Community Access Road Newsletter.	July 1, 2022, to May 31, 2023
Milestone 3: Identification of Preferred Alternatives	• Obtained feedback on alternative routes: – Proposed mitigation measures; – Categories (for example, natural / physical, social, economic, and cultural) and technical / cost aspects that were considered in the route selection; – High-level comparative analysis of the potential net effect between the alternatives; – Results of the comparative analysis of advantages and disadvantages; – Preferred Route selected; – Preliminary road design, to the extent available; • Cumulative effects assessment methodology and Project Inclusions List requested information to identify: – Potential follow-up program measures including monitoring measures and adaptive management; – Potential projects and activities that could act cumulatively with the Community Access Road; – How Indigenous communities can participate in the Community Access Road; – Potential cumulative effects to be considered; and • Confirmed through early release of community-specific Progress Report 2 for consultation and engagement whether input and feedback provided during the previous milestone was captured appropriately.	June 1, 2023, to July 31, 2024
Milestone 4: Review of Draft Environmental Assessment / Impact Statement	• Obtained feedback on: – Ongoing issues resolution during the environmental assessment milestone; – Draft Environmental Assessment / Impact Statement; – Proposed impact management measures and follow-up program measures, including monitoring; – Measures and adaptive management plan(s); – Cumulative effects assessment results; – Draft Environmental Assessment / Impact Statement conclusions; and • Confirmed through early release of community-specific Progress Report 3 for consultation and engagement, the Draft Record of Consultation and Engagement for Interested Persons, and the Draft Environmental Assessment / Impact Statement) whether input and feedback provided during the previous milestone was captured appropriately.	August 1, 2024, to September 5, 2025
Milestone 5: Review of Final Environmental Assessment / Impact Statement	• Confirm through release of the last Progress Report (4) for Indigenous communities whether input and feedback provided during the previous milestone was captured appropriately. • Review the Final Environmental Assessment / Impact Statement (not part of this consultation and engagement reporting time period).	September 6, 2025, to February 20, 2026, (Proponent-led consultation and engagement ended February 20, 2026, with the initiation of regulator consultation and engagement February 20, 2026).

As noted in **Table 11-3**, Proponent-led consultation and engagement officially ends with the submission of the Final Environmental Assessment / Impact Statement to the regulators. Consultation and engagement during the review of the Final Environmental Assessment / Impact Statement is undertaken by the federal and provincial government agencies. The Proponent, however, will support the regulator's review process as necessary up until the regulators' decision is made (for example, provide responses to comments, attend meetings as requested).

11.5 How We Engaged

Consultation and engagement for the Community Access Road involved a range of methods and communication channels applied throughout Milestones 1, 2, 3, and 4. These methods supported consistent sharing of information, opportunities for consultation and engagement, and the collection of feedback from Indigenous communities, government agencies, and interested persons.

Section 11.5 describes the broader consultation and engagement activities used to communicate and engage with audiences interested in the Community Access Road, including Indigenous communities, interested persons, and government agencies. Those described below, however, are only a subset of the outreach conducted throughout the Assessment Process. Consultation and engagement was also specifically tailored to meet the unique needs of those being engaged. For example, provincially-supported events—like the Three-Road Project Expo and Gathering and the Aboriginal and / or Treaty Rights and Interests Forum—offered a space for Indigenous communities to gather over several days to collect information and discuss their values and interests. In addition, Indigenous communities were encouraged to meet with the Project Team throughout the Assessment Process; **Table 11-7** provides a summary of the meetings held and **Section 11.7.2** provides more information on those activities tailored for Indigenous communities.

Table 11-7 provides an overview of activities undertaken through Milestones 1, 2, 3, and 4. Communication and engagement activities that were tailored to a specific audience are summarized in **Section 11.7**. Detailed descriptions of all activities listed below are available in **Appendix X,** the Record of Consultation and Engagement, including detailed records of meetings, correspondence, notices, and participation.

11.5.1 Notice of Commencement of Environmental Assessment

On October 29, 2021, the Notice of Commencement of Environmental Assessment was circulated to Marten Falls First Nation, neighbouring Indigenous communities, government agencies, and interested persons, including individuals or groups that are potentially affected by the Community Access Road and / or have an interest in the Community Access Road.

The Notice of Commencement of Environmental Assessment was circulated via email on October 29, 2021, to individuals and groups on the contact list; this list was kept up-to-date throughout the Assessment Process. Notices were also distributed via mail and fax on November 1, 2021. Additionally, radio and newspaper advertisements were also placed.

The Notice of Commencement of Environmental Assessment was also made available on the Project website in English, French, Ojibway, Oji-Cree, and Cree.

11.5.2 Website

The Community Access Road website was developed to provide ongoing access to information about the Project and planned consultation and engagement activities; consideration was given to allow users with low bandwidth and slow internet connection to easily access information. The website was continuously updated throughout the Assessment Process and information was published at key milestones. Examples of posted information include frequently asked questions, Assessment Process information and timelines, videos and webinar recordings, news stories, information on the Indigenous Knowledge Program; and existing publicly available documentation and reports (including the Draft Environmental Assessment / Impact Statement, summary reports, field notices). A contact page was also available for anyone to submit questions, comments, or concerns. The website also reflected information that had been shared via the E-blasts and social media accounts.

11.5.3 Social Media

The Community Access Road social media accounts (Facebook, Instagram, and LinkedIn) were used to share ongoing updates about the Community Access Road and upcoming consultation and engagement activities. Regular posts were shared that provided information on field updates, E-blasts, videos and webinars, Public Information Centres, and information on reports, including the Draft Environmental Assessment /

Impact Statement. Social media content reinforced information shared through the website and E-blasts, helping ensure updates were accessible to a wide audience.

11.5.4 Monthly E-Blasts

Throughout the Assessment Process, newsletters (also known as E-blasts) were distributed via email to the approximately 600 people identified on the contact list. E-blasts were distributed monthly and included Community Access Road updates relevant to the month of distribution (for example, upcoming field programs, report distributions, and engagement activities). Links to the Community Access Road's social media pages and contact information were included. Additionally, E-blasts were published on the Community Access Road website, receiving over 9,596 views.

11.5.5 Field Program Notifications

To help understand the field programs related to valued components, field notices were distributed with plain language information about what the Project Team is studying, why it is important, when the field programs are taking place, and what to expect when crews were in the field (for example, an increase in air traffic as crews travel by helicopter). Field notices encouraged recipients to contact the Project Team if they had any questions or comments. Typically, discussion guides were distributed in advance of field notices with key questions to help shape programs (including timing and locations); however, some field programs required quick mobilization (such as winter programs dependent on snowfall) and discussion guides were distributed at the same time as field notices. Notices were distributed via email to persons identified on the contact list prior to the relevant field program taking place.

11.5.6 Discussion Guides

Discussion guides for various field programs were shared with the Community Access Road contact list prior to the commencement of field programs. These guides provided an overview of the upcoming field program, solicited feedback on key questions listed in the guide, and encouraged interested individuals to book a meeting with the Project Team to discuss their questions and concerns, as well as their Aboriginal and / or Treaty Rights and Interests in the study area. The discussion guides received over 1,871 views. Insights shared by Indigenous communities and interested persons had the opportunity to help shape and enrich the field programs.

Typically, after the discussion guides were distributed and feedback was collected (if provided), a field notice was distributed with confirmed dates for the field programs. Additional information related to planned field programs was also included in the

monthly E-blasts and shared through social media. A web-based version, with an online survey, was also made available on the Community Access Road website.

11.5.7 Public Information Centres

Four Public Information Centres were held throughout Milestones 1, 2, 3, and 4. Note that Public Information Centre #1 and #2 were part of the Terms of Reference so descriptions are therefore not included. A fifth Public Information Centre (Public Information Centre #7) was held outside of the reporting period and is summarized in **Section 11.811.9**.

A detailed description of Public Information Centres, including the materials presented, comments, questions, and responses (via summary report) is available in **Appendix X**, the Record of Consultation and Engagement for Interested Persons.

11.5.7.1 Public Information Centre #3

Notification: On June 13, 2022, a notice was circulated to the Marten Falls First Nation community, neighbouring Indigenous communities, government agencies, and interested persons regarding Public Information Centre #3. The notice was provided via both hard and electronic copies (for example, mail, email) and posted on the Community Access Road website on June 13, 2022, in English, French, Cree, Ojibway, and Oji-Cree. The notice was also published between June 14 and 17, 2022, in various newspapers. Online advertisements were posted from June 13 to 27, 2022, through various media outlets. Radio advertisements were also released during the same period. Additionally, the Public Information Centre was advertised on the Community Access Road Facebook page and the private Marten Falls First Nation Facebook page.

Dates and Locations: June 27, 2022, in Thunder Bay and on June 29, 2022, in the Municipality of Greenstone (Geraldton).

Objectives and Topics: Public Information Centre #3 provided an update on the Community Access Road, including: updates since the Terms of Reference; the Assessment Process; study areas, including specific updates made to reflect potential sources of aggregate material and input received from Indigenous communities; preliminary results of field programs and information on upcoming field programs; overview and importance of Indigenous Knowledge and Aboriginal and / or Treaty Rights and Interests; how Indigenous communities have been involved to date and plans for future consultation and engagement; feedback heard to date and how it is being considered; ongoing and future consultation and engagement opportunities; and next steps.

Attendees: Approximately 33 individuals attended Public Information Centre #3; 25 attendees in Thunder Bay on June 27, 2022, and 8 attendees in Geraldton on June 29, 2022. Attendees included Indigenous community members, government agencies, members of the public / local residents, environmental groups, and industry representatives. Attendees (and members of the following groups) included:

- Marten Falls First Nation;
- Aroland First Nation;
- Ring of Fire Metals (formerly known as Noront Resources Ltd.);
- The BMI Group;
- Ministry of Energy and Mines;
- Mishkeegogamang First Nation;
- Ne-Daa-Kii-Me-Naan Inc. (Nedaak);
- Thunder Bay residents; and
- Geraldton residents.

One staff member from the Ministry of Energy and Mines was also present to provide a brief update and assist in answering questions.

11.5.7.2 Public Information Centre #4

Notification: A formal notice and invitation to Public Information Centre #4 was published on the Community Access Road website on November 22, 2022, in English, French, Cree, Ojibway, and Oji-Cree. The notice was published between November 22 and December 1, 2022, in various newspapers. Online advertisements were also posted / released through various media outlets between November 22 and December 9, 2022, and radio advertisements were released between November 28 to December 9, 2022, on various radio stations. Additionally, the Public Information Centre was advertised on the Community Access Road Facebook page and the private Marten Falls First Nation Facebook page.

Dates and Locations: December 7, 2022, in Thunder Bay and on December 8, 2022, in Geraldton.

Objectives and Topics: Public Information Centre #4 provided an update on the Community Access Road, including: an overview and updates since Public Information Centre #3, as well as what was heard and how feedback was considered; existing conditions results for completed studies; assessment of impacts and comparison of route alternatives; preliminary results of field programs and information on upcoming field programs; overview and importance of Indigenous Knowledge and Aboriginal and /

or Treaty Rights and Interests; process for identifying the preliminary technically preferred route and how route alternatives would be assessed, recommended and a Preferred Route chosen; and next steps.

Attendees: Approximately 46 individuals attended Public Information Centre #4; 30 attendees in Thunder Bay on December 7, 2022, and 16 attendees in Geraldton on December 8, 2022. Attendees included Indigenous community members, government agencies, members of the public / local residents, environmental groups, and industry representatives. Attendees (and members of the following groups) included:

- Marten Falls First Nation;
- Ring of Fire Metals;
- Mining Claim Holders;
- Thunder Bay News Watch;
- Lakehead University students;
- LTL Environmental;
- Métis Nation of Ontario;
- Greenstone Council;
- Thunder Bay residents; and
- Geraldton residents.

Staff from the Ministry of Energy and Mines as well as Ministry of Natural Resources were present to provide a brief update and assist in answering questions.

11.5.7.3 Public Information Centre #5

Notification: A formal notice and invitation to Public Information Centre #5 was published on the Community Access Road website on October 10, 2023, in English, French, Cree, Ojibway, and Oji-Cree. The notice was published between October 19 and 23, 2023, in various newspapers. Online advertisements were also posted / released through various media outlets between October 11 and October 26, 2023, and radio advertisements were released between October 11 and October 26, 2023. Additionally, the Public Information Centre was advertised on the Community Access Road Facebook and LinkedIn pages and the private Marten Falls First Nation Facebook page.

Dates and Locations: October 25, 2023, in Thunder Bay and on October 26, 2023, in Geraldton.

Objectives and Topics: Public Information Centre #5 provided an update on the Community Access Road, including: current stage of the process, as well as the different construction steps needed to build a road; what has happened since Public Information Centre #4, including what was heard and how feedback was considered; what was heard at the Aboriginal and / or Treaty Rights and Interests Forum in February 2023 and plans for the next forum; existing conditions results for completed studies; how Indigenous Knowledge was used and how it informed the process; preliminary technically Preferred Route recommendation, how route alternatives were assessed, recommended and a preliminary technically Preferred Route chosen; cumulative effects assessment, including why it is important and the Project Inclusions List; and next steps and future opportunities to get involved.

Attendees: Approximately 35 individuals attended Public Information Centre #5; 21 attendees in Thunder Bay on October 25, 2023, and 14 attendees in Geraldton on October 26, 2023. Attendees included Indigenous community members, government agencies, members of the public / local residents, environmental groups, and industry representatives. Attendees (and members of the following groups) included:

- Marten Falls First Nation;
- Eabametoong First Nation;
- South Gillis residents;
- Jellico residents;
- Thunder Bay residents;
- Geraldton residents;
- North Superior Workforce Planning;
- Outland / Horizon North;
- Far North District;
- Ministry of Natural resources and Forestry;
- Representative for Member of Provincial Parliament, Kevin Holland;
- Municipality of Greenstone; and
- Longlac-Greenstone Council.

11.5.7.4 Public Information Centre #6

Notice: A formal notice and invitation to Public Information Centre #6 was combined with the Notice of the Draft Environmental Assessment / Impact Statement and was published on the Community Access Road website on April 22, 2025, in English, French, Cree, Ojibway, and Oji-Cree. The notice was published between April 22 and

May 26, 2025, in various newspapers and radio stations. Additionally, the Public Information Centre was advertised on the Community Access Road Facebook, Instagram, and LinkedIn pages and the private Marten Falls First Nation Facebook page.

Dates and Locations: May 26, 2025, in Thunder Bay, and May 29, 2025, in Geraldton

Objectives and Topics: Public Information Centre #6 focused on the Draft Environmental Assessment / Impact Statement, community well-being, and cumulative effects. Information included: Draft Environmental Assessment / Impact Statement review process and schedule; ways to review and provide comments; feedback received to date; land and resource use; information on the Country Foods Program; potential effects and mitigations; cumulative effects process and results; final projects / activities considered as part of the Cumulative Effects Assessment; and, how the Community Access Road could affect community well-being for Marten Falls and nearby communities.

Attendees: Approximately 27 individuals attended Public Information Centre #6; 11 attendees in Thunder Bay on May 26, 2025, and 16 in Geraldton on May 29, 2025. Attendees included Indigenous community members, federal and provincial agencies, members of the public / local residents, environmental groups, and industry representatives. Attendees (and members of the following groups) included:

- Marten Falls First Nation members;
- Thunder Bay residents;
- Geraldton residents;
- Far North Resources Group;
- Four Rivers Environmental Services Group;
- Ministry of Natural Resources;
- Long Lake #58 First Nation members;
- Mushkegowuk Council;
- Municipality of Greenstone; and
- Longlac-Greenstone Council.

11.5.8 Webinars

Notifications for webinars were distributed via email to the contact list and posted on social media platforms including the Community Access Road Facebook page and the private Marten Falls First Nation and Ogoki Facebook page, on an as needed basis. Later in the Assessment Process, information was also posted to LinkedIn and

Instagram, starting November 2023 and March 2024, respectively. Notifications included the date and time of the webinar, links for registration, and webinar poster attachments. Reminder emails were sent shortly before the live webinar occurred.

11.5.8.1 Webinar Series 1: Valued Components

A total of 12 webinars were held in the first series, resulting in 40 questions and 279 views of the recordings. This first webinar series focused on sharing information about what was studied (also known as “valued components”), how and why. This included both Indigenous Knowledge and western science. **Table 11-4** outlines registration and attendance numbers, and recording views, for each webinar in the valued components series.

Table 11-4: Webinar Series 1 Details

Webinar Topic	Date	Engagement
Animals and Wildlife, Ungulates, and Furbearers	November 15, 2022	• 24 registered, 15 attended • 29 viewed the recording.
Surface Water, Fish and Fish Habitat	November 29, 2022	• 8 registered, 5 attended • 19 viewed the recording.
Archaeology and Cultural Heritage	January 10, 2023	• 12 registered, 8 attended • 47 viewed the recording
Vegetation and Physiography	January 18, 2023	• 11 registered, 9 attended • 20 viewed the recording.
Peatlands	January 31, 2023	• 18 registered, 13 attended • 21 viewed the recording
Air Quality, Greenhouse Gases, and Climate Change	February 14, 2023	• 7 registered, 5 attended • 19 viewed the recording
Socio-Economic Part 1	February 21, 2023	• 10 registered, 7 attended • 18 viewed the recording
Socio-Economic Part 2	February 28, 2023	• 2 registered, 2 attended • 16 viewed the recording
Groundwater and Geochemistry	March 14, 2023	• 12 registered, 6 attended • 17 viewed the recording
Birds	March 21, 2023	• 11 registered, 10 attended • 22 viewed the recording
Reptiles, Amphibians, Insects, and Bats	March 28, 2023	• 7 registered, 5 attended • 15 viewed the recording
Aboriginal and / or Treaty Rights and Interests	April 4, 2023	• 6 registered, 5 attended • 25 viewed the recording.

11.5.8.2 Webinar Series 2: Technical Webinars

Three technical webinars were held, resulting in 23 questions and 201 views of the recording. This series provided an ongoing opportunity for communication, dialogue,

and participation among Indigenous community members and other interested persons regarding the technical aspects and planning for the Community Access Road. The goal of the webinar series was to share information about the technical considerations of the road as part of the Assessment Process, offer participants the chance to learn about topics of interest, and create space for meaningful feedback. This approach was intended to broaden our audience, encourage engagement, and helped to ensure the feedback received informed and helped to strengthen the Assessment Process.

Additionally, a post-webinar survey for the climate change webinar was provided. Nine people completed the post-webinar survey on climate change adaptation.

Table 11-5 outlines registration and attendance numbers, and recording views, for each webinar in the technical webinar series.

Table 11-5: Webinar Series 2 Details

Webinar Topic	Date	Engagement
Route Selection	November 16, 2023	• 36 registered, 24 attended • 13 viewed the recording
Building the Community Access Road	November 26, 2024	• 57 registered, 31 attended • 97 viewed the recording
Climate Change Adaptation (including post-webinar survey)	February 8, 2024	• 40 registered, 26 attended • 91 viewed the recording.

11.5.8.3 Webinar Series 3: Draft Environmental Assessment / Impact Statement

Four webinars were held, resulting in 15 questions asked and 43 views of the recordings. The Draft Environmental Assessment / Impact Statement webinar series was developed as part of a broader suite of resources designed to support Indigenous communities and other interested individuals in reviewing the Draft Environmental Assessment / Impact Statement. The webinars explored key valued components across three major topic areas: land, water, and people and guided participants through the assessment approach used in each study. This included an overview of existing conditions, potential effects, proposed mitigation measures, and an examination of residual and cumulative effects. Overall, the webinars provided a high-level introduction to what could be explored in greater depth within the full Draft Environmental Assessment / Impact Statement. **Table 11-6** outlines registration and attendance numbers, and recording views, for each webinar in the Draft Environmental Assessment / Impact Statement series.

Table 11-6: Webinar Series 3 Details

Webinar Topic	Date	Engagement
Community Well-Being	May 6, 2025	• 23 registered, 17 attended • 14 viewed the recording
Land Valued Components: Ungulates (Atik / Caribou & Mooz / Moose)	May 15, 2025	• 13 registered, 8 attended • 5 viewed the recording
Water: Fish and Fish Habitat	May 22, 2025	• 22 registered, 11 attended • 1 viewed the recording
Land and Resource Use	June 5, 2025	• 19 registered, 13 attended • 23 viewed the recording

11.5.9 Videos

Videos were posted to the Community Access Road website and included in relevant E-blasts, on an as needed basis. Videos were also shared to the Community Access Road Facebook, Instagram, and LinkedIn pages to encourage broader outreach.

Valued Component Videos:

- Thirteen videos on valued components provided information about what is being studied and why, what has already been learned, and how individuals can get involved;
- The videos have received a total of 2,056 views and 130 downloads.

Draft Environmental Assessment / Impact Statement Videos:

- Four videos on the Environmental Assessment / Impact Assessment provided information about the federal and provincial processes, the Draft Environmental Assessment / Impact Statement, cumulative effects, Project effects and mitigations, what the Project Team has heard from Indigenous communities and interested persons, and how individuals can get involved;
- The videos have received a total of 527 views.

11.6 Draft Environmental Assessment / Impact Statement

The Draft Environmental Assessment / Impact Statement was released in stages to support review by Indigenous communities, interested persons, and government regulators. Early release for Indigenous communities began on February 18, 2025, initiating a 120-day review period. The public and regulator review period began later, on April 22, 2025, for a 60-day review period. The comment period for Indigenous

communities, interested persons, and government regulators was initially scheduled to conclude on June 23, 2025, but extension requests from Indigenous communities and government regulators resulted in the review period being extended to September 5, 2025.

To fulfill federal requirements, an Assessment Summary of the Draft Environmental Assessment / Impact Statement (with sufficient details for the reader to understand the Community Access Road) was included as part of the distribution package. To provide readers with easy access to the information they value most, the Assessment Summary consisted of the following components:

- Marten Falls First Nation Chief's letter;
- An Introduction to the Assessment Summary;
- Executive Summary of the Draft Environmental Assessment / Impact Statement;
- Frequently Asked Questions: Draft Environmental Assessment / Impact Statement;
- An Introduction to the Plain Language Summaries and Technical Supporting Documents;
- Eleven technical discipline plain language summaries;
- Map of the Preferred Route;
- Cumulative Effects Inclusions List; and
- USB drive that included all the components listed above, the Draft Environmental Assessment / Impact Statement, and the Technical Support Documents.

The Assessment Summary was available on the Community Access Road website, for viewing at Public Information Centre #6, and at specific public library locations.

Throughout the review period for the Draft Environmental Assessment / Impact Statement, the Project Team welcomed comments by email, telephone, or mail. A total of more than 1,900 comments were received on the Draft Environmental Assessment / Impact Statement. Of these, over 1,000 comments were submitted by 9 Indigenous communities: Aroland First Nation, Animbiigoo Zaagi'igan Anishinaabek, Constance Lake First Nation, Fort Albany First Nation, Ginoogaming First Nation, Kashechewan First Nation, Mushkegowuk Council, Nibinamik First Nation, and Weenusk First Nation.

In addition, Attawapiskat First Nation submitted comments to the Ministry of the Environment, Conservation and Parks and the Impact Assessment Agency of Canada, copying the Project Team.

Comments from interested persons totaled 10 submissions, including comments from Wildlife Conservation Society Canada, Andomoozwe Outfitters, Albany-Ogoki Outposts, and members of the public.

All comments and responses are included in the Feedback and Response Log (**Appendix C**), which documents each submission, the Project Team's response, and whether changes were made to the Final Environmental Assessment / Impact Statement.

11.7 Consultation and Engagement by Audience

11.7.1 Activities Snapshot

Table 11-7 provides an overview of consultation and engagement activities with Marten Falls First Nation, neighbouring Indigenous communities, and interested persons during the first four milestones: Notice of Commencement of Environmental Assessment; Effects Assessment Methods; Identification of Preferred Alternatives; and Review of Draft Environmental Assessment / Impact Statement.

A high-level summary of issues and feedback received through consultation and engagement activities during these milestones is included in **Section 11.7.2** (Indigenous communities), **Section 11.7.3** (interested persons), and **Section 11.7.4** (government agencies). The sections also demonstrate whether the information received informed milestones of the Assessment Process.

Section 11.9 provides a summary of consultation and engagement activities that took place after the fourth milestone and before submission of the Final Environmental Assessment / Impact Statement. **Section 11.10** provides a summary of consultation and engagement during and after the submission of the Final Environmental Assessment / Impact Statement.

Table 11-7: Consultation Snapshot – From October 29, 2021, to September 5, 2025

Activity	Description	Indigenous Communities	Interested Persons	Government Agencies
Notice of Commencement	• Distribution of the Notice of Commencement of Environmental Assessment (October 29, 2021).	Yes	Yes	Yes
Notice of Commencement	• Notice of Commencement Advertisement (October 29 to November 12, 2021).	Yes	Yes	Yes
Interim Record of Consultation and Engagement	• Draft Interim Record of Consultation and Engagement distributed to Indigenous communities for review (December 6, 2022).	Yes	Not applicable	Not applicable
Interim Record of Consultation and Engagement	• Email follow-up distributed in January 2023.	Yes	Not applicable	Not applicable
Progress Report 1	• Draft progress report distributed to Indigenous communities for review (December 6, 2022).	Yes	Not applicable	Not applicable
Progress Report 1	• Email follow-up distributed in January 2023.	Yes	Not applicable	Not applicable
Progress Report 2	• Draft progress report distributed to Indigenous communities for review (November 27, 2023).	Yes	Not applicable	Not applicable
Progress Report 2	• Email follow-up to request re-download of draft progress report (November 29, 2023).	Yes	Not applicable	Not applicable
Progress Report 3	• Draft progress report distributed to Indigenous communities for review (November 28, 2024).	Yes	Not applicable	Not applicable
Progress Report 3	• Email follow-up distributed in December 2024 and January 2025.	Yes	Not applicable	Not applicable
Draft Environmental Assessment / Impact Statement	• Release of the Draft Environmental Assessment / Impact Statement to Indigenous communities (February 18, 2025).	Yes	Not applicable	Not applicable
Draft Environmental Assessment / Impact Statement	• Email notification of the release of the Draft Environmental Assessment / Impact Statement to Indigenous communities (February 19, 2025).	Yes	Not applicable	Not applicable
Draft Environmental Assessment / Impact Statement	• Release of the Community Well-Being Report to Indigenous communities and email notification (April 10, 2025).	Yes	Not applicable	Not applicable
Draft Environmental Assessment / Impact Statement	• The Assessment Summary for the Draft Environmental Assessment / Impact Statement was distributed to Indigenous communities via Canada Post registered mail (February 19, 2025).	Yes	Not applicable	Not applicable
Draft Environmental Assessment / Impact Statement	• Notice of publication of the Draft Environmental Assessment / Impact Statement (April 22, 2025).	Yes	Yes	Yes
Draft Environmental Assessment / Impact Statement	• Release of the Draft Environmental Assessment / Impact Statement to interested persons and government agencies (April 22, 2025).	Yes	Yes	Yes
Draft Environmental Assessment / Impact Statement	• The Assessment Summary for the Draft Environmental Assessment / Impact Statement was made available online and at designated library locations (announcement made April 22, 2025).	Yes	Yes	Yes
Draft Environmental Assessment / Impact Statement	• Email follow-up reminder to provide feedback on the Draft Environmental Assessment / Impact Statement (June 19, 2025).	Yes	Yes	Yes
Aboriginal and / or Treaty Rights and Interests: Draft Impact Assessment Reports	• Release of community-specific Aboriginal and / or Treaty Rights and Interests: Draft Impact Assessment Reports (various dates between June and July 25).	Yes	Not applicable	Not applicable
Public Information Centres	• Public Information Centre #3 Notice distributed (June 13, 2022).	Yes	Yes	Yes
Public Information Centres	• Public Information Centre #3 in Thunder Bay (June 27, 2022).	Yes	Yes	Yes
Public Information Centres	• Public Information Centre #3 in Geraldton (June 29, 2022).	Yes	Yes	Yes
Public Information Centres	• Public Information Centre #4 Notice distributed (November 22, 2022).	Yes	Yes	Yes
Public Information Centres	• Public Information Centre #4 in Thunder Bay (December 7, 2022).	Yes	Yes	Yes
Public Information Centres	• Public Information Centre #4 in Geraldton (December 8, 2022).	Yes	Yes	Yes
Public Information Centres	• Public Information Centre #5 Notice distributed (October 10, 2023).	Yes	Yes	Yes
Public Information Centres	• Public Information Centre #5 in Thunder Bay (October 25, 2023).	Yes	Yes	Yes
Public Information Centres	• Public Information Centre #5 in Geraldton (October 26, 2023).	Yes	Yes	Yes
Public Information Centres	• Public Information Centre #6 Notice distributed (April 21, 2025).	Yes	Yes	Yes
Public Information Centres	• Public Information Centre #6 in Thunder Bay (May 26, 2025).	Yes	Yes	Yes
Public Information Centres	• Public Information Centre #6 in Geraldton (May 29, 2025).	Yes	Yes	Yes
Provincially-Supported Forums	• Aboriginal and / or Treaty Rights and Interests Forum #1 in Thunder Bay (February 8 and 9, 2023).	Yes	Not applicable	Yes
Provincially-Supported Forums	• Aboriginal and / or Treaty Rights and Interests Forum #2 in Thunder Bay (November 21 to 23, 2023).	Yes	Not applicable	Yes

Activity	Description	Indigenous Communities	Interested Persons	Government Agencies
Provincially-Supported Forums	• Three-Road Project Gathering and Expo in Thunder Bay (June 11 to June 13, 2024).	Yes	Not applicable	Yes
Provincially-Supported Forums	• Three-Road Project Gathering and Expo in Thunder Bay (February 19 to February 20, 2025).	Yes	Not Applicable	Yes
Provincially-Supported Forums	• Three-Road Project Gathering and Expo in Timmins (February 25 to February 26, 2025).	Yes	Not Applicable	Yes
Individual Community Access Road Meetings	• In-person meeting with Marten Falls First Nation to provide an update on the Community Access Road and the approval of the Terms of Reference (November 16 and 17, 2021).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• In-person presentation to the Mushkegowuk Council Annual General Meeting (November 24, 2021).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• Teleconference with Marten Falls First Nation to discuss the Assessment Process (February 2, 2022).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• Teleconference with Métis Nation of Ontario to discuss the Indigenous Knowledge Program (February 4, 2022). • **Note:** also captured under the Indigenous Knowledge Program section below.	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• Teleconference with Constance Lake First Nation (April 21, 2022). • **Note:** also captured under the Indigenous Knowledge Program and Community Coordinator Program sections below.	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• Teleconference presentation to Mushkegowuk Tribal Council's Terrestrial Working Group (May 18, 2022).	Yes	Yes	Not applicable
Individual Community Access Road Meetings	• Teleconference with Marten Falls First Nation Senior Community Member Advisor to discuss and collect feedback on the upcoming Bird Field Program (May 31, 2022).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• In-person meeting with Marten Falls First Nation in advance of Public Information Centre #3 (June 28, 2022).	Yes	Yes	Not applicable
Individual Community Access Road Meetings	• Virtual meeting with Ginoogaming First Nation to discuss the Indigenous Knowledge Program and the Community Coordinator Program (July 5, 2022).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• In-person meeting with Long Lake #58 regarding Community Coordinator and Indigenous Knowledge Programs (August 9, 2022).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• In-person meeting with Marten Falls First Nation in advance of Public Information Centre #4 (November 2, 2022).	Yes	Yes	Not applicable
Individual Community Access Road Meetings	• In-person meeting with Marten Falls First Nation in advance of Public Information Centre #4 (December 6, 2022).	Yes	Yes	Not applicable
Individual Community Access Road Meetings	• In-person Council-to-Council meeting with Marten Falls First Nation and Aroland First Nation in Thunder Bay. Meeting minutes were not taken (January 26, 2023).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• Teleconference with Long Lake #58 First Nation to discuss the Community Coordinator Program and Indigenous Knowledge Program (February 13, 2023).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• Virtual meeting with Ginoogaming First Nation to discuss the Indigenous Knowledge Program and the Community Coordinator Program (March 27, 2023).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• Virtual meeting with Long Lake #58 First Nation, Constance Lake First Nation and Ginoogaming First Nation to discuss the Archaeology and Cultural Heritage reports (April 21, 2023).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• Teleconference with Métis Nation of Ontario to discuss Archaeology and Cultural Heritage Program (April 27, 2023).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• In-person Council-to-Council meeting with Eabametoong First Nation to provide an overview of the Community Access Road (May 10, 2023).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• Virtual meeting with Marten Falls First Nation was held regarding the engineering, construction and the route selection process for the Community Access Road (May 15, 2023).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• Virtual meeting with Long Lake #58 First Nation's legal counsel to discuss the Indigenous Knowledge Sharing Agreement (May 17, 2023).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• Virtual meeting with Long Lake #58 First Nation was held to provide a Community Access Road overview (August 29, 2023).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• In-person meeting with Marten Falls First Nation in advance of Public Information Centre #5 (October 23, 2023).	Yes	Yes	Not applicable
Individual Community Access Road Meetings	• In-person meeting with Marten Falls First Nation in advance of Public Information Centre #5 (October 24, 2023).	Yes	Yes	Not applicable
Individual Community Access Road Meetings	• In-person meeting with Long Lake #58 First Nation Elders to discuss general updates for the Community Access Road (October 26, 2023).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• Virtual meeting with Long Lake #58 First Nation was held as a follow-up to discuss the Community Coordinator and Indigenous Knowledge Programs meeting (November 10, 2023).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• Virtual meeting held with Attawapiskat First Nation representatives to discuss the Community Access Road and Caribou Study Plan (December 4, 2023).	Yes	Not applicable	Not applicable

Activity	Description	Indigenous Communities	Interested Persons	Government Agencies
Individual Community Access Road Meetings	• In-person meeting with Nibinamik First Nation to provide a Community Access Road update (January 16, 2024).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• Virtual meeting with Red Sky Métis Independent Nation to review the Draft Aboriginal and / or Treaty Rights and Interests Existing Conditions Report (March 19, 2024).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• In-person Council-to-Council meeting with Aroland First Nation to build on and improve the relationship between the two nations and to provide both nations the opportunity to discuss any concerns or issues, including the previously drafted Communication Protocol Agreement (April 19, 2024).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• In-person taskforce meeting between Marten Falls First Nation and Aroland First Nation (May 7, 2024). • **Note:** in April 2024, a taskforce was created between Marten Falls First Nation and Aroland First Nation to discuss various topics, including advancing discussions related to the Community Access Road and other road projects, as well as collaboration between the nations. Several taskforce meetings have occurred between the two communities; however, they are not specific to the Community Access Road and fall outside of the scope of this Environmental Assessment / Impact Statement.	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• In-person taskforce meeting between Marten Falls First Nation and Aroland First Nation (May 28, 2024).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• In-person Chief and Council meeting with Marten Falls First Nation to provide a Community Access Road update (May 29, 2024).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• Virtual meeting with Attawapiskat First Nation to discuss the spring Groundwater Program (May 31, 2024).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• In-person taskforce meeting between Marten Falls First Nation and Aroland First Nation (June 5, 2024).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• Virtual meeting with Weenusk First Nation to provide a Community Access Road update and discuss the Indigenous Knowledge Program and community well-being (social and economic) programs (June 5, 2024).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• In-person meetings with Aroland First Nation community members to obtain feedback on the Preferred Route recommendation, existing conditions, and cumulative effects, including Project Inclusions List (June 19 and 20, 2024).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• In-person meeting with Long Lake #58 First Nation Elders and community members to present the preliminary technically preferred route (June 20, 2024).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• Virtual meeting with Ginoogaming First Nation to discuss the Archaeology Assessment Report, Community Coordinator Program and upcoming engagement opportunities (July 10, 2024).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• In-person taskforce meeting between Marten Falls First Nation and Aroland First Nation (July 11, 2024).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• In-person meetings with Aroland First Nation community members to obtain feedback on the Preferred Route recommendation including Segment 1, Dusey Lake, Segment 2, Segment 3, cumulative effects, evaluation approach and Project Inclusions List, engineering considerations, and existing conditions (valued component studies) (July 15 and 16, 2024).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• In-person meetings with Marten Falls First Nation members to confirm selection of the Preferred Route selection, cumulative effects, evaluation approach and Project Inclusions List, engineering considerations, and existing conditions (valued component studies) (July 17 and 18, 2024).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• Virtual meeting held with Attawapiskat First Nation to discuss the Draft Aboriginal and / or Treaty Rights and Interests Existing Conditions Report (July 23, 2024).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• Virtual meeting held with Ginoogaming First Nation to discuss the Stage 1 Archaeological Report (August 1, 2024).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• In-person taskforce meeting between Marten Falls First Nation and Aroland First Nation (August 8, 2024).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• Virtual meeting held with Animbiigoo Zaagi'igan Anishinaabek to discuss the Indigenous Knowledge Program (August 28, 2024).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• In-person meeting with Marten Falls First Nation to discuss Preferred Route selection, the Draft Environmental Assessment / Impact Statement, construction and design details, potential effects and mitigations, socio-economics, climate change adaptation, and offsetting (October 15, 2024).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• Virtual meeting with a professor from Laurentian University, who provided a presentation on climate change (October 24, 2024).	Not applicable	Yes	Not applicable
Individual Community Access Road Meetings	• In-person taskforce meeting between Marten Falls First Nation and Aroland First Nation (October 29, 2024).	Yes	Not applicable	Not applicable

Activity	Description	Indigenous Communities	Interested Persons	Government Agencies
Individual Community Access Road Meetings	• Virtual meeting held with Fort Albany First Nation to discuss Community Access Road updates and meaningful consultation and engagement (November 7, 2024).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• Virtually attended the Geraldton Area Natural Resources Advisory Committee fall general meeting to deliver a presentation on the Community Access Road (November 20, 2024).	Not applicable	Yes	Not applicable
Individual Community Access Road Meetings	• Virtual meeting held with Long Lake #58 First Nation to discuss the Indigenous Knowledge Program and the community's Indigenous Knowledge collection study (February 6, 2025).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• In-person meetings with Marten Falls First Nation to present the Draft Environmental Assessment / Impact Statement and discuss the Draft Environmental Assessment / Impact Statement content (February 12 and 19, 2025).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• In-person meetings at the Three-Road Project Gathering and Expo with representatives from Animbiigoo Zaagi'igan Anishinaabek, Aroland First Nation, Attawapiskat First Nation, Constance Lake First Nation, Fort Albany First Nation, Long Lake #58 First Nation, Kashechewan First Nation, Mushkegowuk Tribal Council, Nibinamik First Nation and Red Sky Métis Independent Nation (February 19 to 25, 2025).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• In-person meeting with Constance Lake First Nation community members to provide a Community Access Road overview and present the Draft Environmental Assessment / Impact Statement (February 22, 2025).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• Attended the Prospectors & Developers Association of Canada Conference in-person to deliver two presentations and host an information booth (March 2 to 3, 2025).	Not applicable	Yes	Not applicable
Individual Community Access Road Meetings	• Virtual meeting with Matawa First Nations Management to discuss the Community Well-Being Report (May 9, 2025).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• In-person meeting with Marten Falls First Nation to discuss the Draft Environmental Assessment / Impact Statement content including community well-being and cumulative effects (May 27 and 28, 2025).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• In-person meeting with Aroland First Nation community members to discuss the Draft Environmental Assessment / Impact Statement content including community well-being and cumulative effects (May 28 and 29, 2025).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• Virtual meeting with Fort Albany First Nation to discuss the community's ongoing review of the Draft Environmental Assessment / Impact Statement (June 3, 2025).	Yes	Not applicable	Not applicable
Individual Community Access Road Meetings	• The Project Team's attendance at in-person general meeting for Marten Falls First Nation in Thunder Bay (July 4, 2025).	Yes	Not applicable	Not applicable
Field Program Involvement	• Helicopter flyover to visually inspect three potential groundwater sites with Aroland First Nation (August 17 and 18, 2022).	Yes	Not applicable	Not applicable
Field Program Involvement	• Well drilling activities monitored by Aroland First Nation representatives (November 25 to December 3, 2022).	Yes	Not applicable	Not applicable
Field Program Involvement	• Helicopter flyover to inform the Geotechnical Program with Marten Falls First Nation and Aroland First Nation (July 19 and 20, 2024).	Yes	Not applicable	Not applicable
Other Notices / Newsletters	• 2021 Highlights Letter distributed to Indigenous communities via email (December 15, 2021).	Yes	Not applicable	Not applicable
Other Notices / Newsletters	• Phone calls to Indigenous communities to follow-up on the December e-blast, Winter Discussion Guide, and field notice (December 16 and 17, 2021).	Yes	Not applicable	Not applicable
Monthly E-Blasts	• Circulated Monthly Community Access Road Update E-blast: – October 2021 (November 3, 2021); – November 2021 (November 30, 2021); – December 2021 (December 15, 2021); – January 2022 (January 31, 2022); – February / March 2022 (March 15, 2022); – April 2022 (April 29, 2022); – May 2022 (May 27, 2022); – June 2022 (June 24, 2022); – July 2022 (July 26, 2022); – August 2022 (August 19, 2022); – September 2022 (September 29, 2022); – October 2022 (November 2, 2022); – November 2022 (November 25, 2022);	Yes	Yes	Yes

Activity	Description	Indigenous Communities	Interested Persons	Government Agencies
	– December 2022 (December 20, 2022); – January 2023 (January 30, 2023); – February 2023 (February 28, 2023); – March 2023 (April 4, 2023); – April 2023 (April 28, 2023); – May 2023 (June 7, 2023); – June 2023 (June 28, 2023); – July 2023 (August 2, 2023); – August 2023 (September 1, 2023); – September 2023 (September 28, 2023); – October 2023 (November 2, 2023); – 2023 Year in Review (December 12, 2023); – January 2024 (January 31, 2024); – February 2024 (March 1, 2024); – March 2024 (April 3, 2024); – April 2024 (April 30, 2024); – May 2024 (May 30, 2024); – June 2024 (July 9, 2024); – July 2024 (August 1, 2024); – August 2024 (September 4, 2024); – September 2024 (October 3, 2024); – October 2024 (November 5, 2024); – 2024 Year In Review (December 18, 2024); – January 2025 (February 10, 2025); – February 2025 (March 4, 2025); – March 2025 (April 3, 2025); – April 2025 (May 8, 2025); – May 2025 (June 11, 2025); – June 2025 (July 15, 2025); and – July 2025 (August 7, 2025).			
Field Program Notices and Discussion Guides	• Circulated field program notices and discussion guides: – Winter Field Program Notice and Discussion Guide (December 10, 2021); – Furbearer Ground Track Survey Update (January 19, 2022); – Bird Aerial Surveys Update (February 4, 2022); – Wolverine Den Surveys Notice (February 14, 2022); – Wolverine Hair Snag Program and Bird Autonomous Recording Unit Update (March 3, 2022); – Wolverine Den Survey Update (March 9, 2022); – Early Spring Notice (March 29, 2022); – Terrain and Soils Notice (May 11, 2022); – Surface Water, Fish and Fish Habitat Notice (May 30, 2022); – Vegetation Field Notice (June 10, 2022); – Groundwater and Geochemistry (July 29, 2022); – Fall Field Programs Update (September 16, 2022); – Winter / Spring 2023 Field Notice (December 1, 2022); – Follow-up to furbearer winter tracking field program notice (January 27, 2023); – Follow-up on ungulate aerial survey notice (February 15, 2023); – Field Programs updates (March 9, 2023);	Yes	Yes	Yes

Activity	Description	Indigenous Communities	Interested Persons	Government Agencies
	– Spring 2023 Field Notice (April 21, 2023); – Summer 2023 Field Notice (July 12, 2023); – Fall 2023 Field Notice (September 15, 2023); – Winter 2024 Field Notice (January 18, 2024); – Spring 2024 Field Notice (April 17, 2024); – Spring Groundwater Program Update (May 23, 2024); – Summer 2024 Field Notice (July 16, 2024); – Fall Groundwater and Geochemistry Program Update (September 18, 2024); – Winter Field Notice (January 15, 2025); – Summer / Fall 2025 Field Notice (Jul 16, 2025); and – Field Work Update - Stage 2 Archaeological Assessment (July 31, 2025).			
Other	• Matawa Messenger newsletter feature (June 2022).	Yes	Yes	Yes
Webinars	• Webinar Series: – Animals and Wildlife (Ungulates and Furbearers) (November 15, 2022); – Surface Water, Fish and Fish Habitat (November 29, 2022); – Archaeology and Cultural Heritage (January 10, 2023); – Vegetation and Physiography (January 17, 2023); – Peatlands (January 31, 2023); – Air Quality, Greenhouse Gases and Climate Change (February 14, 2023); – Socio-Economic Studies Part I (February 21, 2023); – Socio-Economic Studies Part II (February 28, 2023); – Groundwater and Geochemistry (March 14, 2023) – Birds (March 21, 2023); – Reptiles, Amphibians, Insects, and Bats (March 28, 2023); – Aboriginal and / or Treaty Rights and Interests (April 4, 2023); – Route Selection Milestone (November 16, 2023); – Climate Change Webinar (February 8, 2024) and post-webinar survey (February 8, 2024, and March 1, 2024); – Building the Community Access Road Webinar (November 20 and November 26, 2024); – Community Well-Being Webinar (April 30 and May 6, 2025); – Land: Ungulates (Moose and Caribou) Webinar (April 30 and May 6, 2025); – Water: Fish & Fish Habitat Webinar (April 30, May 6 and May 20, 2025); and – People: Land and Resource Use Webinar (April 30, May 6, May 20 and June 5, 2025).	Yes	Yes	Yes
Archaeological Assessment Reports	• Stage 1 and Stage 2 Archaeological Assessment Report (February 3, 2023).	Yes	Not applicable	Not applicable
Archaeological Assessment Reports	• Stage 1 Archaeological Assessment Report (June 3, 2024).	Yes	Not applicable	Not applicable
Indigenous Knowledge Program	• Circulated an update on the Indigenous Knowledge Program which included an updated schedule and timeline for Indigenous communities to share Indigenous Knowledge (January 21 to 24, 2022).	Yes	Not applicable	Not applicable
Indigenous Knowledge Program	• Teleconference with Métis Nation of Ontario to discuss the Indigenous Knowledge Program (February 4, 2022).	Yes	Not applicable	Not applicable
Indigenous Knowledge Program	• Teleconference with Constance Lake First Nation to discuss the Indigenous Knowledge Program (and Community Coordinator Program) (April 21, 2022).	Yes	Not applicable	Not applicable
Indigenous Knowledge Program	• Indigenous Knowledge Program Update on the Proposed Aboriginal and / or Treaty Rights and Interests Study Areas Memo and Aboriginal and / or Treaty Rights and Interests Shapefiles were distributed via email. (August 2022).	Yes	Not applicable	Not applicable
Indigenous Knowledge Program	• Distributed a Save the Date for the upcoming Aboriginal and / or Treaty Rights and Interests Forum and Cultural Heritage Workshop via email (December 20, 2022).	Yes	Not applicable	Not applicable
Indigenous Knowledge Program	• Invitation to Aboriginal and / or Treaty Rights and Interests Forum distributed (January 13, 2023, and February 1, 2023).	Yes	Not applicable	Not applicable
Indigenous Knowledge Program	• Cultural Heritage Workshop in Thunder Bay at the Aboriginal and / or Treaty Rights and Interests Forum (February 8 and 9, 2023).	Yes	Not applicable	Not applicable
Indigenous Knowledge Program	• Indigenous Knowledge Program timeline and update letter (March 22, 2023).	Yes	Not applicable	Not applicable

Activity	Description	Indigenous Communities	Interested Persons	Government Agencies
Indigenous Knowledge Program	• Indigenous Knowledge Program timeline and update letter (June 22, 2023).	Yes	Not applicable	Not applicable
Indigenous Knowledge Program	• Indigenous Knowledge Program timeline and update letter (October 5, 2023).	Yes	Not applicable	Not applicable
Indigenous Knowledge Program	• Indigenous Knowledge Program timeline and update letter (November 10, 2023).	Yes	Not applicable	Not applicable
Indigenous Knowledge Program	• Draft Preliminary Aboriginal and / or Treaty Rights and Interests Existing Conditions Report distributed via email to Indigenous communities (November 28, 2023).	Yes	Not applicable	Not applicable
Indigenous Knowledge Program	• Distribution of community-specific Aboriginal and / or Treaty Rights and Interests: Draft Impact Assessment Reports (June 10 to July 11, 2025).	Yes	Not applicable	Not applicable
Indigenous Knowledge Program	• Ongoing monthly outreach regarding participation in the Indigenous Knowledge Program.	Yes	Not applicable	Not applicable
Community Coordinator Program	• Distribution of letter introducing the Community Coordinator Program to 13 neighbouring Indigenous communities including job posting (March 17, 2022).	Yes	Not applicable	Not applicable
Community Coordinator Program	• Teleconference with Constance Lake First Nation to discuss the Community Coordinator Program (and the Indigenous Knowledge Program) (April 21, 2022).	Yes	Not applicable	Not applicable
Community Coordinator Program	• Ongoing monthly outreach regarding participation in the Community Coordinator Program.	Yes	Not applicable	Not applicable
Community Capacity Funding Program	• Information on the Community Capacity Funding Program sent to 15 Indigenous communities via email (October 30 to November 13, 2024).	Yes	Not applicable	Not applicable

11.7.2 Consultation and Engagement with Indigenous Communities

11.7.2.1 Marten Falls First Nation

During the preparation of the Terms of Reference and leading up to the Notice Commencement of Environmental Assessment community, meetings were designed to gather input from members and receive direction from Chief and Council.

Table 11-8 summarizes the meetings held with Marten Falls First Nation during the Assessment Process to provide updates on the Community Access Road and receive feedback. The meetings were open to all Community members and held either in Marten Falls or outside of the Community (virtual, Thunder Bay or Geraldton), up to the release of the Final Environmental Assessment / Impact Statement.

Table 11-8: Summary of Meetings with Marten Falls First Nation

Milestone	Date	Purpose	In-person / Virtual	Topics Discussed
Milestone 1	November 16 and 17, 2021	Introduction of Assessment Process and Youth Engagement Program	In-person	• This meeting provided an update on the Community Access Road and shared that the Terms of Reference for the Project had been approved. Discussions included: – Provincial environmental assessment process and schedule; – Upcoming field programs and support staff opportunities; – Indigenous Knowledge Program; and – Youth Engagement Program was delivered as part of the meeting.
Milestone 1	February 2, 2022	Community Update	Virtual	• This meeting provided an update on the Community Access Road and discussed the Assessment Process as a whole. Discussions included: – Refresher on the Community Access Road; – Update on the schedule; – Information on the environmental assessment process; – Information on the Assessment Process; – Review of questions and answers from the last community meeting; – Overview of field programs and support staff job opportunities; and – Update on the Indigenous Knowledge Program.
Milestone 2	June 28, 2022	Community Update	In-person	• This meeting featured a combination of community-specific materials and a preview of the materials to be presented at Public Information Centre #3. Discussions included: – Refresher on the Community Access Road; why it is needed and new information since the last community meeting; – Sample photographs of what the road and / or bridges could look like; – Preliminary footprint of the Community Access Road; – Guiding principles for the Assessment Process and an overview of the process; – Alternative routes, evaluation criteria, and new information on aggregate sites; – Field programs and early observations; – Considerations for land and resource use and community well-being (social, economics, and human health); – Overview of the Indigenous Knowledge Program and Indigenous land and resource use, including Marten Falls First Nation's participated to date and next steps; – Assessment of Aboriginal and / or Treaty Rights and Interests; – Advertising the Community Coordinator position and application information; – Summary of consultation, engagement, and communication efforts to date, as well as future plans; – Feedback from the last community meeting and responses provided; and – 6-month look-ahead.
Milestone 2	Marten Falls First Nation (November 2, 2022) Thunder Bay Meeting (December 6, 2022)	Community update	In-person	• This meeting featured a combination of community-specific materials and a preview of the materials to be presented at Public Information Centre #4. Discussions included: – How a route to Marten Falls will be selected; – What has been learned through field programs conducted so far; – What Marten Falls First Nation has accomplished so far through the Indigenous Knowledge Program and Indigenous Lands and Resource Use information; – Introduction to the Marten Falls First Nation Community Coordinator (living in Marten Falls); – Job opportunities; – Feedback from the last community meeting and responses provided; – Plans for the Youth Engagement Program; and – 6-month look-ahead. • The Thunder Bay meeting also included: – Introduction to a second Community Coordinator (living outside of Marten Falls); and – Feedback from the last community meeting and responses provided.

Milestone	Date	Purpose	In-person / Virtual	Topics Discussed
• **Milestone 2**	• May 15, 2023	• Engineering, Design, and Construction: Chief and Council	• Virtual	• This meeting included a presentation and discussion on the engineering, design, and construction details of the Community Access Road.
Milestone 3	Thunder Bay Meeting (October 23, 2023) In-Community Meeting (October 24, 2023)	Community Update: Marten Falls First Nation Members	In-person	• This meeting included a combination of community-specific materials and a preview of the materials to be presented at Public Information Centre #5. Discussions included: – How the Community Access Road differs from the Northern Road Link and Webequie Supply Road projects; – Information on the Assessment Process; – Steps leading to road construction; – Feedback from the last community meeting, the Aboriginal and / or Treaty Rights and Interests Forum, and the Archaeology and Cultural Heritage Workshop and responses provided; – Updates on the Indigenous Knowledge Program; – Existing conditions results for completed studies; – Route selection methods, including the pros and cons of proposed routes (alternatives), how the Preferred Route will be selected, and a preliminary technically preferred route recommendation; – Cumulative effects and the Project Inclusions List; – Overview of community well-being surveys, intended to collect social, economics, and human health information; and – 6-month look-ahead.
Milestone 3	Marten Falls First Nation (May 29, 2024)	Route Alignment	In-person	• This meeting provided a Project overview to Marten Falls First Nation Chief and Council, including an update on the changes to the technically preferred route recommendation. Discussions included: – Updated route; – Overview of existing conditions; – Details of the Assessment Process and engagement efforts; – Information on the Community Coordinator Program; and – Upcoming engagement opportunities, including the Three-Road Project Gathering and Expo.
Milestone 3	Marten Falls First Nation (July 17, 2024) Thunder Bay (July 18, 2024)	Preferred Route Recommendation	In-person	• This meeting focused on reaching a major Project milestone – approving the Preferred Route Recommendation and other Project Updates. Discussions included: – Changes to the Preferred Route recommendation based on consultation and engagement; – Updates on the Band Council Resolution (signed by Chief and Council in August 2024); – Cumulative effects assessment and the Project Inclusions List; and – Updates regarding field programs and Assessment Process.
Milestone 4	Thunder Bay Meeting (October 15, 2024) Marten Falls First Nation (October 17, 2024)	Preferred Route Selection	In-person	• This meeting offered a chance for community members to learn about the Assessment Process and review new information related to various study areas. Discussions included: – Preferred Route including how community feedback played a role in its refinement; and – New information on the Draft Environmental Assessment / Impact Statement review process, construction, socio-community studies, potential effects and mitigation measures, offsetting activities, cumulative effects, and climate change challenges. • The Marten Falls First Nation in-community meeting scheduled for October 17, 2024, was cancelled due to unforeseen circumstances in the Community.
Milestone 4	Marten Falls First Nation (February 12, 2025) Thunder Bay (February 19, 2025)	Draft Environmental Assessment / Impact Statement Release	In-person	• The Draft Environmental Assessment / Impact Statement was delivered for Community members' early viewing (hard copy and digital files). This provided an opportunity to discuss and ask questions about the draft documents and next steps. The in-community session held was structured as an open house / drop-in and the Thunder Bay session provided a presentation and open discussion period. Discussions included: – Preferred Route and questions around construction and designs; Assessment Process schedule and when construction is expected to begin; – How feedback from other Indigenous Communities had on the Community Access Roa; and – In addition to the full Draft Environmental Assessment / Impact Statement, Assessment Summary Packages were shared with Community members, which included plain language summaries to support their review.

Milestone	Date	Purpose	In-person / Virtual	Topics Discussed
Milestone 4	Marten Falls First Nation (May 27, 2025) Thunder Bay (May 28, 2025)	Draft Environmental Assessment / Impact Statement Review	In-person	• This meeting included a combination of community-specific materials and materials to be presented at Public Information Centre #6. Discussions included: – Purpose of the Draft Environmental Assessment / Impact Statement; – What was heard on the Draft Environmental Assessment / Impact Statement; – How the Community Access Road will affect community well-being for Marten Falls and nearby communities and the opportunity to participate in a Story Beads exercise, and Country Foods Program; – Cumulative Effects Assessment process and updated Project Inclusions List; – Land and Resource Use; – Opportunity to participate in a bridge / culverts navigability exercise; and – How to provide feedback on the Draft Environmental Assessment / Impact Statement and upcoming activities.
Milestone 4	Thunder Bay (July 4, 2025)	Marten Falls First Nation General Meeting	In-person	• Marten Falls First Nation invited a member of the Project Team to present on the Community Access Road. Discussions included: – Assessment Process and Environmental Assessment / Impact Statement schedule; – Feedback received during the Draft Environmental Assessment / Impact Statement; – Consultation and engagement activities that occurred during the Draft Environmental Assessment / Impact Statement review period; and – Update on the Country Foods Program.

Marten Falls First Nation, as the Proponent and the community most directly affected, played a defining role in shaping the Final Environmental Assessment / Impact Statement. Their direction, feedback, and knowledge influenced both the process and outcomes in many ways:

- **Early review and direction on engagement materials** - as Proponent and a potentially affected community, Marten Falls First Nation reviewed and shaped presentations, discussion guides, webinars, and video content before these materials were shared with other communities, interested persons or government agencies, helping to ensure alignment with Community expectations and knowledge.
- **Influence on technical work** - feedback helped refine route alignment, assessment focus, and study parameters (for example, areas of concern, valued components), supporting adjustments reflected in the Final Environmental Assessment / Impact Statement.
- **Refinement of the Preferred Route** - input (through community meetings, technical discussions, and leadership reviews) directly contributed to refining the preliminary technically preferred route and confirming the Preferred Route. This culminated in a Band Council Resolution in August 2024, endorsing the Preferred Route.
- **Consent for the Final Environmental Assessment / Impact Statement Submission** - formal support was provided through a second Band Council Resolution, helping to ensure the submission reflects Community priorities and values.

11.7.2.2 Neighbouring Indigenous Communities

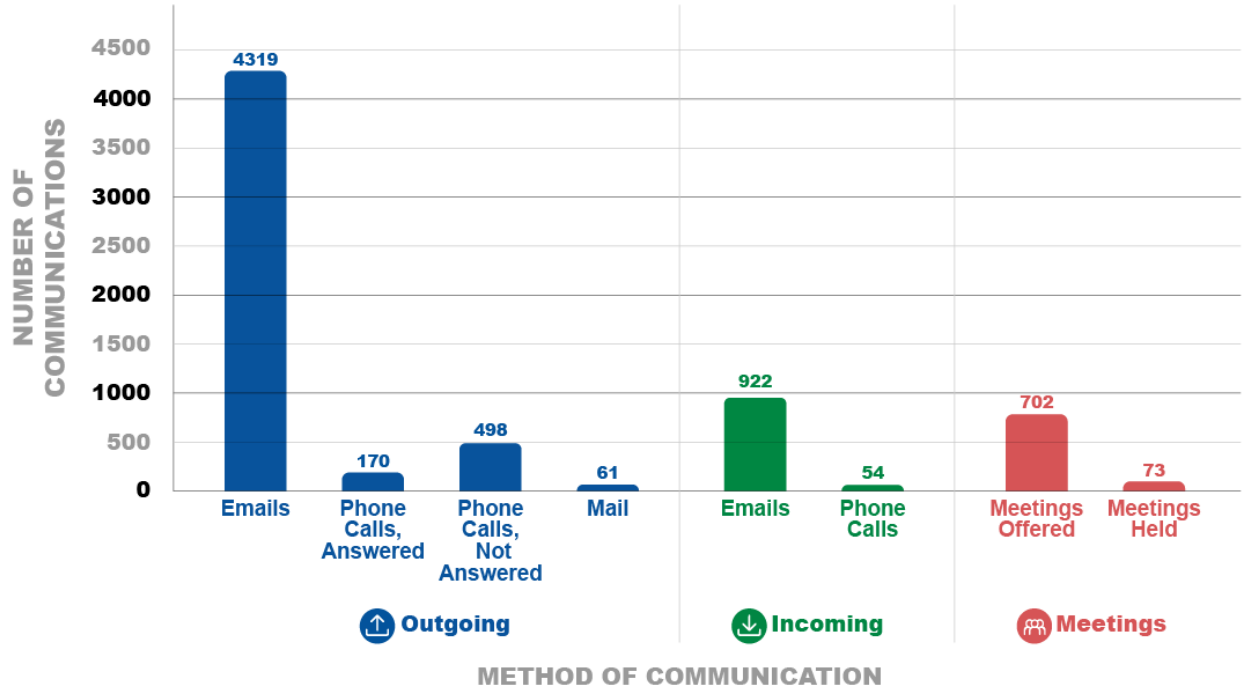
In addition to the broader consultation and engagement activities described in **Section 11.5**, the Project Team, throughout Milestones 1 to 4, carried out focused outreach and engagement efforts specifically with neighbouring Indigenous communities. This consultation and engagement provided essential insights into community priorities, land use, cultural values, and technical considerations, including potential sources of aggregate material. Through a combination of broad communications, meetings, field study discussions, Indigenous Knowledge sharing, funding-program engagement, community-specific conversations, and participation in provincially-supported forums, communities offered detailed feedback on environmental, cultural, socio-economic, and rights-related topics. This input helped shape a clear understanding of community interests and concerns throughout the Assessment Process.

Results of consultation and engagement with neighbouring Indigenous communities is summarized in **Section 11.7.2.2.11** and described in more detail in the Record of Consultation and Engagement for Indigenous Communities in **Appendix X**.

11.7.2.2.1 Email and Phone Outreach

The Project Team maintained consistent communication with neighbouring Indigenous communities through email and telephone outreach. Between 2021 and 2025, over 4,300 emails were issued, supported by extensive phone outreach, as part of nearly 4,500 total contact attempts (**Figure 11-3**). These communications provided monthly updates, milestone notifications, and circulation of key documents, including the Milestone Progress Reports, the Existing Conditions Report, the Community Well-Being Technical Support Document (**Appendix T**), Stage 1 and 2 Archaeological Assessment Reports, the community-specific Aboriginal and / or Treaty Rights and Interests: Draft Impact Assessment Reports and the Draft Environmental Assessment / Impact Statement, released in early 2025.

Figure 11-3: Summary of Communication with Indigenous Communities throughout the Assessment Process



Emails and calls also shared: updates on the Indigenous Knowledge Program; information about the transition from the Community Coordinator Program to the Community Capacity Funding Program in late 2024 (including continuous follow-up to

encourage participation); and seasonal notices about ongoing field studies. Invitations were also issued for Public Information Centres, Aboriginal and / or Treaty Rights and Interests Forums (two), Three Roads Gathering and Expo events (two), webinars, and community meetings. Additional community-specific outreach responded to questions, clarified funding details, requested interest in scheduling meetings with the Project Team, addressed feedback on technical documentation, and supported the submission of Indigenous Knowledge.

11.7.2.2.2 Meeting and Discussions

Meetings with neighbouring Indigenous communities occurred throughout all milestones and were held in the Marten Falls First Nation community, Thunder Bay, Geraldton, or virtually. Across all four milestones, the Project Team offered approximately 700 meetings and held 73 with neighbouring communities.

- **Milestone 1 (2022): 9 meetings with 4 communities** - Early discussions centred around: building Community Access Road awareness; funding questions related to the Indigenous Knowledge Program and Community Coordinator Program; opportunities to participate in field programs; Aboriginal and / or Treaty Rights and Interests; alternative routes; environmental concerns and climate change; COVID-19 effects on consultation and engagement; cumulative effects; community well-being (including access and safety concerns); and Public Information Centre #3.
- **Milestone 2 (2022–2023): 12 meetings with 7 communities** - Building on Milestone 1 topics, discussions expanded as communities reviewed early technical materials and provided more detailed feedback. New and / or deepened topics included: review of Progress Report 1 and the Draft Interim Record of Consultation and Engagement; Public Information Centre #4; feedback on field studies and continued interest in participation; comments related to Aboriginal and / or Treaty Rights and Interests; areas of interest and cultural heritage; environmental impacts to wildlife, vegetation, and water; more specific views on route alignments; consultation and engagement methods; socio-economic impacts; and concerns and comments related to Stage 1 and Stage 2 Archaeology Assessment Reports.
- **Milestone 3 (2023–2024): 25 meetings with 8 communities** - New or Milestone-specific topics discussed included engagement related to: Public Information Centre #5; the second Aboriginal and / or Treaty Rights and Interests Forum; Progress Reports 2 and 3; land use (hunting and fishing); areas of interest and cultural heritage; engineering considerations (bridges, crossings,

and routes); construction and operational topics (ownership, traffic, and maintenance); and community excitement about the Community Access Road, including interest related to job opportunities and improved access.

- **Milestone 4 (2025): 27 meetings with 13 communities** - New or Milestone-specific topics discussed included engagement related to: Public Information Centre #6; transition from the Community Coordinator Program to the Community Capacity Funding Program; more detailed feedback on engineering and construction (timelines, processes, and camps); expanded discussions on socio-economic conditions and human health; the Country Foods Program; and continued expressions of interest in job opportunities and improved access. Meetings also addressed community-specific Aboriginal and / or Treaty Rights and Interests in relation to the Draft Impact Assessment Reports and the Stage 1 Archaeological Assessment Report.

11.7.2.2.3 Milestone Progress Reports

Four additional consultation and engagement reports (Milestone Progress Reports) were provided to Indigenous communities for review and comment at the environmental assessment milestones described below. For more information about the Ministry of the Environment, Conservation and Parks requirements for Milestone Progress Reports, refer to **Section 11.2.2**.

- **Milestone 1: Notice of Commencement of Provincial Environmental Assessment** - sent to Indigenous communities on December 6, 2022. The reporting period covered October 29, 2021, to June 30, 2022, and focused on the introduction of the Community Access Road;
- **Milestone 2: Effects Assessment Methods** - sent to Indigenous communities on November 27 and 29, 2023. The reporting period covered July 1, 2022, to May 31, 2023, and focused on the development of the Effects Assessment methodology, including review by regulators and presentation of the Effects Assessment methodology at Public Information Centres. Indigenous communities were invited to share community values and topics of interest (including cumulative effects), and proposed impact management measures to avoid, mitigate, or offset effects;
- **Milestone 3: Identification of Preferred Alternatives** - sent to Indigenous communities on November 28 and 29, 2024. The reporting period covered June 1, 2023, to July 31, 2024, and supported engagement activities related to the identification of preferred alternatives. Input was obtained on alternative route options, proposed mitigation measures, and the environmental, socio-economic,

cultural, technical, and cost considerations used in route selection. Consultation during this milestone included a strong focus on the cumulative effects assessment methodology, including identification of projects and activities that could act cumulatively with the Community Access Road. The milestone concluded with the identification of a preliminary preferred alternative that involved validation of information from Marten Falls First Nation and other Indigenous communities. Confirmation of the Preferred Route was achieved through submission of the Final Route Recommendation Memo to Marten Falls First Nation Chief and Council, resulting in a Band Council Resolution for the Preferred Route; and

- **Milestone 4: Draft Environmental Assessment / Impact Statement** - sent to Indigenous communities on January 16, 2026. The reporting period covered August 1, 2024, to September 5, 2025, and focused on efforts related to the preparation and release of the Draft Environmental Assessment / Impact Statement in support of the Final Environmental Assessment / Impact Statement submission. Feedback was sought on the Draft document, proposed impact management, monitoring and adaptive management plans, cumulative effects assessment results, and draft conclusions. This milestone focused on consultation and engagement with Indigenous communities through the Indigenous Knowledge Program, Community Capacity Funding Program, community-specific Aboriginal and / or Treaty Rights and Interests: Draft Impact Assessment Reports, meetings, webinars, and Public Information Centre #6 to support understanding and encourage feedback during the Indigenous review period of the Draft Environmental Assessment / Impact Statement.

11.7.2.2.4 Field Studies Engagement

Field studies engagement was carried out throughout Milestones 1 to 4, providing early notice and opportunities for neighbouring Indigenous communities to participate in or provide input into the design and implementation of field programs. Seasonal field notices were issued during winter, spring, summer, and fall from 2022 to 2025, describing:

- Study purpose, timing, and locations;
- Disciplines such as wildlife, birds, fish and fish habitat, groundwater and geochemistry, vegetation, wetlands, peatlands, terrain, and archaeology;
- Field crews and equipment; and
- Opportunities for Indigenous communities to ask questions or identify sensitive areas.

Indigenous communities were regularly contacted regarding existing conditions studies and ongoing fieldwork, and many expressed interest in specific programs, particularly wildlife and archaeology. Input included observations of wildlife presence, habitat conditions, trapline areas, archaeological locations, and culturally sensitive use areas. Field monitors from Marten Falls First Nation and Aroland First Nation also participated in field programs.

During Milestone 3, Indigenous community input informed updates to study plans. For example, several communities provided comments about water crossings, caribou movement areas, or sensitive cultural landscapes that required additional attention.

In Milestone 4, supplementary fieldwork continued to support the Draft Environmental Assessment / Impact Statement, with ongoing communication to communities through emails, phone calls, and opportunities to ask questions about the purpose or timing of studies.

11.7.2.2.5 Community-Specific Engagement Activities

While all Indigenous communities received the same core opportunities, several neighbouring Indigenous communities engaged more deeply on specific topics. For example,

- Attawapiskat First Nation provided detailed input on Aboriginal and / or Treaty Rights and Interests materials that resulted in the expansion of the Regional Study Area for Attawapiskat First Nation's Aboriginal and / or Treaty Rights and Interests assessment;
- Animbiigoo Zaagi'igan Anishinaabek, Attawapiskat First Nation, Fort Albany First Nation, Long Lake #58 First Nation, and Red Sky Métis Independent Nation participated in meetings to discuss the Aboriginal and / or Treaty Rights and Interests Existing Conditions Report;
- Long Lake #58 First Nation, Constance Lake First Nation, Ginoogaming First Nation, and the Métis Nation of Ontario offered culturally relevant information regarding areas of archaeological importance through their review of the Stage 1 and Stage 2 Archaeological Assessment Reports; and
- Aroland First Nation participated in field monitoring programs and community-specific meetings in Milestones 3 and 4 and discussions through the Marten Falls First Nation and Aroland First Nation taskforce.

At the May 2025 community member meetings, Marten Falls First Nation and Aroland First Nation members participated in a Story Beads exercise to create a space for

intergenerational dialogue and shared storytelling, using beadwork as a metaphor. Participants were offered a variety of coloured beads, each representing a theme. Green represented land, blue water, yellow food, purple youth, red healing, black challenges, and white hope. Participants were asked to select three to five beads, string them onto a cord or safety pin, and share the story or memory behind their choices. Participants could share their story or memory through writing, drawing, or sharing verbally with a facilitator. Community members shared their hopes and concerns around the Community Access Road including increased access to food and reduced costs of living, along with concerns about outsider access, and substance abuse.

Some communities participated selectively based on internal capacity and priorities. Neskantaga First Nation ceased engagement in March 2023 following correspondence related to litigation with the Province of Ontario about environmental assessment consultation processes. While the Project Team continued to outreach and provide information, no further engagement occurred after March 29, 2023.

11.7.2.2.6 Indigenous Knowledge Program Engagement

Communications with Indigenous communities on the Indigenous Knowledge Program began in December 2019. Funding was offered to communities who expressed interest in the program starting in the summer of 2021 and continued beyond Milestone 4. Neighbouring Indigenous communities received regular communication about:

- How Indigenous Knowledge would be gathered, handled, and incorporated;
- Expectations for participation and confidentiality;
- Available tools and supports for sharing knowledge; and
- Coordination with field studies and valued component assessments.

The intent of the Indigenous Knowledge Program was to collaborate with interested Indigenous communities to explore how relevant knowledge could meaningfully inform the Assessment Processes as well as Project planning and design. Outreach efforts intensified during Milestone 3, a period in which Indigenous Knowledge was particularly important for identifying and assessing route alternatives. During this phase, Indigenous Knowledge could be considered alongside scientific and technical information to enhance understanding of existing conditions, inform the prediction of potential effects, and support the development of appropriate mitigation and monitoring measures. Indigenous Knowledge Program outreach continued during the Draft Environmental Assessment / Impact Statement review period, particularly as community-specific Aboriginal and / or Treaty Rights and Interests: Draft Impact Assessment Reports were circulated in June and July 2025.

At the time of the submission of the Final Environmental Assessment / Impact Statement, seven Indigenous communities had participated in the Indigenous Knowledge Program. Feedback provided on the Draft Environmental Assessment / Impact Statement indicated strong interest from several communities in sharing their Indigenous Knowledge, cultural perspectives, and traditions. Efforts to receive, understand, and integrate Indigenous Knowledge from interested communities will continue in detail design.

11.7.2.2.7 Community Coordinator / Community Capacity Funding Program

Funding-related engagement supported neighbouring Indigenous communities' participation across all milestones. The Community Coordinator Program was introduced in 2022 through email, phone outreach, and meetings. Communities received program information packages, job postings, and guidance on funding eligibility and reporting.

Throughout Milestones 1 to 3, the Project Team followed up with communities to confirm interest, support onboarding, and clarify how the program could be used for document review, meeting attendance, and internal coordination. Some Indigenous communities expressed interest in the program, however only Marten Falls First Nation took part in it.

In November 2024, the program evolved into the Community Capacity Funding Program. Communities were contacted to explain the new funding parameters, including how it will support review of the Draft Environmental Assessment / Impact Statement, and provide flexibility for internal review processes and engagement in meetings and webinars. This outreach continued beyond Milestone 4 as communities worked through the Draft Environmental Assessment / Impact Statement and community-specific Aboriginal and / or Treaty Rights and Interests reports. A total of nine Indigenous communities participated in the program and of those nine, eight provided feedback on the Draft Environmental Assessment / Impact Statement.

11.7.2.2.8 Provincially-Supported Forums

Forums have been a successful approach to consultation and engagement. These provincially-supported events offer a space for Indigenous communities to gather over several days to collect information and discuss the three road projects independently undergoing environmental assessments in the area: the Community Access Road, Webequie Supply Road, and Northern Road Link. Although the three road projects are distinct and in different phases of the environmental assessment, they are similarly regarded by neighbouring communities. Hosting an event forum on all three road

projects was an efficient way to engage Indigenous communities without the associated consultation fatigue.

- Two Aboriginal and / or Treaty Rights and Interests Forums were held in Thunder Bay on February 8 and 9, 2023, and November 21 to 23, 2023, respectively. The Province provided funding for 2 to 3 participants from each Indigenous community to attend the event in person. The two forums provided a private and inclusive space for representatives of Indigenous communities to meet with representatives from the Province and the Project Teams for the Community Access Road, Northern Road Link, and Webequie Supply Road;
- Two Three Roads Gathering and Expos were also held. One occurred in Thunder Bay from June 11 to 13, 2024, and a second occurred in Thunder Bay on February 19 and 20, 2025, and in Timmins on February 25 and 26, 2025. The Province funded up to three participants from each Indigenous community to attend the event in person. The forums were hosted by the company Indigenous Community and Engagement, with support from the Project Teams for the Community Access Road, Northern Road Link, and Webequie Supply Road. The expos provided a space where participants could learn more about the three unique road projects, ask questions, and share feedback;
- On the first day of the June 2024 Three-Road Gathering and Expo, Elders were invited to gather and engage with Project Teams for all three road projects to share their perspectives. The second and third days of the forum included: technical presentations on water, peatlands, and building roads on peatlands; an expo-style forum; and a half-day workshop to review the anticipated schedules for circulating the Draft Environmental Assessment / Impact Statement for the Community Access Road and the Webequie Supply Road. The goal was to inform participants about the proposed review process and seek clarifying questions in advance of the release of the Draft Environmental Assessment / Impact Statement; and
- The February 2025 Three-Road Gathering and Expo included presentations on the Community Access Road, Northern Road Link, and Webequie Supply Road. The 2 days included: an expo-style forum; and private breakout rooms for individual Indigenous communities to review the Community Access Road's Draft Environmental Assessment / Impact Statement, ask questions on the review process, and provide feedback. The Assessment Summary: Draft Environmental Assessment / Impact Statement was distributed to attendees and included a USB that contained the Draft Environmental Assessment / Impact Statement, technical supporting documents and plain language summaries.

11.7.2.2.9 Review Period of the Draft Environmental Assessment / Impact Statement

Preparation for the release began between September 24 and 26, 2024, when letters were issued to all 31 Indigenous communities, Tribal Councils, and Political Treaty Organizations / Provincial Territorial Organizations engaged on the Community Access Road. These letters advised recipients of the upcoming release, included a frequently asked questions document, and requested confirmation of key contacts and preferred formats for receiving the Draft Environmental Assessment / Impact Statement. In the months leading up to release, monthly E-blasts, videos, and social media posts shared information about the upcoming Draft Environmental Assessment / Impact Statement.

On February 12 and 19, 2025, printed copies of the Draft Environmental Assessment / Impact Statement and supporting documents were delivered to Marten Falls First Nation members in-community and in Thunder Bay. On February 19, 2025, Indigenous community key contacts received the Draft Environmental Assessment / Impact Statement link by email, along with links to supporting documents, including the Assessment Summary Package. Hard copies were sent to communities that requested them, and copies were also made available for viewing at multiple public locations and events.

Following the early release of the Draft Environmental Assessment / Impact Statement, the Project Team provided continued support through email, telephone outreach, and distribution of hard copies upon request. Additional communication occurred through monthly E-blasts, videos, website updates, and other information channels.

Throughout the review period, the Project Team offered meetings to assist communities in navigating the Draft Environmental Assessment / Impact Statement. Topic-specific webinars were delivered between April and June 2025, and community-specific meetings tied to Public Information Centre #6 were also offered. Indigenous communities could submit comments by email, phone, or mail until the extended deadline of September 5, 2025. More than 1,900 comments were received on the Draft Environmental Assessment / Impact Statement. Of these, over 1,000 comments were submitted by 9 Indigenous communities: Aroland First Nation, Animbiigoo Zaagi'igan Anishinaabek, Constance Lake First Nation, Fort Albany First Nation, Ginoogaming First Nation, Kashechewan First Nation, Mushkegowuk Council, Nibinamik First Nation, and Weenusk First Nation.

All comments and responses are included in the Feedback and Response Log (**Appendix C**), which documents each submission, the Project Team's response, and

whether changes were made to the Final Environmental Assessment / Impact Statement.

11.7.2.2.10 Community-Specific Aboriginal and / or Treaty Rights and Interests: Draft Impact Assessment Reports

Community-specific Aboriginal and / or Treaty Rights and Interests: Draft Impact Assessment Reports were prepared and issued to each community in June and July 2025, with a 90-day review period.

These community-specific Aboriginal and / or Treaty Rights and Interests: Draft Impact Assessment Reports included Indigenous Knowledge information received from the community prior to January 2025, along with information obtained from publicly available sources. These community-specific reports outlined the assessment process for Aboriginal and / or Treaty Rights and Interests related to the Community Access Road. Communities were given 90 days to provide feedback before their Aboriginal and / or Treaty Rights and Interests: Draft Impact Assessment Report would be finalized in October 2025. The Aboriginal and / or Treaty Rights and Interests: Draft Impact Assessment Reports are confidential, therefore feedback provided is not available publicly. An Aboriginal and / or Treaty Rights and Interests Summary Report is, however, provided in **Appendix O** of the Final Environmental Assessment / Impact Statement.

11.7.2.2.11 Summary of Issues and Feedback from Indigenous Communities

Throughout Milestones 1 through 4, Indigenous communities shared input on a wide range of topics. Feedback included observations from field programs, information about wildlife and culturally significant areas, comments on Aboriginal and / or Treaty Rights and Interests, concerns regarding environmental conditions and cumulative effects, route alignment feedback, input on archaeology, requests for funding support, recommendations about study areas, and comments on consultation methods, timelines, and Indigenous Knowledge and Community Capacity Funding program participation. Some feedback was detailed or specific, while other input reflected general interests, concerns, or requests for more information.

Indigenous community input contributed to the Assessment Process in multiple ways. Feedback influenced field program design, helping to ensure that appropriate measures were in place to limit disruption to people and wildlife, as well as timing field work to accommodate key events such as seasonal hunting periods. Field Monitors from Aroland First Nation and Marten Falls First Nation also participated in a number of

programs offering insights, expertise and advice. Feedback also supported route refinements and selection of the Preferred Route, informed revisions to Aboriginal and / or Treaty Rights and Interests study areas, and shaped the development of community-specific Aboriginal and / or Treaty Rights and Interests Draft Impact Assessment Reports. Community-identified archaeological areas were incorporated into fieldwork and updated archaeology reporting. Cumulative effects assessment methods and the Project Inclusions List were shared and updated in response to engagement. Requests for timeline extensions resulted in extensions to both the Impact Statement schedule and Draft Environmental Assessment / Impact Statement review period. Feedback also informed updates to materials, including maps, language supports, and consultation approaches.

Table 11-9 provides a high-level summary of input and information received from Indigenous communities from October 29, 2021, to September 5, 2025, from the start of the Environmental Assessment for the Community Access Road to the end of the review period for the Draft Environmental Assessment / Impact Statement. The table indicates whether the feedback received informed the Assessment Process. While some feedback directly informed the progression of each milestone or the overall Assessment Process, some input was broad, with limited details (which required ongoing follow-up for additional information from the commenters), or consisted of expressions of general interests or concerns.

Table 11-9: Summary of Input and Information Received from Indigenous Communities and Influence on Milestones 1, 2, 3, and 4

Indigenous Communities Input and Information	How the Development of Milestones 1, 2, 3, and 4 Has Been Informed
• Specific feedback provided on environmental existing conditions: – Specific feedback was provided on the bird field program, including birds observed and comments on their habitats; – Specific feedback was provided on the wolverine field program; – Confidential information regarding the Albany River was provided and is considered as Indigenous Knowledge; – Caribou were identified in the District of Kenora; – Requests to participate in field programs were made; and – Feedback on the Community Access Road footprint was provided, specifically on aggregates.	• Bird observations and comments on their habitats were included in the bird field program to collect bird and Species at Risk data, including habitat features (**Section 8.2.68.2.6.6** and **8.2.6.6**); • 1 site of the wolverine hair snag was changed based on feedback provided from Marten Falls First Nation; • The Assessment Process has been informed by confidential information shared about the Albany River; • General identification of caribou location(s) has been used to aid the field investigations in the Ungulates Technical Support Document (**Appendix M**) and is considered in **Section 8.2.7**; • Members of Marten Falls First Nation and Aroland First Nation were invited to participate in field programs. For the Groundwater and Geochemistry field program, including a flyover and planning for the subsequent drilling program, Aroland First Nation joined the flyovers on July 19 and 20, 2024. Marten Falls First Nation members were able to participate in the summer groundwater monitoring in August 2024, the fall groundwater monitoring in September and October 2024, and the Stage 2 Archaeological Assessment in August 2025; and • Feedback on aggregate sites to support the construction on Segment 2 resulted in changes to the Preferred Route (**Section 4.4.2**). Specifically, feedback from Marten Falls First Nation members resulted in aggregate sites near the Albany River being removed from the Preferred Route.
• Concerns related to environmental existing conditions; additional details requested: – It was noted that a spawning area could be relocated if it would be disrupted by the Community Access Road; – Concern was expressed regarding watersheds; – Concern was expressed regarding caribou migration and impacts to gathering rights; – Concern was expressed related to salting on the road and impacts to nearby rivers; – Alternative 1 of Segment 2 was identified as a sensitive and very precious area; and – It was noted that the Community Access Road should not impede fish passage.	• Specific information was not provided, which made it challenging to address the concerns. Below is information on how Marten Falls First Nation attempted to address these with the limited information in the Environmental Assessment / Impact Statement: – Information on specific spawning areas near the Preferred Route was not provided. It should be noted that the selection of the Preferred Route was informed and chosen based on Indigenous Knowledge received, as well as fish and fish habitat information (**Section 4**). Specific mitigation measures are listed in **Table 10-1** of the Fish and Fish Habitat Technical Support Document (**Appendix G**); – An assessment of the existing watershed has been included in **Section 8.1.4.1**. It includes information on the main characteristics of the tertiary watersheds within the Regional Study Area and how the Regional Study Area was selected; – General identification of caribou location(s) has been used to aid the field investigations in the Ungulates Technical Support Document (**Appendix M**) and is considered in **Section 8.2.7.1**; – Information received to date on caribou migration and impacts to gathering rights has been considered in **Section 9.4.5**. Furthermore, confidential individual Aboriginal and / or Treaty Rights and Interest reports will be prepared for each Indigenous community. These consider caribou and impacts to gathering rights for those communities which identified caribou as part of their Aboriginal and / or Treaty Rights and Interests; – Materials used for winter maintenance, like salt or sand, depend on the type of road. The future owner / operator of the road will have specific approved products, as is the case with the Ministry of Transportation. It is unknown at this time who will own the Community Access Road. Generally, unpaved roads like the Community Access Road do not use salt for de-icing; – Comment on Alternative 1 of Segment 2 was noted and has been considered in the route selection. Alternative 1 is not part of the Preferred Route; and – Comments on fish passage have been considered when developing mitigation measures, such as constructing crossings in a manner that maintains downstream flows and fish passage. All potential effects and recommended mitigation measures and monitoring are included in **Section 9.3.3.5**.

Indigenous Communities Input and Information	How the Development of Milestones 1, 2, 3, and 4 Has Been Informed
• Interests related to environmental existing conditions; additional details requested: – Several communities indicated interest in different topics related to existing conditions without providing specific feedback or comments. One example includes the request to receive field program results for caribou when they become available; – Some communities and community members shared information on traplines within the Study Area and trapline locations; – Several communities provided comments on the Aboriginal and / or Treaty Rights and Interests Existing Conditions Report and the overall assessment of their Aboriginal and / or Treaty Rights; – Several communities provided feedback on their community-specific Aboriginal and / or Treaty Rights and Interests: Draft Impact Assessment Report, after September 5, 2025; and – Some communities provided comments on the Stage 1 and 2 Archaeological Assessment Reports and identified areas of archaeological importance.	• Interest in topics has been noted for each community. Marten Falls First Nation distributed discussion guides related to field programs, educational videos, and webinars on valued components. Information on field programs were shared in the monthly Community Access Road updates and in seasonal Field Notices (sent via email and posted on the Community Access Road website). Early observations and methods for field programs completed to date have been provided at Public Information Centre #3, Public Information Centre #4, and Public Information Centre #5 as information has become available. Meetings were offered based on specific topics of interest to solicit additional feedback and issues. Field program results for individual disciplines are available in **Section 8**; • Any information received on traplines in the Study Area was mapped and considered in the Assessment Process. Additional information on Trapping and Traplines in the Project Study Area can be found in the Final Environmental Assessment / Impact Statement in **Section 8.3.6**, **Section 8.3.9**, and **Figure 8.3-17**. Additionally, **Appendix U** includes information on trapping in Section 5.1.6 and Figure 5-2; • Meetings occurred with five communities (Animbiigoo Zaagi-igan Anishinaabek, Attawapiskat First Nation, Fort Albany First Nation, Long Lake #58 First Nation and Red Sky Métis Independent Nation) to discuss the Aboriginal and / or Treaty Rights and Interests Existing Conditions Report. Comments received during meetings and via email from all communities were considered in the development of the community-specific Aboriginal and / or Treaty Rights and Interests: Draft Impact Assessment Report. Community-specific Aboriginal and / or Treaty Rights and Interests: Draft Impact Assessment Reports were distributed in June and July 2025. Final community-specific Aboriginal and / or Treaty Rights and Interests Reports will be available to each Indigenous community in Spring 2026; and • Any areas of archaeological importance noted in feedback for the Stage 1 and 2 Archaeological Assessment Reports were assessed in fieldwork and considered in updated versions of the reports. All areas retaining archaeological potential will require further assessment, including physical inspection, even if the area is only accessible by helicopter. More information on Archaeology and Cultural Heritage are included in **Section 8.3.6**, **Section 9.5.5**, **Section 10.4.4**, and **Section 10.4.5**.
• Route alignment: – A variety of comments were provided on the route alignment near Marten Falls, including: river and ice levels can be high near Marten Falls and there are locations where the bank is eroding and could affect the road; intense rain could damage the road and impact streams due to erosion; safety concerns were raised regarding truck activities (including dust, noise, low visibility, and speeding) north of the airport and children who play in the same area; and concerns regarding how the Community Access Road may interfere with Marten Falls First Nation activities (for example, gathering firewood, social events); – Feedback was obtained through Marten Falls First Nation community meetings and Public Information Centre #5 contributing to the Preferred Route selection. During October 2023, 2 in-community meetings and Public Information Centre #5 were held to receive feedback on the preliminary technically preferred route recommendation. Many comments were received regarding the proposed route for Segment 2 (Alternative 1: Albany Crossing). Community input did not align with the technically preferred segment proposed by the Project Team. Community members indicated that they did not want the route running along the Albany River and cited a range of concerns including short and longer-term impacts on the river, wildlife, and vegetation, as well as the enjoyment of the river; and – General comments received by communities on the Community Access Road potentially impacting and disturbing key traditional and cultural areas that intersect with the proposed route for the Community Access Road.	• Concerns related to the route alignment closer to Marten Falls were noted and were considered as part of the Route Selection Process. The evaluation has identified the Preferred Route for the Community Access Road, temporary infrastructure and aggregate sources with the least potential for negative effects, greatest opportunity for mitigating negative effects and greatest benefits to the community. **Appendix A** includes the metrics tables with the information used to select the Preferred Route, which considered safety and erosion; and • Based on community members' feedback, the preliminary technically preferred route recommendation was refined to reflect the feedback heard during the October 2023 meetings. The Preferred Route recommendation was altered to reflect the community's preference to have Alternative 4 be the preferred alternative for Segment 2 (Albany Crossing) (**Section 4.4.2**). Receiving Indigenous Knowledge for the area between late 2023 and mid-2024 further confirmed that Alternative 4 for Segment 2 was the decision supported by Marten Falls First Nation Chief and Council and community members. A Band Council Resolution from Marten Falls First Nation Chief and Council confirming the Preferred Route, which considered Alternative 4 was signed by Chief and Council on August 26, 2024.

Indigenous Communities Input and Information	How the Development of Milestones 1, 2, 3, and 4 Has Been Informed
• Cumulative effects, road projects and regional assessment: – Some communities expressed concerns regarding cumulative effects / impacts in the Community Access Road area, including the scope of the Environmental Assessment, impacts from all three road projects (for example, Community Access Road, Webequie Supply Road, and Northern Road Link), the Regional Assessment, and a moratorium on the Ring of Fire activities; – Some communities expressed ongoing concerns with cumulative effects impacts in relation to other road projects and caribou; and – A community provided feedback on Indigenous Knowledge and land and resource use by providing a community-specific Indigenous Knowledge and Land Use Study Report. The report asked the Project Team to consider of cumulative impacts of past and current resource development projects and noted specific concerns including ability to use the lands, water and environment, ease of access to areas, and upcoming development pressures in the region.	• Some of the comments received were directed to the government agencies (for example, Ministry of Energy and Mines; Ministry of Natural Resources and Forestry; Ministry of the Environment, Conservation and Parks; and the Agency) to respond to as they were outside of the scope of the Community Access Road; • In terms of cumulative effects, if specific details are provided, they are considered as part of **Section 10**. This section includes predicted cumulative effects of the Preferred Route with the effects of past, present and reasonably foreseeable projects. Cumulative effects assessment methods and the Project Inclusions List were shared during the Identification of Preferred Alternatives milestone at Public Information Centre #4, at the second Aboriginal and / or Treaty Rights and Interests Forum, and during community meetings in July 2024. An updated Project Inclusions List was shared during the Review of the Draft Environmental Assessment / Impact Statement milestone at Public Information Centre #6 and during community meetings in May 2025; and • The Project Team considered the feedback received through the Indigenous Knowledge and Land Use Study Report and incorporated it into the community-specific Aboriginal and / or Treaty Rights Impact Assessment Report.
• Impacts from COVID-19: – Some communities expressed inability to effectively engage with their community members due to the COVID-19 pandemic.	• Marten Falls First Nation worked with each Indigenous community's preference for how they would like to be consulted and engaged, whether virtually or in person, in light of the COVID-19 pandemic or other crises. Custom consultation plans and protocols were also offered.
• Timeline extensions: – Some communities requested extended Project timelines for both the federal and provincial processes; and – Some communities requested extended Project timelines for providing feedback on the Draft Environmental Assessment / Impact Statement.	• Questions regarding timeline extensions will continue to be addressed, with an effort to understand the needs of each community; • On November 4, 2022, a request for an Impact Statement extension was submitted to the Agency; the extension was granted on January 13, 2023. On November 25, 2022, Marten Falls First Nation advised communities of the Impact Statement Extension Request. Communities were also advised of the Impact Statement timeline extension approval on January 13, 2023, by the Agency; and • Multiple requests were received from Indigenous communities to extend the review period for the Draft Environmental Assessment / Impact Statement after June 23, 2025. Requests were granted, and the comment capture period was extended until September 5, 2025.
• Request for funding: – Some communities expressed need for provincial funding to participate in consultation and engagement activities. There has also been ongoing coordination to onboard communities to the Indigenous Knowledge Program, Community Coordinator Program, and Community Capacity Funding Program, with funding provided by the Project Team.	• While participant funding is issued by the Province and not the Project Team, requests have been shared with the Province for a response; and • Additional funding for Indigenous communities includes participation in the Indigenous Knowledge Program, Community Coordinator Program, Community Capacity Funding Program, and participation in field monitoring program(s) for Marten Falls First Nation and Aroland First Nation. Marten Falls First Nation has followed up with Indigenous communities through phone and email throughout Milestones 1, 2, 3, and 4 regarding funding opportunities (as part of **Section11**'s reporting time period and will continue to do so).
• Revision to Aboriginal and / or Treaty Rights and Interests Study Areas for the Environmental Assessment / Impact Statement: – Feedback from Indigenous communities and the collected information was used to select the Preferred Route. This included concerns regarding revising the Aboriginal and / or Treaty Rights and Interests study areas to focus on the technically Preferred Route.	• Changes were made to the Aboriginal and / or Treaty Rights and Interests for the Environmental Assessment / Impact Statement, which included an increase to the size of the Local Study Area from a 5 kilometre to a 10 kilometre buffer. Changes were also made to the Regional Study Area, increasing its size to more than double the original area; and • In addition, based on inputs from Indigenous communities and groups to date about the potential for the Community Access Road to influence Aboriginal and / or Treaty Rights and Interests outside of the Regional Study Area, given the ranges and movements of caribou, a Caribou Regional Study Area has also been identified.
• Indigenous Knowledge Program participation: – Several Indigenous communities initially expressed concerns related to the Indigenous Knowledge Program, namely timing, issues with gathering to collect Indigenous Knowledge, limited capacity and funding, as well as how the sensitive information would be used; and – Several communities provided Indigenous Knowledge through the Indigenous Knowledge Program.	• Offers to meet with Indigenous communities, both virtually and in person, were continuously made, as were re-introduction meetings with new Chiefs and Councils. Meetings were held with five Indigenous communities to clarify the schedule of the Indigenous Knowledge Program, available funding, and how sensitive and confidential information would be collected and used. Several communities actively participated in the program (**Section 11.3.3**) and Indigenous Knowledge has been used to inform the Assessment Process.

Indigenous Communities Input and Information	How the Development of Milestones 1, 2, 3, and 4 Has Been Informed
• Consultation Methods on the Community Access Road: – Requests were made at community meetings by community members to update maps, including adding names of creeks and streams for legibility purposes and update locations of certain streams; – A few communities highlighted proper and engaged involvement with Marten Falls First Nation was required to receive community support for the Community Access Road; and – Consultation and engagement during the Draft Environmental Assessment / Impact Statement review period, including meeting availability and concerns regarding document translation availability.	• Updates to names on maps and locations of creeks and streams, along with updated locations of creeks, were made to maps and included in the Final Environmental Assessment / Impact Statement; • Efforts to engage with communities on an individual level were made and resulted in multiple Council-to-Council meetings, along with a Task Force between Marten Falls First Nation and Aroland First Nation. This Task Force was able to increase engagement with Aroland First Nation on the Community Access Road; and • Documents supporting the Draft Environmental Assessment / Impact Statement were made available in five languages, including English, French, Ojibway, Cree and Oji-Cree.

11.7.3 Consultation and Engagement with Interested Persons

Throughout the Assessment Process, several interested persons, including academics, local organizations, advisory committees, remote outfitters, trappers, and industry representatives, requested or participated in engagement activities related to the Community Access Road. These engagements occurred alongside broader public outreach described in **Section 11.5** and provided opportunities to discuss Project information, gather questions, and understand the interests of individuals and organizations with land- or resource-based connections in the region.

11.7.3.1 Email and Phone Outreach

Throughout the Assessment Process, the Project Team engaged interested persons through focused email and phone outreach. This outreach supported ongoing communication with individuals and organizations who expressed an interest in the Community Access Road or whose activities may intersect with the Community Access Road.

These methods supported timely distribution of notices, updates, and invitations to engagement activities such as Public Information Centres, webinars, field programs, and the review of the Draft Environmental Assessment / Impact Statement. Interested persons frequently contacted the Project Team by email or phone to request information, provide comments, ask questions about technical material, or seek clarification on timelines and next steps.

The Project Team responded to all inquiries, provided follow-up information, and offered meetings when appropriate. Email and phone correspondence also facilitated targeted outreach to businesses, non-governmental organizations, academic researchers, tourism operators, and members of the public. This consistent and ongoing outreach contributed to transparent communication and helped ensure that interested persons had accessible avenues to engage throughout the Assessment Process.

Broader outreach to mining, forestry, remote outfitter, and trapper groups occurred on October 1, 2024, November 13, 2024, and May 20, 2025, offering one-on-one or informal virtual meetings to discuss potential Project interactions with their operations and discuss potential mitigation measures. Additional calls to remote outfitters on August 8, 2025, resulted in conversations with two operators about the proposed route, potential business implications, and opportunities to provide comments during the Draft Environmental Assessment / Impact Statement review period. Information specific to mining, forestry, outfitter, and trappers is included in the Land and Resource Use

Technical Support Document (**Appendix U**) of the Final Environmental Assessment / Impact Statement.

11.7.3.2 Meetings and Event Participation

Several meetings and presentations were held with interested persons between 2024 and 2025, either at the request of individuals or through invitations extended to the Project Team.

On October 24, 2024, the Project Team met virtually with a Laurentian University professor, who provided a presentation on climate change projections, including information on precautionary approaches, Climate Atlas resources, and climate engagement tools relevant to northern communities.

In November 2024, the Project Team corresponded with Leuenberger Air Services Limited, who initiated contact to discuss concerns related to the Ogoki River crossing. The Project Team attempted to schedule a meeting and, on May 21, 2025, followed up again during the Draft Environmental Assessment / Impact Statement review period to invite Leuenberger Air to participate in consultation activities. As of September 5, 2025, no meeting had been scheduled.

Also in November 2024, the Project Team contacted Twin Lakes Outfitters to offer a meeting regarding their questions about river crossings. Twin Lakes Outfitters indicated they did not have availability to meet at that time, and no additional concerns were shared prior to September 5, 2025.

On November 20, 2024, the Project Team attended the Geraldton Area Natural Resources Advisory Committee fall general meeting as a guest presenter. The presentation provided an overview of the Community Access Road in advance of the Draft Environmental Assessment / Impact Statement, and committee members raised questions about tourism-related activity, access and ownership of the road, and availability of Preferred Route mapping. The Project Team offered an opportunity to meet again at Public Information Centre #6 in Geraldton or at another time convenient to the committee. The committee advised that attending Public Information Centre #6 would suffice. An invitation to attend Public Information Centre #6 was issued to Geraldton Area Natural Resources Advisory Committee.

In May 2024, the Greenstone Economic Development Corporation invited Chief Bruce Achneepineskum to speak at their general meeting. While the Chief confirmed availability, limited preparation time prevented the meeting from being added to the agenda. The Greenstone Economic Development Corporation expressed interest in scheduling a future engagement opportunity, though a date was not secured.

Between March 2 and 3, 2025, the Project Team presented at the Prospectors & Developers Association of Canada Conference, delivering two presentations on the Community Access Road and hosting an information booth to discuss the Community Access Road with conference participants.

11.7.3.3 Review Period of the Draft Environmental Assessment / Impact Statement

Consultation and engagement with interested persons during the Draft Environmental Assessment / Impact Statement review period occurred through the public release process, Public Information Centre #6, online access to the Draft Environmental Assessment / Impact Statement and Assessment Summary Package, and standard communication channels such as email and the Community Access Road website.

Interested persons were able to access the Draft Environmental Assessment / Impact Statement beginning April 22, 2025, and were invited to submit comments during a 60-day review period until June 23, 2025. The Assessment Summary Package was available at Public Information Centre #6, online via the Community Access Road website, and at selected public libraries as viewing locations.

A total of 10 comments were received from interested persons. Submissions were provided by Wildlife Conservation Society Canada, Andomoozwe Outfitters, Albany-Ogoki Outposts, and members of the public. These comments informed the preparation of the Final Environmental Assessment / Impact Statement and allowed the Project Team to incorporate input where possible in the Final Environmental Assessment / Impact Statement. The Record of Consultation and Engagement does not include formal comments submitted on the Draft Environmental Assessment / Impact Statement or responses to those comments. This information is, however, available in the Feedback and Response Log, available in **Appendix C**.

11.7.3.4 Summary of Issues and Feedback from Interested Persons

Input from interested persons spans several key phases of the Assessment Process, including feedback on data collection programs, mitigation strategies, permitting concerns, and potential impacts on local infrastructure.

Interested persons shared concerns about potential effects on fish and fish habitat, spawning areas, wildlife movement, ungulate populations, and how the road could affect hunting activity. They also provided comments related to cultural heritage, the importance of diversity in community well-being interviews, the Terms of Reference

approval process, and how the multiple road projects would be managed by provincial regulators. Input included concerns regarding cumulative effects and suggestions relating to the Project Inclusions List, including adding the KWG Railway Project. Additional feedback related to mapping, potential impacts on tourism outfitters and other businesses, safety concerns associated with traffic and road access, proximity of crossings to camps, and the location of the Ogoki River crossing. Interested persons also expressed perspectives on the duration of the Assessment Process, asked about the implications of the Impact Statement extension, and made suggestions related to Indigenous involvement.

The information provided by interested persons contributed to several aspects of the Assessment Process. Feedback informed fish and fish habitat evaluation, ungulate assessments, the cumulative effects assessment, and the Project Inclusions List. It supported refinements to mapping, contributed to route selection considerations, and was incorporated into land and resource use analyses, including tourism outfitter assessments and public safety considerations. Additionally, the feedback was reflected in assessment planning and responses to delays caused by external events, and in the extension of the Draft Environmental Assessment / Impact Statement review period.

Table 11-10 provides a high-level summary of input and information received from interested persons. The table outlines whether the information received informed the Assessment Process. While some feedback received directly informed the progression of each milestone or the overall Assessment Process, much of the input was broad, with limited details (which required ongoing follow-up for additional information from the commenters), or consisted of expressions of general interests or concerns.

Table 11-10: Summary of Input from Interested Persons and Influence on Milestones 1, 2, 3, and 4

Interested Persons Input and Information	How the Development of Milestones 1, 2, 3, and 4 Has Been Informed
• Concerns related to fish and fish habitat: – Several concerns were shared regarding bridge crossings and impacts to fish and fish habitat; – Concerns were raised fish spawning area; and – Concerns were raised about barriers to wildlife movement.	• Attachment B of the Fish and Fish Habitat Technical Support Document (**Appendix G**) details the results of the fish and fish habitat assessment. Attachment B includes the results of the quality of habitat, potential barriers to fish movements, and the fish sampling program; • The Environmental Assessment / Impact Statement outlines the methodology for completing the fish and fish habitat assessment (**Section 8.1.6**). This includes a review of existing information and field investigations that occurred between 2019 and 2022; • The Environmental Assessment / Impact Statement identifies the potential effects of the alternative routes on fish and fish habitat by evaluating potential effects to fish and fish habitat quantity and quality, use and access to habitat and migration, as well as survival, reproduction, and abundance (**Section 9.3.3**). This assessment also includes a review of potential effects from placing crossing structures on waterbodies and the potential effects from changing public access to recreational angling areas; • Measures and mitigation strategies have been designed to maintain existing environmental conditions to the extent possible with potential effects being minimized or avoided altogether; and • The potential effects and mitigation measures and monitoring strategies are identified in **Section 9.3.3.5**.
• Potential effects and mitigation measures related to ungulates: – Concerns were raised regarding the potential environmental impacts associated with increased hunting activity; and – Concerns were also raised about the potential effects of the Community Access Road on moose and caribou populations.	• The impacts to ungulate populations have been considered in the Ungulates Technical Support Document (**Appendix M**); • Throughout the Assessment Process various field studies have taken place to evaluate the impacts to ungulates including but not limited to tracking and aerial surveys, remote cameras, and caribou collaring which have informed the Final Environmental Assessment / Impact Statement; and • The Land and Resource Use Technical Support Document (**Appendix U**) provides information on remote outfitters, fishing, and hunting.
• Suggestions for additional Indigenous involvement: – It was suggested to involve more knowledge keepers in the Community Access Road.	• Decisions of the Project Team have been guided by Marten Falls First Nation, the Proponent of the Community Access Road. The Project Team regularly received guidance from community members, through both in-community and outside-of-community meetings, which helped inform decisions; • The Project Team has received Indigenous Knowledge from certain Indigenous communities to understand Aboriginal and / or Treaty Rights and Interests related to the Community Access Road. Indigenous Knowledge as well as information on Indigenous land and resource use and cultural practices has helped the Project Team better understand and appreciate the environment with respect to the identity, culture, and heritage of Indigenous communities. Indigenous Knowledge or guidance provided through meetings, emails, surveys, and focus groups was considered in the Technical Support Documents (**Table 3-1**), where available. The Indigenous Knowledge received to date has been woven with scientific approaches, and both knowledge systems have been given equal consideration in forming the foundation for existing conditions, predicting potential project effects, and determining appropriate mitigation and monitoring methods; and • Nine Indigenous communities provided comments on the Draft Environmental Assessment / Impact Statement, comments and responses to the feedback received on the Draft Environmental Assessment / Impact Statement, including how each was considered, is documented in a Feedback and Response Log in **Appendix C**.
• Considerations for Cultural Heritage and Aboriginal and / or Treaty Rights and Interests: – It was suggested to include a diverse sample of interviews related to understanding how Aboriginal and / or Treaty Rights and Interests and community well-being (human health, social, and economics) impacts are considered.	• The community well-being information (socio-community and health) collected targeted subgroups, including women, youth, and Elders, through focus groups and interviews. A total of 10 interviews were conducted with community members, and 10 individuals attended the focus group, including 7 youth. Support was also offered for those needing assistance (for example, to complete surveys).

Interested Persons Input and Information	How the Development of Milestones 1, 2, 3, and 4 Has Been Informed
• Concerns and suggestions regarding provincial involvement and other projects: – Concern was noted regarding the Terms of Reference approval process and lack of Indigenous recognition; and – Concern was noted regarding how the Ministry of the Conservation, Environment and Parks will manage three road projects at the same time.	• The Project Team has acted with input, guidance, and direction from the Marten Falls First Nation Chief and Council. In addition to federal and provincial regulations, the Community Access Road has met Marten Falls First Nation requirements. To meet the provincial requirements, the Project Team prepared a Terms of Reference in accordance with the provincial *Environmental Assessment Act* (Government of Ontario, 1990a). While the 1990 version of the Act is the overarching regulation, amendments are made from time to time and the Terms of Reference was developed in accordance with the regulations in place at the time of submission, and the environmental assessment was developed in accordance with updates in place at the time of submission. Additionally, the Project Team has identified 31 Indigenous communities, Tribal Councils, and Provincial / Territorial Organizations that have the potential to be impacted by the Community Access Road. These groups have been, and will continue to be, consulted and engaged on activities related to the Community Access Road and have been encouraged to share feedback on the Assessment Process; and • It was recommended to contact Government of Ontario and the Agency directly with any concerns regarding their ability to manage the other road projects.
• Concerns and feedback regarding cumulative effects, including the Project Inclusions List: – 1 comment included concerns regarding impacts from Ontario Power Generation on water and fish in the Albany and Ogoki Rivers and noted that water levels being studied need to acknowledge the impacts of diversions and flow levels from dams. It was also noted that although it is not the primary focus of the Community Access Road, Ontario Power Generation may have a greater effect on the environment than the bridges and roads studied as part of the Community Access Road. It was also mentioned that cumulative effects may occur, but impacts from Ontario Power Generation are already occurring; and – Comments were made regarding interest on the cumulative effects Project Inclusions List. A suggestion was made to include the KWG Railway Project in the Project Inclusions List.	• Various sources of information, including Ontario Power Generation reports were reviewed [Section 5.1.2.2 of the Surface Water Technical Support Document (**Appendix F**)]. A water control dam (Waboose Diversion Dam) was identified in the Surface Water Technical Support Document (**Appendix F**) as affecting river flows within the existing conditions Regional Study Area [Section 5.1.2.2 of the Surface Water Technical Support Document (**Appendix F**)]. The Community Access Road included the Ogoki and Long Lac water diversion existing infrastructure as part of the cumulative effects assessment for surface water (**Section 10.2.2**); and • The comment was noted, and the KWG Railway Project was considered for inclusion. The KWG Railway Project is included in the Project Inclusions List in **Section 10**.
• Suggestions for map additions – There were two suggestions for additions to maps provided at public meetings: an outfitters company on Brace Lake and a well location on Marten Falls First Nation reserve.	• Planning for the groundwater and geochemistry program took 2 years and included direct conversations and site visits with representatives from Marten Falls First Nation and Aroland First Nation to review areas of sensitive use. Feedback on well locations, as well as any other information, was encouraged to assist with planning future field programs. The water supply well location has been added to Figure 4-3 in the Groundwater Technical Support Document (**Appendix H**); and • Outfitters were contacted as part of the Land and Resource Use Technical Support Document. Brace Lake Outfitters was contacted but did not engage [Section 4.3.2 of the Land and Resource Use Technical Support Document (**Appendix U)**] Brace Lake (camp) was not identified to be potentially impacted by the Community Access Road.
• Concerns about impacts to businesses: – Concerns related to businesses, including whether businesses negatively affected by the built Community Access Road would be purchased, and general concerns around how the Community Access Road could affect businesses, specifically tourism outfitters.	• Various factors, including the location of outfitters were considered in the selection of the Preferred Route for the Community Access Road (**Section 4**). The analysis of factors considering outfitters concluded that from the alternatives being evaluated the Preferred Route would have a lower net effect on the attractiveness of the area for remote tourism operations (**Appendix A**); • Section 7.2.3 of the Land and Resource Use Technical Support Document **(Appendix U)** indicates that the Community Access Road could provide new recreation and tourism opportunities. However, construction and operations of the Community Access Road may result in disruption to existing activities due to changes in noise, vibration, air quality and views. The Community Access Road may also affect species that are hunted or fished for recreational purposes. The outfitter camps that are in proximity to the road have been identified and assessed as part of the Land and Resource Use valued component; and • As well, as part of the assessment, mitigation has been recommended to avoid and / or minimize the predicted effects [Section 7 of the Land and Resource Use Technical Support Document (**Appendix U**)]. This could include measures to minimize effects that could disturb operations of existing tourism outfitters, or as part of design development of alternative route alignments and watercourse crossing locations.

Interested Persons Input and Information	How the Development of Milestones 1, 2, 3, and 4 Has Been Informed
• Support for Impact Statement extension and request for more information: – General support for the Impact Statement extension request was communicated; and – It was also requested to understand if data collection was impacted with revised timelines due to the Impact Statement extension.	• The Impact Statement Phase Extension Request Work Plan (AECOM, 2022b) was influenced by delays resulting from the COVID 19 pandemic, summer 2021 forest fires, winter 2021 / 2022 heavy snow conditions and unforeseen regulatory requirements. These resulted in delays to field programs.
• Concerns regarding traffic and road safety: – Concerns related to safety due to increased traffic, potential new traffic crossings and location of the Community Access Road entering the Marten Falls First Nation community.	• Intersections of the Community Access Road with southern networks have been assessed and reviewed; signage in the form of advance notification and potential STOP conditions may be incorporated. Clear zone on inside of curves (additional tree clearing) may be enhanced for site lines. From a maintenance safety factor dust suppressant may be used in select areas; • Different routing options have been explored, such as along the river versus coming in from the north of Marten Falls by the airport). Safety considerations that were included in the route selection process included temporary and permanent impacts to watercourses used for traditional transportation and increased traffic through the Marten Falls First Nation community. Marten Falls First Nation had chosen the options further away from the Albany River and coming from the north; and • Various factors, including public safety were considered in the selection of the Preferred Route for the Community Access Road (**Section 4**). The analysis of public safety factors specifically considered road use accidents as an indicator (**Appendix A**) and concluded that all alternatives had relatively equal potential for accidents. The potential for public safety effects from the Community Access Road have been assessed in the Community Well-Being Technical Support Document (**Appendix T**).
• Community Access Road timelines: – Concerns that the Community Access Road Assessment Process is taking too long.	• The Project Team advised that the provincial environmental assessment is a long process due to the size of the Community Access Road. The COVID-19 pandemic, summer 2021 forest fires, winter 2021 / 2022 heavy snow conditions and unforeseen regulatory requirements also impacted timelines and caused delays, especially to field programs; and • The review period for the Draft Environmental Assessment / Impact Statement was extended from June 23, 2025, to September 5, 2025, due to requests for extensions from Indigenous communities and government regulators.
• Information regarding Community Access Road access, engineering and design: – Concerns related to the general public's access and use of the Community Access Road; – Concerns about traffic; – Concerns regarding proximity of river crossings to camps; and – Concerns about Ogoki River crossing.	• Information on traffic can be found in **Appendix W**; • The Preferred Route was selected based on feedback received from Indigenous communities and interested persons. Information on the Preferred Route is available in **Section 4.4**; • **Section 4.4.1** contains information on Segment 1 – Ogoki Crossing; and • Information on bridge construction can be found in **Section 7.2.3.5**.

11.7.4 Consultation and Engagement with Government Agencies

Table 11-11 provides a high-level summary of input and information received from government agencies. The table outlines whether the information received informed the Assessment Process. While some feedback received directly informed the progression of each milestone or the overall Assessment Process, much of the input was broad, with limited details (which required ongoing follow-up for additional information from the commenters), or consisted of expressions of general interests or concerns.

Table 11-11: Summary of Input from Government Agencies and Influence on Milestones 1, 2, 3, and 4

Government Input and Information	How the Development of Milestones 1, 2, 3 and 4 Has Been Informed
• Environmental Assessment methodology and study plan comments: – Feedback was provided on the study plans and the Environmental Assessment methodology across all the valued components assessed in the Environmental Assessment / Impact Statement.	• Supporting Technical Documents were prepared by each technical discipline and are appended. Each includes information on how comments received on associated study plans were used to inform assessment methodology or their specific scope and studies. The Supporting Technical Documents also describe deviations from recommendations and the reasoning behind this, if applicable.
• Eastern Migratory Caribou mitigation: – Feedback was provided on the need for tailored strategies for Eastern Migratory Caribou compared to Boreal Caribou.	• The Environmental Assessment / Impact Statement includes tailored mitigation strategies for Boreal Caribou and Eastern Migratory Caribou: – The mitigation strategies account for the distinct sensitivities of each species to disturbances, with specific life history considerations factored into the plans (**Section 9.4.5.5**); and – Feedback on caribou habitats has directly influenced site-specific measures in wildlife management (**Section 9.4.5.5**).
• Sensitive Data License Agreement and caribou collaring: – Requests were made to extend timelines for caribou collaring data and amend the sensitive data license agreement.	• A Sensitive Data License Agreement has been used to maintain confidentiality measures for sensitive caribou data. The agreement has been amended with ongoing discussions with relevant ministries to help ensure compliance with the *Endangered Species Act* and data protection requirements (Government of Ontario, 2007); and • Caribou collaring programs were conducted between April 2020 and March 2024, to identify caribou movement throughout the study area. The caribou collaring program was extended due to collars not falling off automatically; this is not unusual due to the technology used. Additionally, the collars could not be manually removed in 2024 as there was not enough snow to safely remove the collars from the caribou.
• Timeline extension: – A request was made for a timeline extension due to the impacts of extreme weather, COVID-19, and other challenges.	• The Environmental Assessment / Impact Statement describes timeline extensions: – A detailed explanation of how COVID-19, summer 2021 forest fires, winter 2021 / 2022 heavy snow conditions, and unforeseen regulatory requirements impacted the timeline is included in **Section 5.1.2**. As a result of these challenges, a timeline extension request was submitted to the Agency.
• Deviations from the Tailored Impact Statement Guidelines: – Concerns were expressed about deviations from the Tailored Impact Statement Guidelines in the study plans.	• The Technical Support Documents conform with the Tailored Impact Statement Guidelines: – They provide detailed rationales for deviations when necessary, providing transparency and alignment with regulatory expectations (Section 8 of the Technical Support Document for each valued component); and – Feedback from the Identification of Preferred Alternatives was used to fine-tune cumulative effects assessment methods (Section 9 of the Technical Support Document for each valued component).
• Economic impact assessments: – Support was requested from the Ministry of Transportation to assess economic impacts and address concerns regarding the economic valued components.	• The Community Well-Being Technical Support Document (**Appendix T)** incorporates economic impact assessments: – Support from the Ministry of Transportation was secured to assist in evaluating the effects on the economic valued components [Community Well-Being Technical Support Document; (**Appendix T**)]; and – Specific feedback on economic concerns has been incorporated into the Community Well-Being Technical Support Document (**Appendix T**). Recommendations for mitigation measures and monitoring opportunities are included in Sections 7, 8 and 9 of the Community Well-Being Technical Support Document (**Appendix T**)**.**
• Municipality of Greenstone Road Impacts: – Concerns were raised by the Municipality of Greenstone regarding potential negative impacts on local roads due to the Community Access Road.	• The Community Well-Being Technical Support Document (**Appendix T**) addresses feedback from the Municipality of Greenstone: – Potential impacts on local roads due to the Community Access Road-related vehicle activity are included in the Community Well-Being Technical Support Document (**Appendix T**). Changes to road use and traffic volumes on existing road infrastructures have been identified as an impact. Additional consultation will occur throughout the remaining milestones, along with continued examination of road maintenance and mitigation strategies.
• Permitting issues and hydrological programs: – The Ministry of the Environment, Conservation and Parks raised concerns about permitting issues and timelines for the hydrological field programs.	• The Surface Water Technical Support Document (**Appendix F**) addresses permitting issues raised by the Ministry of the Environment, Conservation and Parks: – The study plan review process was updated to include provincial for future hydrological monitoring programs; and – Revised timelines and permitting submissions were implemented based on feedback from hydrological program consultations.
• Cumulative effects project inclusion list: – The Ministry of Natural Resources suggested Wataynikeneyap Powerline should be included in the cumulative effects assessment.	• The Environmental Assessment / Impact Statement includes a cumulative effects assessment that considers reasonably foreseeable future projects within the study area: – Wataynikeneyap Powerline has been included for consideration in the cumulative effects assessment by the relevant valued components.

Government Input and Information	How the Development of Milestones 1, 2, 3 and 4 Has Been Informed
• Groundwater program delays and draft assessment with 1 year of groundwater data: – The Agency requested clarification related to the proposed approach to submit a Draft Environmental Assessment / Impact Statement based on 1 year of groundwater data – The Agency requested confirmation of the hydrograph period to be presented, identification of which groundwater and peatlands program elements would be delayed, and a description of how the draft dataset differs from the approach previously deemed acceptable by the Federal Review Team.	• Groundwater assessment approach and supporting documentation were refined based on Agency and technical review input regarding delayed field program elements and the 1-year dataset basis: – The assessment describes the modified groundwater data collection approach and clearly differentiates the 1-year dataset basis from the previously accepted approach, including clarification of hydrograph coverage and delayed program elements; and – Monitoring methods and terminology were clarified based on Agency questions (for example, hydrographs based on datalogger-equipped wells and “monitoring events” as planned site visits for logger downloads and sampling), with confirmation that Natural Resources Canada’s groundwater expert reviewed the approach and deemed it acceptable (March 22, 2023).
• Issues with maps (Consultation Methods): – It was noted by the Ministry of Energy and Mines that viewing maps should include the names of creeks and streams for legibility, including Marten Falls (the actual falls) and Wabassi Lake, and that Calbert Creek was shown in the wrong location.	• The Environmental Assessment / Impact Statement reflects community feedback on map legibility and accuracy: – Feedback from the May 28, 2025, Marten Falls First Nation community meeting informed updates to mapping presented in the Environmental Assessment / Impact Statement to improve legibility (addition of key creek / stream and feature names, including Marten Falls and Wabassi Lake) and to correct the location of Calbert Creek.
• Wildlife Scientific Collector’s Authorization for wolverine work (Field Studies, Wildlife, Trap Lines): – The Ministry of Natural Resources and Forestry provided direction on authorization requirements for wolverine hair snag surveys, including authorization duration and coverage requirements. – The ministry advised the Wildlife Scientific Collector’s Authorization can only be issued for a 1-year period, must be in place for both collection periods and while samples are at the lab due to reporting requirements, and requested a ministry-issued letter to licensed trappers describing the program, potential implications, and Project Consultant contact information.	• The Environmental Assessment / Impact Statement reflects ministry direction on permitting scope and trapline communications for the wolverine program: – Ministry direction informed the permitting approach for the wolverine field program, including ensuring authorization coverage aligns with collection timing and reporting conditions (including the period when samples are at the lab); and – Ministry input informed how trapline engagement and communications were carried out and documented, including provision of program details and points of contact to licensed trappers to support awareness and coordination.
• Overlapping License Agreement and *Crown Forest Sustainability Act* -exempt Forest Resource License (Provincial Permit): – The Ministry of Natural Resources and Forestry advised that Crown Forest Sustainability Act–exempt Forest Resource Licensing operates on a fiscal year basis (April 1 to March 31), with issued licences valid for 1 fiscal year, and suggested revising the Overlapping License Agreement term to align with the fiscal year-based licensing system (for example, January 1, 2022, to March 31, 2023). – The Ministry of Natural Resources and Forestry confirmed prerequisites for tree clearing authorization (for example, Letter of Authority and Land Use Permit) and directed coordination on the Overlapping License Agreement to support tree clearing for the groundwater monitoring drilling program.	• The Environmental Assessment / Impact Statement reflects ministry direction on authorizations sequencing and fiscal-year alignment for tree clearing permits: – Ministry input informed the sequencing and documentation of provincial authorizations required for tree clearing, including prerequisites identified by the Ministry of Natural Resources and Forestry and the fiscal year-based validity of forest resource licences exempt under the Crown Forest Sustainability Act; and – The Environmental Assessment / Impact Statement includes the Crown Forest Sustainability Act–exempt Forest Resource Licence and the Permit to Remove in the authorizations list, consistent with the permitting approach used to support the groundwater monitoring drilling program.

11.8 Considerations of Identity and Gender-Based Analysis Plus

The *Impact Assessment Act* requires Gender-Based Analysis Plus to be applied to impact assessments in Canada. Gender-Based Analysis Plus is not a specific method but an adaptable approach that assesses inequalities and impacts of policies, programs, and projects on diverse groups and intersecting identities (for example, gender, sexual orientation, age, race, ethnicity, class, religion, and mental or physical disability) (Women and Gender Equality Canada, 2024). This approach supports understanding of socio-cultural and historical contexts, including those shaped by colonization.

As the Community Access Road is led by Marten Falls First Nation and involves extensive Indigenous engagement, a Gender-Based Analysis Plus lens has been incorporated throughout consultation and engagement activities. This approach underscores the importance of considering diverse needs and perspectives within the communities participating.

Efforts to respect and incorporate Indigenous Knowledge are reflected in the guiding principles (see reference to the Terms of Reference Consultation Plan in **Section 11.2.2**). The first-person voice of Marten Falls First Nation in **Section 1**, Our Story, places their experience, sovereignty, and cultural values at the forefront. Gender-Based Analysis Plus considerations are further described and included in **Section 6.2** of the Final Environmental Assessment / Impact Statement and supporting Technical Support Documents.

To fulfill requirements of the *Impact Assessment Act*, the Consultation and Engagement Program made efforts to consider a range of perspectives from marginalized, vulnerable, and / or at-risk sub-populations who often experience inequality and barriers. This included making efforts where possible to provide opportunities for engagement with:

- Indigenous peoples;
- Visible minorities;
- Women;
- Youth;
- Elders;
- Members of the Two-Spirit, Lesbian, Gay, Bisexual, Transgender, Queer, Questioning, Intersex, and Asexual community;

- Indigenous activity-based subgroup (for example, hunter, trapper, fishermen);
- Non-Indigenous activity-based subgroups (for example, recreationalists, snowmobilers, outfitters, tourism establishment operators); and
- People with disabilities.

Marten Falls First Nation also consulted and engaged other subgroups identified by communities during consultation and engagement. The information from these activities was considered by applicable disciplines for the purposes of data collection and consideration of disproportionate effects. More detailed information about the Community Access Road's Gender-Based Analysis Plus study is in **Section 6.2**.

The Consultation and Engagement Program included opportunities to hear from a diverse range of perspectives from interested communities and their members, including subgroups, identified in the Agency's Indigenous Engagement Partnership Plan and the Public Participation Plan. The following consultation and engagement approaches and activities include a Gender-Based Analysis Plus framework:

Guiding Principles:

- The guiding principles adopted for the Assessment Process encourage multiple and ongoing opportunities for dialogue, including participation of relevant self-identified subgroups (for example, women, youth, Elders). They also demonstrate an effort to incorporate Indigenous ways of being and knowing into the plan that guided consultation and engagement on the Community Access Road.

In-person Community Meetings:

- Where possible, meetings, activities and workshops were hosted in Marten Falls or neighbouring Indigenous communities, providing women, Elders, youth, and other community members and land users the opportunity to be in place when discussing the Community Access Road;
- During the Marten Falls First Nation member meeting December 6, 2022 (for Public Information Centre #4), youth commented that they would be more enticed to join meetings if door prizes included items like gift cards (for example, Walmart) or if larger prizes, like cell phones, were offered. These suggestions were applied to future meetings and advertised in notices to community members;

- Community Access Road branded colouring pages were provided for children at community and public meetings to allow attending families to participate in the meetings and for youth participation; and
- During the May 2025 Marten Falls First Nation and Aroland First Nation member meetings, a Story Beads exercise was held to create a space for intergenerational dialogue and shared storytelling using beadwork as a metaphor. Marten Falls First Nation and Aroland members shared their hopes and concerns around the Community Access Road including increased access to food and reduced costs of living, along with concerns about outsider access and substance abuse.

Accessibility for Attending Meetings:

- Private car service was offered to improve accessibility for Marten Falls First Nation and Aroland First Nation community members to attend community meetings in Thunder Bay.
- Private shuttle service to the Public Information Centres held in Geraldton, Ontario were offered to neighbouring Long Lake #58 and Ginoogaming First Nations. There was no expressed interest in the offer until Public Information Centre #6, when Long Lake #58 hired their own shuttle; the cost of the service was paid by the Project Team. The shuttle facilitated attendance of Elders at the meeting.

Youth Participation:

- In November 2021, a youth engagement program was delivered in Marten Falls. The program had different activities separated by age groups (Kindergarten to grade 2; grades 3 to 5; grades 6 to 8; and grade 9+ / post-secondary). Activities focused on continuing awareness, excitement, education and pride about the Community Access Road. Discussion was encouraged and opportunities to learn about science, technology, and engineering and math careers were provided;
- On June 20, 2023, a youth engagement program for Marten Falls First Nation youth living outside of the Community was held as part of the Socio-Community Study (**Appendix T**). The purpose of the youth engagement program was to encourage Marten Falls First Nation youth to participate in decisions that will affect them in the future, and to acknowledge their unique perspective;
- An in-community meeting was held in Marten Falls on July 16, 2024. Summer is a time when high school-aged youth are out of school and in the community; this timing allowed youth to attend and learn about the Community Access Road;

- In July and August 2024, Marten Falls First Nation youth were financially compensated to participate in the review of Sections 1 through 4 of the Draft Environmental Assessment / Impact Statement (Our Story, Why We Need This Road, Our Roles, and How We Selected Our Road) in advance of the release; and
- In October 2024, Marten Falls First Nation youth were invited to participate in a Sharing Circle hosted by the Marten Falls First Nation Community Coordinator at community-specific meetings in Thunder Bay and Marten Falls First Nation, respectively. Financial compensation was offered to participants; however, no registrations were received.

Women Participation:

- In October 2024, Marten Falls First Nation women were invited to participate in a Sharing Circle hosted by the Marten Falls First Nation Community Coordinator at community-specific meetings in Thunder Bay and Marten Falls First Nation members, respectively. Financial compensation was offered to participants; however, no registrations were received.

Financial Opportunities for Subgroups:

- Opportunities were provided to specific Indigenous communities to hire Community Coordinators; two women were hired as Marten Falls First Nation Community Coordinators; and
- Young Marten Falls First Nation members (18+), including over 11 women, were hired as field program support staff.

Valuable Elder Knowledge:

- Meetings were held with Elders from Long Lake #58 First Nation on November 10, 2023, and June 20, 2024, to receive updates on the Community Access Road, including the preliminary technically preferred route. A group of Elders from Long Lake #58 also attended Public Information Centre #6 in Geraldton, speaking with Project Team Consultants and the Marten Falls First Nation Community Access Road Senior Advisor;
- On June 11, 2024, Elders participated in a one-day Elders gathering at the Three-Road Project Gathering and Expo; and
- In July and August 2024, Marten Falls First Nation Elders (including women) participated in review sessions for Sections 1 through 4 of the Draft Environmental Assessment / Impact Statement (Our Story, Why We Need This Road, Our Roles, and How We Selected Our Road), in advance of the release; they were financially compensated for their efforts.

Virtual Opportunities:

- Opportunities were provided for people to participate in webinars from outside of the community (youth) or from their homes, including providing feedback via online surveys. Of note, at a Marten Falls First Nation meeting on February 2, 2022, a community member noted their 16-year-old watched the zoom meeting and was very interested.

Youth Preferences for Communication:

- During the Marten Falls First Nation meeting on December 6, 2022, in advance of Public Information Centre #4, youth attended and mentioned that the Facebook group was the best way to receive information, and that in-community events do not really work for them as they are often away at school. As a result, the Marten Falls First Nation Community Coordinators made sure content was posted on the private Marten Falls First Nation Facebook page; and
- Based on demographic reach and feedback received, Instagram and LinkedIn profiles were created for the Community Access Road in March 2024 to provide updates to youth and Indigenous professionals online.

The following are challenges observed with Gender-Based Analysis Plus in relation to the Community Access Road:

- Marten Falls First Nation youth typically were not able to attend in-community events as they attend high school outside of the Community; however, by scheduling in-community meetings during the summer, there was an increase in youth participation;
- A comment was received at Public Information Centre #3 noting Marten Falls First Nation members' interest in trapping and community events are not as popular as before. Youth do not seem to have interest in these activities;
- Signing in at meetings and engagement events (Public Information Centres) is optional, so there is not always a true representation available of those who identify as part of a subgroup; and
- The subgroups including, but not limited to, Lesbian, Gay, Bisexual, Transgender, Queer, Questioning, Intersex, Asexual and Two-spirited individuals may be unwilling / uncomfortable to self-identify.

11.9 Consultation and Engagement After Milestone 4 up to Final Submission

As previously noted, the reporting period of the Record of Consultation and Engagement ends at the completion of Milestone 4 (September 5, 2025). Consultation and engagement activities, however, occurred after the end of this reporting period but before the submission of the Final Environmental Assessment / Impact Statement. These are activities—occurring between September 6, 2025, up to February 13, 2026—are described below to demonstrate advancements in consultation and engagement efforts. Descriptions of upcoming activities and opportunities for consultation and engagement after submission of the Final Environmental Assessment / Impact Statement is provided in **Section 11.10.**

11.9.1 Public Information Centre #7 (Virtual)

Notification: Notification of Public Information Centre #7 was provided through an email distributed on January 27, 2026, website notifications and social media posts.

Dates and Locations: Virtually on February 4, 2026.

Objectives and Topics: Public Information Centre #7 focused on the release of the Final Environmental Assessment / Impact Statement. Information presented included: an overview of the Assessment Process; the selection of the Preferred Route; feedback received on the Draft Environmental Assessment / Impact Statement; and the Final Environmental Assessment / Impact Statement review process. The presentation was pre-recorded and uploaded to the Community Access Road website on the same day as the Public Information Centre to allow those who were unable to attend the live session the opportunity to view it at their convenience.

Attendees: A total of 31 individuals registered for the Public Information Centre #7, and approximately 22 participants attended. Attendees represented a broad cross-section of audiences, including community members and / or representatives from six different Indigenous communities, federal and provincial government agencies, interested persons, environmental organizations, and industry representatives.

Feedback: A Question and answer period with the Project Team members followed the pre-recorded presentation. Key question and comment themes reflected a range of interests which included job opportunities and access to job information, construction timelines, the Final Environmental Assessment / Impact Statement review process and timeline, Community Access Road governance, maintenance, and monitoring, Aboriginal and / or Treaty Rights and Interests feedback and summary document, access and security, and river crossings.

11.9.2 Meetings

The following meetings were held with Indigenous communities, Marten Falls First Nation, and interested persons to help prepare for the release of the Final Environmental Assessment / Impact Statement.

Meetings with Indigenous Communities

A series of meetings took place to support Public Information Centre #7, including hybrid meetings with Marten Falls First Nation on February 3 and 4, 2026, in Thunder Bay and Marten Falls, respectively. A virtual meeting was also held for Aroland First Nation on February 4, 2026, however, due to a tragedy in the community no one was able to attend.

At each meeting, a presentation provided: an overview of the Assessment Process; the selection of the Preferred Route; feedback received on the Draft Environmental Assessment / Impact Statement; and the Final Environmental Assessment / Impact Statement review process. Following each presentation, a question and answer period was hosted.

On January 26, 2026, the Project Team provided a presentation to Mushkegowuk Council. The presentation provided an overview of the Community Access Road and the Assessment Process. Information was also provided on the selection of the Preferred Route and release of the Final Environmental Assessment / Impact Statement.

Meetings with Interested Persons

On October 21, 2025, the Project Team met with Wildlife Conservation Society Canada to discuss wolverine denning habitat, caribou habitat, mitigation hierarchy, and monitoring and survey techniques. The Project Team noted that the caribou and wolverine effects assessments include an evaluation of aerial surveys, discussion of mitigation and monitoring approaches, and consideration of cumulative effects.

Meetings with Government Agencies

A series of meetings and communications were undertaken with government agencies to support review of the Draft Environmental Assessment / Impact Statement and to clarify next steps in the Assessment Process. These activities included an interagency meeting and follow-up discussions with the Ministry of Natural Resources and the Species at Risk Branch regarding comments received on October 17, 2025. Meetings were also held with the Ministry of the Environment, Conservation and Parks to discuss questions arising from feedback on the Draft Environmental Assessment / Impact

Statement, and the proposed submission plan for the Final Environmental Assessment / Impact Statement including anticipated next steps and overall process.

In addition, the Project Team shared the Progress Report 4 Introduction and the Aboriginal and / or Treaty Rights and Interests Summary Report with the Impact Assessment Agency of Canada to support preparation of the Impact Statement.

11.9.3 Other Communication Activities

Communication activities also occurred during this period. Monthly E-blasts continued to be distributed to the contact list with supporting updates provided via social media. A video—Why the Road to Marten Falls—was also released on social media channels sharing the benefits of the Community Access Road for Marten Falls. These include a lower cost of living, increased housing, a positive effect on mental health, and freedom to travel for community members. Targeted emails continued to be sent to each Indigenous community's group of key contacts to follow up on ongoing conversations and provide updates on the Final Environmental Assessment / Impact Statement.

A Fall Field Notice was distributed on September 16, 2025, via email and posted on the website. The field notice included updates on the groundwater well decommissioning, geotechnical investigation, and SkyTEM geophysical survey field programs which were scheduled to take place in fall 2025. On September 23, 2025, an additional field notice was distributed via email and posted on the website to provide further information on the SkyTEM geophysical survey that was planned to take place in fall 2025. A Geotechnical Investigation Field Notice was distributed on November 10, 2025, via email and posted on the website. The field notice included information on the geotechnical investigation program, which was planned for November and December 2025. In consideration of feedback from Indigenous communities, the field work was postponed to avoid winter hunting activities.

Progress Report 4 was distributed to Indigenous communities for review on January 16, 2026; communities were asked to provide their feedback by February 2, 2026, noting that they could also provide comments during the public review process of the Final Environmental Assessment / Impact Statement. An extension to February 13, 2026, was granted for two communities who requested more time to review their individual report. Feedback was provided by one community and was considered in the Final Environmental Assessment / Impact Statement.

The Stage 2 Archaeological Assessment Report was also released to Indigenous communities for review on January 16, 2026, with feedback requested by February 18, 2026. Any feedback received will be considered in the detail design of the Community Access Road.

11.9.4 Notice of Environmental Assessment Availability

The Ministry of the Environment, Conservation and Parks requires a notice of Environmental Assessment availability to be electronically distributed 2 weeks in advance of the Notice of Submission. On February 6, 2026, the Project Team sent an advance notice of availability and upcoming Notice of Submission email to the contact list. The email was intended to help people plan for the upcoming review period and be informed about next steps. The Notice of Submission was attached, including information on the formal publication on February 20, 2026.

11.10 Ongoing and Future Consultation and Engagement

Activities that occurred on and shortly after submission of the Final Environmental Assessment / Impact Statement, February 20, 2026, are summarized below.

11.10.1 Notice of Submission

The Notice of Submission is a formal public notice issued when a Project Proponent submits a completed environmental assessment to the Ministry of the Environment, Conservation and Parks. The Notice of Submission for the Community Access Road is distributed to the Community Access Road contact list, posted on the Community Access Road website, and advertised in newspapers. The notice provides information on the Assessment Process, where to access the Environmental Assessment / Impact Statement, in-person viewing locations for the Assessment Summary Package, the review period length, and how to provide comments.

11.10.2 Assessment Summary Package

An Assessment Summary is provided to support the review of the Final Environmental Assessment / Impact Statement. This includes the Chief's letter, an executive summary, plain-language summaries of information contained in the Final Environmental Assessment / Impact Statement and associated Technical Support Documents, and frequently asked questions. The information in the Assessment Summary Package will be available online including translations in Ojibway, Oji-Cree, Cree, and French.

11.10.3 Comments on the Final Environmental Assessment / Impact Statement

Proponent-led consultation and engagement officially ends with submission of the Final Environmental Assessment / Impact Statement to the regulators. Consultation and engagement during the review of the Final Environmental Assessment / Impact Statement is undertaken by the federal and provincial agencies. The Proponent, however, will support the regulators in responding to comments on the Final Environmental Assessment / Impact Statement, including attending meetings, to support the comment period for the Final Environmental Assessment / Impact Statement.

11.10.4 Release of Community-Specific Aboriginal and / or Treaty Rights and Interests: Final Impact Assessment Reports

Following the release of the Draft Environmental Assessment / Impact Statement, community-specific Draft Aboriginal and / or Treaty Rights and Interests: Draft Impact Assessment Reports (Draft Reports) were issued to Indigenous communities through June and July, 2025. The Draft Reports included information from publicly available sources, as well as any Indigenous Knowledge Reports received from communities before January 2025. The reports outlined the assessment process for Aboriginal and / or Treaty Rights and Interests related to the Community Access Road. Indigenous communities had 90 days to review and provide feedback on the Draft Reports. The Final Aboriginal and / or Treaty Rights and Interests: Impact Assessment Reports will be issued to individual communities following the submission of the Final Environmental Assessment / Impact Assessment.

11.10.5 Release of Country Foods and Water Use Assessment Report

The Community Well-Being Team conducted a Country Foods Program where community members from Aroland First Nation and Marten Falls provided samples of foods that were hunted, fished, or gathered from the land and water—including walleye, moose, goose, beaver, and blueberries—to assess existing contaminant levels in traditional food species commonly harvested and consumed in the community. These species were selected based on conversations with Marten Falls First Nation Senior Community Advisors and the Marten Falls First Nation Community Coordinator. Samples were accepted at the May 2025 meetings with Aroland First Nation and Marten

Falls First Nation members. These samples were used to understand which contaminants may currently be present in local foods and water, and will serve as a baseline from before the Community Access Road is built. These reports will be made available to Aroland First Nation and Marten Falls First Nation following the release of the Final Environmental Assessment / Impact Statement.

In addition, a team of two Marten Falls First Nation Community Access Road Project Consultants and a Marten Falls First Nation member visited various sites in the Community to retrieve water samples. Water samples were taken from the Albany River near the water treatment plant and at the dock where people are known to swim. The Marten Falls First Nation member recommended sampling sites based on where members are known to swim or collect water for drinking. The results will be shared with the Community following the release of the Final Environmental Assessment / Impact Statement.

11.10.6 Cultural Heritage Reports

The Draft Cultural Heritage Evaluation Report will be made available to Indigenous communities for review and comment before finalization.

11.10.7 Meetings with Neighbouring Indigenous Communities

Indigenous communities have expressed interest in meetings to support their review of the Final Environmental Assessment / Impact Statement and build relationships as the Community Access Road moves into the next phase. It is anticipated that additional meeting requests will be made following submission of the Final Environmental Assessment / Impact Statement. These will be responded to and facilitated by the federal and provincial government.

11.10.8 Meetings with Interested Persons

Ongoing engagement with local outfitters is expected to continue through this next phase of the Assessment Process for the Community Access Road. A meeting with a local outfitter was being planned during preparation of the Final Environmental Assessment / Impact Statement. The date, however, was not yet finalized and the meeting is expected to take place shortly after the release of the Final Environmental Assessment / Impact Statement.

The Project Team will also attend the 2026 Prospectors & Developers Association of Canada Conference from March 1 to 4, 2026.

11.10.9 Other

A Final Environmental Assessment / Impact Statement video will be posted to accompany the submission of the Final Environmental Assessment / Impact Statement. It will provide a summary of what is included in the Final Environmental Assessment / Impact Statement, information on how to provide feedback, and the importance of receiving feedback for the Community Access Road.

11.11 Record of Consultation and Engagement

The Record of Consultation and Engagement is a key component of the Final Environmental Assessment / Impact Statement, supporting fulfillment of federal and provincial requirements and commitments set out in the Marten Falls-Ontario Memorandum of Understanding on Shared Consultation Responsibilities. The Record of Consultation and Engagement is required by the Ontario *Environmental Assessment Act* and prepared in accordance with the Ministry of the Environment, Conservation and Parks Code of Practice.

The Record of Consultation and Engagement documents how input from Indigenous communities, government agencies, and interested persons was sought, received, and considered throughout the Assessment Process. It demonstrates the Project Team's commitment to meaningful consultation and engagement, transparent decision-making, and regulatory compliance.

11.11.1 Purpose and Reporting Period

The purpose of the Record of Consultation and Engagement is to: provide a transparent record of all communication, consultation, and engagement activities; categorize feedback received; and describe how input has informed the Assessment Process.

The reporting timeframe started with release of the Notice of Commencement of Environmental Assessment on October 29, 2021, and ended on September 5, 2025. Consultation and engagement activities for Milestones 1, 2, 3, and 4 are included:

- Milestone 1: Notice of Commencement of Environmental Assessment;
- Milestone 2: Effects Assessment Methods;
- Milestone 3: Identification of Preferred Alternatives; and
- Milestone 4: Review of the Draft Environmental Assessment / Impact Statement.

Consultation and engagement on Milestone 5: Review of Final Environmental Assessment / Impact Statement will be undertaken by the federal and provincial government agencies, with support from the Proponent up to the regulators' decision.

Formal comments submitted on the Draft Environmental Assessment / Impact Statement and responses to those comments are available in the Feedback and Response Log, **Appendix C** of the Final Environmental Assessment / Impact Statement.

11.11.2 Structure of the Record of Consultation and Engagement

The Record of Consultation and Engagement is comprised of multiple reports prepared at key milestones of the Assessment Process and separated by each audience group (Indigenous communities, government agencies, and interested persons).

While **Section 11** of the Final Environmental Assessment / Impact Statement is not a Record of Consultation and Engagement, it provides introductory content and a high-level summary of all consultation and engagement undertaken with Indigenous communities, government agencies, and interested persons.

Indigenous Communities: The Record of Consultation and Engagement for Indigenous Communities is comprised of four Milestone Progress Reports, each corresponding to a specific milestone of the Assessment Process:

- Milestone 1: Notice of Commencement of Provincial Environmental Assessment (October 29, 2021, to June 30, 2022);
- Milestone 2: Effects Assessment Methods (July 1, 2022, to May 31, 2023);
- Milestone 3: Identification of Preferred Alternatives (June 1, 2023, to July 31, 2024); and
- Milestone 4: Draft Environmental Assessment / Impact Statement (August 1, 2024, to September 5, 2025).

These reports were released as community-specific documents for each individual Indigenous community to review and comment before being release publicly.

Government Agencies: Consultation and engagement with government agencies is documented in a single Record of Consultation and Engagement covering the full reporting period from October 29, 2021, to September 5, 2025.

Interested Persons: Consultation and engagement with interested persons is documented in a single Record of Consultation and Engagement covering the full reporting period from October 29, 2021, to September 5, 2025.

All Final Environmental Assessment / Impact Statement Records of Consultation and Engagement are provided in **Appendix X**. Note a Draft Record of Consultation and Engagement for Interested Persons was released as part of the Draft Environmental Assessment / Impact Statement for review and comment.

The following sections are included in the interested persons and Indigenous community Records of Consultation and Engagement:

- **Summary of Key Consultation and Engagement Activities Undertaken During Preparation of the Environmental Assessment / Impact Statement** - an overview of key consultation and engagement activities, including when and where they happened, the number of participants, including any subgroups represented (if available), and a description of the associated information materials provided;
- **Summary of Feedback Received and Response / Action** - identifies specific issues raised, the corresponding topic, communication channel, response / action to the issue, and how it was addressed or considered in the Environmental Assessment / Impact Statement (if applicable);
- **Consultation and Engagement Log** - a detailed correspondence tracking table including date the correspondence occurred, method of consultation and engagement (for example, email, phone call, letter, in-person meeting), whether it was incoming or outgoing, contact name and title (if applicable), Project Team member involved (for example, Marten Falls First Nation Senior Community Member Advisor, Marten Falls First Nation Project Team, or Marten Falls First Nation Project Consultant), and a summary of the correspondence; and
- **Appendices** - the appendices include notices, letters, meeting summaries / minutes, presentations and correspondence, as applicable for each Record of Consultation and Engagement. Comment and interest tables for interested persons and Indigenous communities are available in those respective reports.

The Record of Consultation and Engagement for Indigenous Communities also includes community-specific tables to demonstrate level of effort in email and phone outreach. The number of outgoing communications compared to incoming, and the meetings offered compared to those held, are included.

To show level of effort, the only logistical correspondence—like scheduling a meeting—included in the appendix is when a meeting was not scheduled or was postponed.

The Record of Consultation and Engagement for Government Agencies includes a summary of activities and information outlining the effort undertaken by the Project Team to consult and engage with municipal, federal, and provincial government agencies.

11.12 Issue Resolution

Issues have been considered and addressed / resolved (or partially resolved) where possible. Unaddressed issues are reflected in the Environmental Assessment / Impact Statement for the regulator's consideration including information on efforts made to address the issue even if attempts were unsuccessful. If issues are raised outside of the mandate of the Proponent, the Marten Falls-Ontario Memorandum of Understanding on Shared Consultation Responsibilities allows that these issues can be addressed by Ontario (Ministry of the Environment, Conservation and Parks and Ministry of Mines).

12. Our Changing Climate

Climate change presents many challenges for infrastructure projects, particularly in remote areas like Marten Falls. This section explores how climate change could affect the Community Access Road and outlines a series of strategies to make it safer and more resilient. Climate events such as increased rainfall, flooding, wildfire risks, extreme heat, and ecosystem shifts (for example, changes in vegetation patterns, loss of critical wildlife habitats, or shifts in species distributions) have the potential to affect both the construction and long-term use of the Community Access Road. If climate events result in the closure of the Community Access Road, they will also affect Marten Falls First Nation and potentially other communities that rely on it.

As the climate continues to change, it is important to consider strategies for making the Community Access Road resilient so that it remains operational. This section outlines proposed adaptations to protect the Community Access Road and its users, including enhancing drainage to manage flood risks, employing techniques to minimize wildfire impacts, and implementing safety measures for workers during heat waves. Building resilient infrastructure aims to promote the Community Access Road's long-term stability and the safety of the communities that rely on it.

12.1 Background and Approach to Addressing Climate Change Impacts

12.1.1 Greenhouse Gases and Climate Change

Greenhouse gases are gases that trap heat and regulate Earth's temperature. They allow sunlight to enter the atmosphere but prevent some of the heat generated by the sunlight from escaping back into space. This process is similar to how a greenhouse works, which is why they are called greenhouse gases. Greenhouse gases are essential for keeping the Earth warm; however, human activities have increased their concentration in the atmosphere, resulting in a changing climate.

Some common greenhouse gases include water vapour, carbon dioxide, methane, nitrous oxide, and ozone. Greenhouse gases can be both natural and human made. Natural greenhouse gases are produced by natural sources and processes, such as animals and humans breathing, decomposition of plants, and water evaporation. Greenhouse gases caused by human activities include the burning of fossil fuels (for example, when driving a car or heating a home) and methane emitted by livestock, such as cows, during digestion.

Climate change is a global issue that impacts every region, including Canada. Greenhouse gases trap heat in Earth's atmosphere, leading to changes in climate patterns that affect water, land, and people. These changes result in effects such as rising temperatures, changing rainfall patterns, and more frequent extreme weather events, all of which impact food security, health, biodiversity, and economic stability.

12.1.2 Understanding Climate and Weather

It is important to understand the difference between weather and climate, as these are often used interchangeably but have distinct meanings.

12.1.2.1 Weather

Weather refers to the atmospheric conditions experienced daily, such as temperature, precipitation, wind, and humidity. It changes from day to day and can even vary significantly within a single day.

12.1.2.2 Climate

Climate, on the other hand, refers to the average weather conditions over a much longer period, typically 30 years or more. Climate helps us understand broader trends and patterns, such as how much rain an area typically receives during certain months or how average temperatures vary from season to season.

When weather patterns change consistently over time, the climate changes, impacting both natural and human systems. For instance, warmer temperatures can lead to earlier snowmelt, affecting water availability in summer. Climate changes can also influence animal migration patterns, plant blooming times, and the timing of hunting and fishing activities—important for Indigenous communities that rely on natural cycles for cultural and economic practices.

12.1.2.3 Human Influence on Climate Change

The climate change experienced today is largely caused by human activity. For 5,000 years before Common Era, the global population has grown from approximately 5 million to over 8 billion by the end of 2024. This exponential growth has fuelled greater demand for energy, food, and resources. As the population has expanded, so has the use of fossil fuels such as gasoline, diesel, and coal, along with the conversion of forests into farmland, ranches, and urban areas.

These greenhouse gases are responsible for warming Earth's atmosphere and driving changes in global climate patterns. In Canada, these changes have led to more severe wildfires, reduced ice cover on lakes and rivers, and altered agricultural productivity. For example, near the Community Access Road, Marten Falls First Nation members reported that the Albany River water levels were so low during the summer of 2024 that they could cross it on foot. Marten Falls First Nation members also reported changes in animal species while trapping and noted changes to animal behaviour, which affected the timing of the annual moose hunt in 2024. Such shifts highlight the importance of assessing climate risks for any new project, such as the Community Access Road, and make sure that infrastructure is designed to withstand future conditions.

12.1.3 Addressing Climate Change Impacts

There are two main ways to address climate change impacts: mitigation and adaptation.

12.1.3.1 Mitigation

Mitigation involves reducing greenhouse gas emissions to lessen the severity of climate change (Intergovernmental Panel on Climate Change, 2021). This includes reducing the use of fossil fuels, transitioning to renewable energy, and improving energy efficiency across various sectors. The Community Access Road incorporates mitigation measures to minimize emissions from construction and maintenance activities, as discussed in **Section 9.5.4.2.2**. These measures include maintaining construction and maintenance equipment.

12.1.3.2 Adaptation

Adaptation involves preparing for and managing current expected and anticipated climate impacts. For the Community Access Road, this means designing infrastructure to withstand expected and anticipated climate change conditions, such as increased rainfall, higher temperatures, frequent freeze-thaw cycles, and heightened flooding risks. The goal is to construct a road that is resilient and minimizes risks to surrounding communities in a changing climate.

12.1.4 Leveraging an Indigenous Climate Lens

Including different perspectives, particularly those of Indigenous communities who live near the Community Access Road and have a deep connection to the land, is important for understanding climate change and its potential impacts. In 2019, the Project Team initiated a program to gather Indigenous Knowledge. Indigenous Knowledge is based on generations of observations and interactions with the environment. This knowledge is

deeply rooted in the culture and traditions of Indigenous communities and provides unique insights into environmental changes that may not be captured by conventional scientific data.

Marten Falls First Nation engaged with 22 Indigenous communities throughout the environmental assessment process. Six of these communities provided feedback on the climate change study or in other formats, including:

- Fort Albany First Nation;
- Kashechewan First Nation;
- Kitchenuhmaykoosib Inninuwug;
- Marten Falls First Nation;
- Wapekeka First Nation; and
- Weenusk First Nation.

These communities contributed their knowledge through climate change webinars, workshops, supplemental documents, and surveys. Knowledge Keepers from these communities shared observations of environmental changes, such as shifts in animal migration patterns, changes in fish populations, and variations in vegetation health. For instance, they reported that certain bird species, including waterfowl, are migrating earlier in the spring and leaving later in the fall. These shifts have direct impacts on hunting practices, which are vital for food security and cultural heritage.

Additionally, community members have noted changes in fish populations, particularly a decline in cold-water species. Warmer water temperatures, changes in stream flows, and habitat degradation are believed to be contributing to these declines. The loss of key fish species has implications for food security, as fish are an important source of nutrition for many Indigenous communities. Changes in vegetation have also been reported, with some native plant species becoming less common, while other, more heat-tolerant species are increasingly prevalent.

Indigenous Knowledge has also highlighted the broader effects of climate change and anticipated extreme weather events on community life. Warmer winters and shorter winter access road seasons have disrupted traditional travel routes, making it more difficult for community members to access hunting and fishing areas. During the 2023 / 2024 winter season, most winter access roads to northern communities, including Marten Falls, were not opened or only opened for light traffic (Stimpson, 2024). As such, northern Ontario First Nations declared a state of emergency over winter roads (Global News, 2024). These changes impact not only the physical environment but also the cultural and social aspects of community life, as traditional activities are central to cultural identity and community well-being.

By combining Indigenous Knowledge with scientific research, a more comprehensive understanding of climate impacts can be achieved, enabling the development of sustainable and culturally respectful solutions.

12.2 Observed and Predicted Changes

Research on climate change and the Indigenous Knowledge considered during this study indicate that the Community Access Road area will become warmer and wetter in the future. By the end of the century (2071 to 2100), average temperatures are expected to increase by approximately 6.2 degrees Celsius (Intergovernmental Panel on Climate Change, 2021). This will likely result in longer heatwaves, changes in plant life, and shifts in ecosystems.

The number of days with temperatures above 30 degrees Celsius is expected to rise from an average of 1.4 days per year to approximately 6 days. This increase in heat poses health risks, weakens construction materials, and reduces agricultural productivity. More heatwaves may cause heat stress for community members and workers, while also making infrastructure maintenance more difficult. Warmer temperatures during the winter will lead to an increase in freeze-thaw cycles. The number of mid-season days with temperatures above 0 degrees Celsius will increase from on average 14 days to 27 days per season.

Annual precipitation is expected to increase by approximately 17 percent, with more rain and slightly less snow. This increase could result in more frequent flooding, increased soil erosion, and extra stress on drainage systems. These changes may affect the Community Access Road by causing erosion and damaging bridges and culverts. Shifts in rainfall patterns will likely result in more extreme rainfall events and longer dry periods. Such dry periods in combination with higher temperatures will likely lead to more wildfires. The Community Access Road could, to an extent, act as a limiting factor and a potential fire break.

Climate change will also impact ecosystem services, which are natural processes that provide benefits such as clean water, fertile soil, and healthy fish populations (Intergovernmental Panel on Climate Change, 2021). With the Community Access Road, challenges related to shorter ice seasons will be reduced, making access to hunting and trapping areas more reliable. However, changes in rainfall and temperature may still affect soil stability, water availability, and overall ecosystem health. Warmer weather can lead to an increase in invasive pests that damage trees and other plants, harming forest health and biodiversity. Other climate-tracking species, including birds, fish, insects, mammals, trees, bushes and grasses, may potentially change the composition of the ecosystem.

Seasonal shifts may result in drier conditions at certain times of the year, impacting the availability and quality of water. Reduced water supply and quality can threaten food security by reducing the number of fish and other aquatic resources. Changes in plant growth patterns may also impact the availability of medicinal plants that are important for traditional health practices, further disrupting cultural activities.

These changes disrupt not only the ecological balance but also the cultural, social, and economic life of local communities. Furthermore, climate change will shift the start date of construction for the winter road to later dates. At the same time, the spring melt will result in earlier closures of the winter road. Additionally, mid-winter melting events are projected to reduce the internal stability and potential closure of the winter road.

Refer to the Climate Adaptation and Resiliency Technical Support Document (Appendix Y) for more detail.

12.3 Adapting the Project for Future Climate Conditions

To prepare the Community Access Road for challenges caused by future climate, a climate change risk assessment was conducted using the Public Infrastructure Engineering Vulnerability Committee High-Level Screening Guide (Public Infrastructure Engineering Vulnerability Committee Global Partnership, 2021). This guide provides a systematic approach to evaluating climate risks and planning appropriate adaptation strategies. Full details of the climate change risk assessment are included in the Climate Adaptation and Resiliency Technical Support Document (Appendix Y) and summarized in the following sections.

12.3.1 Climate Change Risk Assessment

The Public Infrastructure Engineering Vulnerability Committee High-Level Screening Guide is a qualitative risk assessment process designed to help organizations understand potential future climate impacts on a project during construction, operations, and potentially decommissioning. The climate change risk assessment utilizes the following four steps:

- **Scope:** The assets being constructed by the project, the time horizons, and the emission scenarios for the climate change risk assessment were determined. For this climate change risk assessment, two future time horizons (2041 to 2070 and 2071 to 2100) were considered to the historical time horizon (1981 to 2010) under the worst-case emission scenario of continued and unabated emissions of

greenhouse gases. The 2041 to 2070 time horizon includes construction and near-future operations, and the 2071 to 2100 time horizon captures far-future operations and potential decommissioning. The worst-case scenario, without international efforts to reduce emissions, constitutes a conservative approach that may overestimate the risk. The assessment considered the Community Access Road, any supporting ancillary infrastructure, and the people who will construct, operate, and maintain the road, along with its users.

- **Data:** The next step involved collecting data to support the assessment, associated with both the Community Access Road and climate. The Community Access Road was broken into components and sub-components (also referred to as elements) of a similar nature for consideration in the climate change risk assessment. The climate records included historical weather records, future climate projections, and insights from Indigenous Knowledge (for example, observed changes to fish populations). Climate data was sourced from Environment Canada's climate reports and assessments by the Intergovernmental Panel on Climate Change (Intergovernmental Panel on Climate Change, 2021). To determine the climate-related risks to the Community Access Road, climate indicators and their relative changes to the historical time horizon were analyzed to develop a likelihood from 1 to 5. The identification of components of the Community Access Road, selected project relevant climate indicators, and their associated likelihood were prepared for the next step of the climate change risk assessment.
- **Assessment:** To develop a risk score for the interaction between a climate indicator and a project component, an impact consequence rating table was developed. It considered the potential impact across five categories including health and safety, infrastructure integrity, operational impact, financial impact to Marten Falls First Nation, and financial impact to the road owner. Each of these categories had five increasing levels of impact to allow for a potential consequence score of 1 to 5. A risk score was developed for each possible interaction between climate indicators and project components by multiplying the climate likelihood and the selected consequence score. Some interactions were not scored as the project component is not exposed to a particular climate indicator. For example, rest stops are not exposed to extreme temperatures. Resulting risk scores, from 1 to 25, were then classified as low risk (risk score less than or equal to 9), moderate risk (risk score between 10 and 16) and high risk (risk score greater than or equal to 20). Those interactions that resulted in a risk score classified as moderate or high risk were moved to the reporting step to develop adaptation measures to reduce the risk score.

- **Reporting:** The final step involved developing adaptation measures for interactions classified as moderate or high risk. These measures are presented in detail in the Climate Adaptation and Resiliency Technical Support Document (Appendix Y), with a summary provided in **Table 12-1**.

Table 12-1: Summary of Adaptation Measures

Climate Indicator	Adaptation Measures	Project Phase
Extreme Temperature and Heat Wave	Implement an alert protocol designed to identify and communicate hot weather and heat wave conditions that could impact the well-being of community members, visitors, and workers.	Construction/ Operations
	Enforce breaks for workers during construction, provide protective equipment and air conditioning in camps, and implement flexible work schedules during heat waves.	Construction
	Communicate the health risks of extreme heat events to the public, as recommended by Health Canada (2011). For example, share heat wave warnings and health safety tips on display signs in construction camps and community buildings.	Construction/ Operations
	Provide designated cool, shaded, or air-conditioned areas for workers to limit their exposure to extreme temperatures and heat.	Construction
Extreme Rainfall	Design drainage systems to handle heavy rainfall, with well-defined overland flow routes.	Construction
	Choose oversized culverts to account for the increase in the recurrence of floods and extreme rainfall of about 172 millimetres (in other words, the 100-year rainfall in 2071 to 2100).	Construction
	Conduct frequent grading and maintenance of the road to fill potholes and maintain a smooth surface that can handle heavy rainfall more effectively.	Operations
	Communicate the condition of the road to the public to encourage people to be careful when traveling. For example, share the location and status of floods or road washouts in construction camps and in community buildings. Include the road in the internet feed for road conditions reporting.	Construction/ Operations
Wildfire	Conduct regular maintenance and inspection of the road to prevent the accumulation of flammable debris and improve safe travel.	Operations
	Implement early warning systems to prepare for wildfire events and make informed decisions about road closures.	Operations
	Develop and implement an emergency preparedness and management plan in the case of a wildfire event.	Operations
Thunderstorm	Establish a storm warning system that alerts road users in advance so that they can plan their travel.	Operations
	Establish guidelines on what to do in case of a thunderstorm and communicate to road users.	Operations

12.3.2 Future Climate

While developing the associated climate data and future climate projections in the vicinity of the Community Access Road to support the climate change risk assessment, two areas of additional research were completed and included in the Climate Adaptation and Resiliency Technical Support Document (Appendix Y). The first is presented in **Attachment C**: Climate Change Impacts on Ecosystems, which includes insights from Indigenous Knowledge. The second is presented in **Attachment D**: Future Usability of the Winter Road.

12.4 Conclusion

After implementing the identified adaptation measures, the negative effects of the climate change on the Community Access Road could be reduced. However, it is important to recognize that while these strategies greatly enhance the Community Access Road's resilience, they do not eliminate all risks.

13. Other Regulatory Requirements

13.1 Accidents and Malfunctions

One of the federal requirements that needs to be met is an assessment of potential accidents and malfunctions of the Community Access Road. This can include the failure of certain works or incidents involving road users caused by technological malfunctions, human error or extreme weather events (for example, flooding, earthquake, forest fire).

As described previously in the Environmental Assessment / Impact Statement, the main phases of the Community Access Road include planning, detail design, construction and operations. Good planning can help prevent and / or minimize the potential for accidents and malfunctions. In addition to this, construction-specific and operations-specific safety measures and plans will be developed to help reduce the potential of accidents and malfunctions and support damage control if and when one occurs.

This section provides information on:

- Potential accidents and malfunctions (construction and operations);
- Plans to reduce their likelihood of occurring and response plans if one were to happen (construction and operations);
- Feedback from Indigenous communities and the public relating to potential accidents and malfunctions associated with the Community Access Road; and
- Cultural awareness and sensitivity.

13.1.1 Potential Accidents and Malfunctions

Based on the Community Access Road design and intended use, professional judgement and experience with other remote road projects, potential accidents or malfunctions are listed in **Table 13-1**. These were considered for the construction and operations phases. The construction phase is anticipated to take between 3 to 10 years, while the operations phase is expected to be permanent. The construction and operations phases of the Community Access Road are distinct in terms of management and responsibilities, often involving different entities.

The hazard identification and risk assessment for the Community Access Road is covered in **Section 12.3**.

Table 13-1: Potential Accidents or Malfunctions

Potential Accident or Malfunction	Phase	General Description
Spill	Construction	• Accidental spill of hazardous material (for example, fuel, dust suppressant, explosives) during storage, handling, or dispensing, resulting in the release of hazardous material on soils, vegetation or near a waterbody. • Exposure to toxic substances: workers or first responders may be exposed to toxic fumes or substances during an accident involving hazardous waste. • Vehicle accident or mechanical malfunction involving construction equipment or trucks, resulting in the release of hazardous materials such as hydraulic fluid, fuel, or oil on soils, vegetation or near a waterbody.
Spill	Operations	• Transportation of hazardous material (for example, fuel) accidental spill. • Vehicle accident or mechanical malfunction, resulting in the release of hazardous materials such as hydraulic fluid, fuel, or oil on soils, vegetation or near a waterbody.
Explosion or Fire	Construction / Operations	• A fire or explosion within project infrastructure, resulting in the release of contaminants to the atmospheric, aquatic, or terrestrial environment • A fire or explosion within project infrastructure causing injury to people or the environment.
Transportation, Storage and Use of Explosives	Construction / Operations	• Accidental discharge of bulk explosive supplies (ammonium nitrate) during transportation or storage, resulting in the release of contaminants to the aquatic or terrestrial environment • Accidental detonation of explosives causing injury to people.
Transportation Accidents	Construction	• Traffic accident (vehicle collision or rollover) during transport of project supplies and workers from camp accommodations to construction sites causing injury to people.
Transportation Accidents	Operations	• Traffic accident (vehicle collision) involving Community Access Road users causing injury to people. • Traffic accident (vehicle-pedestrian collision).
Extreme Weather Event Resulting in Infrastructure Failure	Construction / Operations	• Extreme weather event (rainfall, snowfall) resulting in the failure of infrastructure (culvert washout, bridges damage) and creating unsafe conditions for people and the environment.
Wildlife Encounter	Construction / Operations	• Physical Injuries: workers can suffer bites, scratches, or stings from animals such as snakes, spiders, or bees. These injuries can lead to pain, swelling, infections, or allergic reactions. • Property Damage: wildlife can cause damage to construction sites. Animals like rodents may chew through electrical wires or insulation, leading to potential hazards and additional repair costs. • Zoonotic Diseases: certain wildlife species can transmit diseases to humans. For example, bats and raccoons can carry rabies, while ticks can transmit Lyme disease. • Traffic accident (vehicle-wildlife collision).

13.1.2 Plans

13.1.2.1 Construction

Given the length and complexity to construct the Community Access Road, it is expected that more than one construction company (the contractor) will be involved. Accidents can be prevented through good planning and design. Safety measures will also have to be implemented to support reducing the likelihood of an accident happening and controlling one efficiently if one were to occur. One of the requirements that the owner / operator selected for the Community Access Road will have to fulfill is the preparation and implementation of the plans related to accidents and malfunctions. The prime owner / operator will be responsible for drafting plans, while contractors will be responsible for reviewing and implementing these plans.

A list of potential plans is provided below for consideration. The final list will be confirmed once the ownership of the Community Access Road is determined.

- **Spill Contingency Plan:** its objective is to protect the public, the environment and workers by having a quick and effective action plan to minimize harm. It will outline the steps to be taken if hazardous materials (for example, fuel and engine oil) are spilled during construction. It usually includes what to do on: immediate response, notification, cleanup and prevention, as well as information on equipment;
- **Waste Management Plan:** its objective is to help protect the environment by promoting recycling and proper disposal, as well as keeping workers safe by managing hazardous waste appropriately. It will include details on how construction waste will be handled, strategies on waste separation (for example, recyclables and hazardous waste), collection and storage, disposal, recycling, and minimization / reduction;
- **Emergency Response Plan:** its objective is for everyone to know what to do in an emergency, with an emphasis placed on protecting lives and minimizing damage. It will outline the actions to be taken during various emergencies or accidents. It can include risk assessment, identification of potential hazards specific to the construction site, response procedures, communication protocols, and evacuation plans. The construction of the Community Access Road is anticipated to take between 3 and 10 years. It is possible that during that period extreme climate-related events could occur. As such the Emergency Response Plans, which the owner / operator prepares, will also include provisions on dealing with extreme weather events such as wildfires, flooding and winter

storms. The addition of these will not only consider the safety of construction staff and the public, but also the protection of the Community Access Road, impacts to the surrounding environment, and consider preventing additional accidents (for example, spills or explosions);

- **Explosives Management Plan:** explosives will be used at aggregate sites. Therefore, an Explosives Management Plan will be prepared. Its objective is to protect workers, the public, and members of Indigenous communities by having explosives be used safely and responsibly. It will include storage protocols and handling procedures. It will also include emergency procedures, which list steps to take in case of an accidental detonation or other emergencies involving explosives;
- **Wildlife Management Plan:** its objective is to protect both wildlife and workers by minimizing harmful interactions. It can include monitoring, such as regularly checking for wildlife activity near the construction site, deterrent measures to keep animals away from the construction area, and response procedures if wildlife is encountered, including safe relocation methods; and
- **Traffic Management Plan:** its objective is to keep construction workers safe by managing traffic effectively. It can include traffic control measures (for example, signage and barriers), detours, and road closures and communication.

13.1.2.2 Operations

As with construction, the severity and frequency of accidents can be managed during operations through good planning and appropriate maintenance. Planning incorporates local knowledge and participation in the design and maintenance for such things as:

- Anticipating wildlife movements to limit interactions with vehicles;
- Weather forecasting to caution travellers or to close the road during adverse weather events;
- Routine maintenance activities such as:
  - Grading and addition of new aggregate;
  - Pothole repairs;
  - Flood management (for example, ditching, culvert repairs, and vegetation management); and
  - Snow removal;
- Emergency response capacity and capability.

Maintenance operations involve additional considerations, such as:

- Having appropriate capital assets available and maintained, such as trucks, plows, graders, emergency response vehicles / equipment, and associated supplies; and
- Well-trained labour to perform maintenance operations, ideally labour resident in Marten Falls (note, this is a business development opportunity as well as an employment opportunity).

The Community Access Road will be designed in accordance with the Ontario Ministry of Transportation's Roadside Design Manual (Ontario Ministry of Transportation, 2023). In addition to following the Roadside Design Manual, the geometric design criteria used for the design and construction of the Community Access Road will be based on the latest and best practices from the Transportation Association of Canada and Ministry of Transportation of Ontario Design Supplement. The engineers are also considering including pull outs / rest areas at regular intervals.

The Community Access Road will require consideration of the following safety and traffic management protocols:

- **Emergency Response Plan:** it will outline procedures for responding to various emergencies, such as spills, wildfires, and vehicle accidents. Given the remote location of the Community Access Road, it will have to consider the viability of installing and maintaining SOS phones to allow for people to get in contact with emergency services. The Emergency Response Plan could also include coordination with local / regional emergency services, environmental agencies, and wildlife management authorities;
- **Incident Management Plan:** it will detail the steps to be taken in the event of incidents like culvert blowouts or wildlife collisions;
- **Traffic Management Plan:** it is assumed that the average annual daily traffic to Marten Falls will be 100 vehicles. As such it is not expected that neighbouring communities will see a change in traffic as a result. However, if the Community Access Road is in the future connected to the Northern Road Link, it is estimated that traffic could then increase to an average annual daily traffic of 700 vehicles along the north-south section. It is expected that the same entity will operate and maintain both roads and that a traffic plan will be prepared as part of their operations. Given the traffic-related concerns raised by Indigenous communities, it is recommended that the owner / operator work with Indigenous communities on the preparation of a traffic plan. It could include information on traffic control measures (for example, potential construction of a bypass, signage, and barriers), detours, road closures, and communication; and

- **Communication Protocols:** effective communication is essential during emergencies. These protocols aligns relevant parties, including emergency services, maintenance crews, the public, and Indigenous communities so that they are informed and coordinated during incidents. Given the remote location of the Community Access Road, the communications protocol will also have to consider how to allow users to report issues (for example, potholes, dead animals on the road, and car accidents) as well as how the operator can notify users of potential hazards ahead (for example, road maintenance, icy driving conditions, and road closures).

13.1.3 Engagement and Feedback

Marten Falls First Nation has been consulting and engaging with 22 Indigenous communities as well as the public and have received feedback on many topics. Indigenous communities and the public have also provided feedback to the Agency, and this is available on the Agency's registry. **Table 13-2** presents the feedback obtained on traffic, community safety, and impacts to humans, traditional subsistence, and cultural resources. It lists feedback directly sent to Marten Falls First Nation. At the time of writing this Environmental Assessment / Impact Statement, no feedback relating to accidents or malfunctions was listed on the Agency's registry. The following quotes are from Marten Falls First Nation community members.

> The first time building a road was mentioned one elder said to build it on hard ground, "not in the muskeg as it will be difficult to maintain it."
> — **Rosie Achneepineskum**

> We will need to monitor the all-season road for safety, security and maintenance purposes. Tracking vehicles by having a registration system at each access point would help people to know if a vehicle has arrived at their destination. Forest fire alert systems should be in place. A system for vehicles that break down or are involved in accidents. Random checks for illegal substances may also be necessary. — **Sandra Moonias**

> Monitoring wildlife and natural issues of concern (for example, flooding, fallen trees, snowdrifts and plans) for dealing with these issues need to be made. A mechanic should be accessible when necessary. Road maintenance crews should be available. The need to remove a dead moose or bear struck by a vehicle will be necessary at times and a plan should be made for this. In the past, Marten Falls First Nation community members used the trail radio system to communicate. This could be used or satellite phones for emergencies. Passing lanes and turning around areas for vehicles in case of a wildfire, flooding, etc. — **Sandra Moonias**

Table 13-2: Summary of Engagement Feedback Received by Marten Falls First Nation

Comment	Source	Response
Representatives noted that the community is already dealing with a lot of mining traffic and there was a fear that this Project could make said traffic worse.	Animbiigoo-Zaagi'igan Anishinaabek First Nation	Roadside safety is of paramount importance. The Community Access Road will be designed in accordance with the Ministry of Transportation Ontario's Roadside Design Manual. In addition to the manual, the geometric design criteria used for the design and construction of the Community Access Road will be based on the latest best practices from the Transportation Association of Canada and Ministry of Transportation Ontario's Design Supplement. The designers are also looking at including elements from the Ministry of Transportation Ontario's 2+1 Roadway Site Selection and Design Parameters report, which may include truck passing lanes and pull outs / turnouts along the route (Ministry of Transportation Ontario, 2021).
Communication highlighted several concerns they believed the Community Access Road may have on community safety. In summary, these concerns were related to road safety as there will be the potential for more vehicle collisions due to increased vehicles on the roads and personal safety, especially as it relates to women and girls, as well as to two-spirit, lesbian, gay, bisexual, transgender, queer, intersex, and additional people who identify as part of sexual and gender-diverse communities citizens.	Métis Nation of Ontario	Potential impacts will be evaluated, as required, and mitigation and monitoring programs will be proposed through the Environmental Assessment / Impact Statement (Community Well-Being Technical Support Document; **Appendix T**).
A member raised safety concerns related to future truck activity on the Community Access Road including dust, noise, low visibility, and speeding.	Marten Falls First Nation	Provisions for dust suppression on account of truck traffic are being included and therefore the width is 11 metres. Dust suppressant products are being examined that are acceptable to both the environment and have been proven to work. Noise controls may be exercised in populated areas (for example, braking).
Concerns expressed about road safety (rest areas along the way equipped for survival).	Aroland First Nation	Concerns were noted and will be considered during detail design.
Concern that the Project could cause an increase in traffic and more non-Indigenous harvesters into the area impacting traditional resources.	Kashechewan First Nation	Concerns were noted and incorporated into the Kashechewan Aboriginal and / or Treaty Rights and Interests: Assessment Report. The following mitigation measures is noted in Appendix U when referring to the future owner/operator: The Proponent will discuss possible restrictions for hunting in the Project Area with the Ministry of Natural Resources.

13.1.4 Cultural Awareness and Sensitivity

As discussed in **Section 1**, colonialization, government policies, residential schools, and the incursion of newcomers, among many other factors, have had a devastating impact on the Anishinaabeg. The Indigenous communities in the area are working towards strengthening their communities and culture, salvaging their teachings and knowledge, and improving their lives.

Generally, accidents and malfunctions relate to technical aspects of a project (**Table 13-1**). However, the lack of an appropriate plan to support Indigenous communities and non-Indigenous workers in their interactions could also be considered as a potential accident and malfunction to the Anishinaabeg culture. Some examples include:

- **Disruption of Sacred Sites:** respecting and recognizing sacred Indigenous sites in construction projects helps preserve these important areas, fostering cultural and spiritual well-being for Indigenous communities and promoting harmonious progress without conflicts or delays;
- **Environmental Damage:** incorporating traditional ecological knowledge into design and maintenance plans can limit adverse disruption to ecosystems valued by the Indigenous community. This protects access to valued Indigenous activities such as hunting, trapping, and medicine gathering; and
- **Cultural Misunderstandings:** proactive Cultural Awareness training for workers can avoid misunderstandings and conflicts. For example, workers with cultural awareness training will more likely respect local customs and sensitivities.

During construction the owner / operator will be required to provide mandatory, ongoing cultural awareness and sensitivity training to protect the Anishinaabeg, with guidance and support from Marten Falls First Nation. The training should be developed with the communities so that opening roads to the north does not result in further damage but can be used to build trust and understanding and protect the Anishinaabeg culture among others. The ongoing aspect of the training and exposure to the Anishinaabeg culture will better support non-Indigenous workers deepen their understanding.

13.1.4.1 Potential Mitigation Measures

During construction the owner / operator will be encouraged to consider the following cultural sensitivity / awareness plans and prepare / implement them as applicable:

- **Community Engagement and Consultation:** this should include early and ongoing engagement with Indigenous communities including the establishment of feedback mechanisms. This should also include checking on culturally appropriate communication methods and traditional protocols;

- **Cultural Competency Training:** this could include training programs, workshops and seminars. This could include training for all project staff on Indigenous cultures, histories, and contemporary issues to deepen understanding and sensitivity;
- **Cultural Protocols and Practices:** this could consider integrating cultural practices and ceremonies into project milestones where appropriate (for example, a ground-breaking ceremony or Pow Wow). It could also consider working with communities to identify opportunities for workers to attend cultural events;
- **Health and Safety Considerations:** this could include the development of safety protocols that consider cultural practices and community needs;
- **Monitoring and Reporting:** to confirm the plan is working adequately, regular monitoring by a qualified individual should be completed for compliance with cultural sensitivity commitments. In addition to this, making reports on progress and any issues accessible to Indigenous communities will foster transparency and help strengthen relationships;
- **Local Road Board:** could be established, using the Ontario *Local Roads Board Act* as a framework with representatives of Marten Falls First Nation as part of it (Government of Ontario, 1990e). It could include responsibility for the construction and operations of the Community Access Road, as well as for levying taxes to fund these activities and enter into agreements with other road-related project entities;
- **Anti-human Trafficking Plan:** should include training for employees and Marten Falls First Nation members to recognize and report signs of trafficking. Additionally, the plan could consider establishing a reporting mechanism for suspected trafficking incidents and provide support for victims. The plan should be developed with the collaboration of Marten Falls First Nation and local law enforcement to monitor and address trafficking risks. The plan should also be regularly reviewed so that it remains effective and that it is updated as needed;
- **Culturally Appropriate Reporting System:** consider establishing an easy-to-use and culturally sensitive reporting system. This system should be developed in collaboration with Indigenous communities to confirm it respects traditional protocols and communication methods;
- **Community Support and Engagement:** work with communities to identify ways in which to support community members overcome apprehension about reporting, making them feel comfortable and heard. This could include regular community meetings and feedback sessions to build trust and transparency;

- **Incident Response Team:** it is important for the incident response team to be well-trained in cultural sensitivity. This team should include representatives from Indigenous communities so that responses are appropriate and respectful;
- **Immediate and Long-term Support:** offer immediate support to those affected by incidents, such as counseling services and community support programs. Additionally, consider developing long-term support plans to address ongoing impacts of incidents;
- **Investigation Process:** reported incidents should be investigated thoroughly and transparently, and in a timely manner. Findings should be shared with the affected communities and involve them in the resolution process;
- **Continuous Improvement:** the response plan should be reviewed regularly. Feedback from Indigenous communities and lessons learned from past incidents should be used to update it, as appropriate;
- **Training and Awareness:** ongoing training on how to handle cultural sensitivity incidents; and
- **Documentation and Reporting:** detailed records of incidents and the actions taken in response should be well documented. Regularly report on these incidents to Indigenous communities to maintain transparency and accountability is highly recommended.

13.2 Meeting Canada's Environmental Obligations and Climate Change Commitments

The Tailored Impact Statement Guidelines (Impact Assessment Agency of Canada. 2020) require information on how the Community Access Road may contribute to Canada's ability to meet its environmental obligations and commitments.

- Currently many goods, including fuel, are transported to Marten Falls via the winter access road for a few weeks of the year and via air during the other remaining months. The Community Access Road will allow for easy access year-round.

> Road access will benefit people with cost of living, transportation for people to come in and out. Perhaps create more jobs for people in the long run. Would like to see solar system in place for certain things, for example greenhouses grow our own vegetables, heat. — **Norma Achneepineskum**

- Measures contemplated in the construction and design of the Community Access Road to limit its climate change impacts include the following:
  - There are sections of the road that will be on peatlands. Leaving these in place to avoid releasing carbon stored in the peatlands will be considered;
  - Requiring that equipment used during construction and operations are well maintained; and
  - Providing transportation to construction workers between construction camps and sites.
- The Tailored Impact Statement Guidelines identify federal environmental obligations that may be relevant to the Community Access Road. How these obligations were considered is described below:
  - The Ungulates Technical Support Document notes that caribou are listed as Threatened on Schedule 1 of the *Species at Risk Act* (**Appendix M**) (Government of Canada, 2024b). Mitigation measures were identified and described to lessen potential adverse effects, including maintaining consistency with any applicable recovery strategy, action plan, or management plan;
  - Eight Species at Risk were identified with the potential to occur within the wildlife Local Study Areas (Wildlife Technical Support Document; **Appendix K**). The Wildlife Technical Support Document describes mitigation measures that align with federal provincial recovery, management, or action plans and strategies. Required timing windows to avoid tree removals during sensitive timing windows will be respected during construction;
  - One fish Species of Conservation Concern, Lake Sturgeon, was identified as having potential to occur within the fish and fish habitat Local and Regional Study Areas (Fish and Fish Habitat Technical Support Document; **Appendix G**). Where feasible, areas of sensitive fish habitat and restricted activity timing windows will be avoided;
  - Sixteen bird Species at Risk were identified with potential to occur within in the birds Local and Regional Study Areas (Birds Technical Support Document; **Appendix L**). The *Migratory Bird Convention Act* nesting season (April 28 to August 14) will be considered, so construction clearing activities will occur between August 15 and April 27, where possible (Government of Canada, 2017c). If vegetation clearing is required during the migratory bird nesting season, non-intrusive pre-clearing nest surveys will occur within 7 days prior to clearing; and

  - One plant Species at Risk, Pitcher's Thistle (gaachiichiyaag waabigwanii), has the potential to occur within the vegetation Local Study Area (Vegetation Technical Support Document; **Appendix J**). Habitat description provided in the Recovery Strategy for Pitcher's Thistle (Cirsium pitcheri) in Canada (Parks Canada Agency, 2011) to characterize the suitability of all ecosites mapped within the vegetation Local Study Area was used (Vegetation Technical Support Document).

- Ontario's approach to have ecosystem representation within its network of protected areas uses the Landform / Vegetation Association as a surrogate for biodiversity. A Preliminary Biodiversity Offset Plan has been developed and is included in **Appendix AB** of the Final Environmental Assessment / Impact Statement. The specific approach will be determined through consultation with Environment and Climate Change Canada; Ontario Ministry of the Conservation, Environment and Parks; and Ontario Ministry of Natural Resources.

13.3 Contributions to Sustainability

Another requirement under the Tailored Impact Statement Guidelines is the inclusion of a project's contributions to sustainability. The Assessment Process is a tool to check the sustainability of projects. The three principles of sustainability are environmental sustainability, social sustainability, and economic sustainability. As part of the analysis, potential mitigation measures are used to attempt to balance environmental impacts against development / social gains. During the route selection process, the Community Access Road prioritized environmental sustainability by analyzing data collected in the water and land categories. This analysis confirmed that the Preferred Route for each of the three segments were those that had the least impact on the environment compared to other options. Environmental sustainability was a key consideration throughout, influencing not only the Preferred Route selection but also the development of mitigation measures and monitoring activities.

The main purpose for the Community Access Road is to provide opportunities to future generations of Marten Falls First Nation and to make the Community sustainable. The Community Access Road will support social and economic sustainability for Marten Falls First Nation. As mentioned in **Section 2**, the Community Access Road will make travel safer and lower the cost of food, fuel, and other supplies. It will also improve community services like health, education and wellness, and open up new opportunities for the Community to grow. The Community Access Road will make a positive contribution to Marten Falls First Nation' social interaction, as the community members will be able to travel in and out of the Community to visit relatives living inside and

outside of Marten Falls. In addition to these benefits, the Community Access Road can also be used by others like other Indigenous communities, mining, forestry, and tourism. The Community Access Road can create jobs during construction, maintenance, and operations. It will improve the Community's access to employment opportunities because people would be able to reliably commute to work year-round.

Beyond these benefits, the Community Access Road is more than an infrastructure development; it is a lifeline for the Marten Falls First Nation community, supporting its long-term sustainability and resiliency. Rooted in the principles of mino-bimaadiziwin (living a good life) and the Seven Grandfathers teachings, the Project emphasizes respect for all of Creation and the importance of living a balanced and healthy life. By integrating these teachings, the Project fosters a connection between infrastructure development and cultural values, so that future generations can thrive in harmony with the environment.

By improving access to essential services such as healthcare, education, and employment, the Project addresses critical socio-community challenges. It enhances public safety, particularly for children and Elders, while preserving traditional practices and access to traditional food sources. The Project also aims to reduce strain on public finances and improve housing options, fostering a healthier and more sustainable community. By promoting local work force participation and providing training opportunities, the Community Access Road seeks to empower the Community, creating lasting positive impacts. These benefits contribute to the Community's ability to thrive and adapt to future challenges.

The Project will contribute to sustainability by:

- Requiring the owner / operator to consider sustainable materials (in other words, materials that are recycled, recyclable, or sustainably sourced), and implement energy efficient construction practices and technologies, where practicable;
- Requiring the owner / operator to minimize construction waste, which includes recycling materials and reducing the amount of waste sent to landfills, and reduce water consumption by implementing rainwater harvest and greywater recycling systems, where practicable; and
- Integrating Indigenous teachings, such as mino-bimaadiziwin (living a good life) and the Seven Grandfathers teachings, to guide sustainable decision-making and promote a balanced and respectful relationship with the environment.

14. Monitoring Programs and Future Commitments

The Environmental Assessment / Impact Statement must include information on monitoring programs and future commitments to comply with both federal and provincial requirements.

Monitoring programs are important because they allow regulators, Indigenous communities and specialists to verify that the mitigations and predicted results described in the effects assessment are working as expected. They can also be used to identify potential changes or new and unexpected consequences of those mitigations. This is important as it allows the road operators to make adjustments to mitigation approaches, so they remain effective and that enhancement measures work as intended. Where the approaches are not working it allows for the opportunity to develop updated mitigations or enhancement measures.

Monitoring programs also include future commitments related to mitigating residual effects. A Project-specific environmental monitoring program will be developed during detail design and will include the monitoring commitments related to the various valued components.

Section 9 of each Technical Support Document in Appendix F to Appendix V include detailed information on monitoring programs to be conducted during pre-construction, construction and operations; as well as future commitments. **Appendix AA** includes a compilation of monitoring programs, and mitigation and enhancement measures.

14.1 Pre-Construction Monitoring Programs

Pre-construction is also referred to as detail design, and within these sections, these terms are used interchangeably. During detail design the route and temporary and permanent associated infrastructure will be further refined, and environmental permits and approvals will be obtained for both construction and operations of the Community Access Road. More information on the details noted in the sections below can be found in the respective discipline's Technical Support Document in the appendices of the Environmental Assessment / Impact Statement.

14.1.1 Water

14.1.1.1 Surface Water

Prior to construction, the following monitoring programs will be required:

- Surface water surveys using methods for ground-based surveys (during high and low stream flow conditions, where possible) at any waterbody crossing location that has not already been assessed as part of the field investigations and at water crossings where work is proposed below the high-water mark to meet additional permitting requirements; and
- If new waterbodies are identified, an Aquatics Specialist will be required to assess the new waterbody. Depending on the nature of the waterbody, recommendations for construction methods, appropriate mitigation measures, and permitting requirements will be made by the Aquatics Specialist and, when necessary, local First Nation communities and appropriate regulatory agencies including Fisheries and Oceans Canada and Ministry of Natural Resources will be engaged. This will allow for the appropriate mitigation measures to be implemented during construction at each waterbody crossing at a site-specific level, which will reduce or avoid potential effects on surface water quantity, surface water quality and sediment quality.

During detail design, site-specific surface water surveys will be complete to support engineering and permitting at waterbody crossings where work below high-water mark is proposed. Submit designs of waterbody crossings as required for permit applications to Fisheries and Oceans Canada and Ministry of Natural Resources.

14.1.1.2 Fish and Fish Habitat

Prior to construction, the following monitoring programs will be required:

- Fish and fish habitat and surface water surveys methods will be conducted before construction at any waterbody that has not been assessed and work is proposed below the high-water mark to meet permitting requirements (in other words, for the Fisheries and Oceans Canada Request for Review under the *Fisheries Act* and for permit applications to the Ministry of Natural Resources under the *Lakes and Rivers Improvement Act*); and
- If new waterbodies are identified prior to construction, an Aquatics Specialist will assess the waterbody. Depending on the nature of the waterbody, recommendations for construction methods, appropriate mitigation and

enhancement measures, and permitting requirements will be made by the Aquatics Specialist and, when necessary, local First Nation communities and appropriate regulatory agencies including Fisheries and Oceans Canada and the Ministry of Natural Resources, will be engaged. This will allow for the appropriate mitigation and enhancement measures to be implemented during construction at each waterbody crossing at a site-specific level, which will reduce or avoid potential effects on habitat quantity and quality.

14.1.1.3 Groundwater and Geochemistry

Prior to construction, the following monitoring programs are recommended. Specific details of the monitoring will be confirmed by and directed by a qualified person retained for environmental monitoring of the Project.

A groundwater monitoring program to establish baseline groundwater levels and quality. Groundwater levels and quality will be monitored as follows:

- Groundwater monitoring stations will be established at areas where large groundwater takings are expected or where potential for impacts on groundwater quality exists, such as pits, quarries, temporary construction camps, laydown yards, road constructed over peatland, and large structure foundations or road cuts / fills;
- The groundwater monitoring stations will be located between the anticipated work area and nearby receptors such as wetlands, waterbodies, and seeps / springs. Multiple groundwater monitoring stations may be required at larger sites to assess effects on various or large receptors and the groundwater monitors should provide depth coverage to at least the expected water taking depth;
- Groundwater levels will be measured at the monitoring stations at least monthly for 3 months prior to beginning groundwater taking. For pits and quarries which will be extracted below the water table under an Ontario *Aggregate Resources Act* permit, the groundwater monitoring program will be designed in accordance with the Aggregate Resources of Ontario: Technical Reports and Information Standards (Government of Ontario, 2023c) in addition to the Project monitoring program;
- Groundwater quality will be sampled at the monitoring stations at least monthly for 3 months prior to beginning construction work. The groundwater quality samples should be analyzed for general water quality parameters at minimum (such as., pH, temperature, conductivity, hardness, alkalinity, chloride, nitrate, nitrite, sulphate, phosphate, ammonia, total dissolved solids, dissolved organic

carbon, calcium, copper, iron, magnesium, manganese, potassium, sodium, and zinc). Sampling for metal parameters will include both dissolved and total concentrations to assess the influence of suspended solids on the concentrations. Additional parameters of concern should also be sampled for where identified, for example sampling for volatile organic compounds near areas where fuel or chemical storage is located; and

- In addition to the above recommended pre-construction monitoring, at sites where construction activities will require permitting for dewatering and water management such as Permit to Take Water, Environmental Activity and Sector Registry, and / or Environmental Compliance Approvals, the groundwater monitoring will be enhanced on a site-by-site basis to support the required permitting studies.

A geochemical testing and monitoring program to assess the potential for acid rock drainage from any soils, or bedrock, which will be exposed during construction. As part of this monitoring program:

- Acid base accounting analysis will be carried out and materials assessed for acid rock drainage potential based on the classification as outlined in Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials (Price, 2009).

Marten Falls First Nation has also noted interest in highlighting the importance of combining western science hydrology and Indigenous Knowledge (Marten Falls First Nation, 2023e). The Community noted that relevant Indigenous Knowledge provided by Marten Falls First Nation may be integrated into the groundwater monitoring program to provide a holistic approach to the Project's monitoring activities. To further this goal, Indigenous Environmental Monitors will be included in the monitoring program.

14.1.1.4 Peatlands

During detail design, the following tasks will be undertaken to minimize effects on peatland ecosystems:

- Refine peatland community mapping and field-verify the locations of sensitive or difficult to restore communities (such as fens and bogs) to inform the micro-siting of temporary access roads, staging areas, camps, debris and / or timber stockpiles, as well as the centreline of the Community Access Road within the 100 metre cleared right-of-way;

- Complete an assessment of pit / quarry locations to identify potential effects due to changes in hydrogeology / hydrology on peatland communities within the radius of influence for dewatering programs;
- Airborne Electromagnetic Surveying to produce continuous peat depth mapping. which is critical for construction planning such as identifying saturated or sensitive areas that may require specialized engineering solutions.

In addition, the following pre-construction monitoring programs and additional studies will be developed and initiated:

- A peatlands groundwater monitoring and water budget study will be developed and implemented during detail design to determine groundwater flow and influence on peatland ecosystems. This will further inform the assessment of the potential Project impacts on peatland ecosystems and the associated mitigation recommendations that will be confirmed and refined at detail design.
- A program designed to monitor groundwater on both sides of the Community Access Road and in areas of dewatering programs to establish pre-construction groundwater levels, as well as monitor groundwater levels during construction and post-construction. This program will include pre-construction, construction, and post-construction components. This also includes the creation of a monitoring program to include further geochemical testing on exposed bedrock and soils and determine the potential for acid rock drainage and / or metal leaching as it relates to methylmercury production in peatland communities present within the Construction Disturbance Area. The program will also monitor potential increases in methylmercury production related to changes in groundwater levels as a result of the construction of the Community Access Road. At a minimum, the program will include the following activities. Monitoring requirements will be further developed during detail design.
- Locations of groundwater monitoring instruments (such as piezometers) will be established approximately every 1,000 metres along sections of the road that will be constructed with the “floating road” construction methodology. Details of the monitoring plan including the final placement of piezometers and the duration of monitoring will be developed and refined during detail design.
- Monitoring locations will be established both up- and down-gradient of the future road to capture pre-construction, construction, and post-construction groundwater levels and movement patterns. Monitoring locations should be located away from equalization culverts.
- Monitoring will occur three times annually (spring, summer, fall).

- In addition to the pre-construction surface water monitoring programs specified in the Surface Water Technical Support Document (**Appendix F**), a pre-construction peatlands hydrological monitoring and water budget study will be developed and implemented. This will further inform the assessment of potential Project impacts on peatlands and the associated recommended mitigation measures (such as the culvert size and locations) that will be confirmed at detail design.

During detail design, the following activities will be completed:

- Complete an assessment of pit / quarry locations to identify potential effects due to changes in hydrogeology / hydrology on peatland communities within the radius of influence for dewatering programs.
- Prepare a Vegetation Restoration Plan that includes measures specific to peatland communities and peatland restoration, including peat stockpile management. This plan will be developed through engagement and consultation with Indigenous communities and integration of local Indigenous Knowledge and stewardship protocols.
- Implement a program designed to monitor groundwater on both sides of the Community Access Road and in areas of dewatering programs to establish pre-construction groundwater levels, as well as monitor groundwater levels during and post-construction.
- Develop a pre-construction peatlands hydrological monitoring and water budget study to further inform the assessment of potential Project impacts on peatlands and the associated recommended mitigation measures (such as culvert size and locations) that will be confirmed at detail design.

14.1.2 Land

14.1.2.1 Vegetation

During detail design, the following tasks will be undertaken to minimize effects on vegetation valued components:

- Refine vegetation community mapping and field-verify the locations of sensitive or difficult to restore vegetation communities (for example, organic wetlands) to inform the micro-siting of temporary access roads, staging areas, camps, debris and / or timber stockpiles, as well as the centreline of the Community Access Road within the 100-metre cleared right-of-way;

- Collaborate with the design team during the micro-siting of temporary access roads, staging areas, camps, and debris and / or timber stockpiles to minimize effects on known Traditional Use Plant harvesting areas, where possible;
- Reassess the status of Black Ash protection. If Schedule 1 of Ontario Regulation 6/24 has been updated to include the Construction Disturbance Area, a search for Black Ash trees will be completed at the Ogoki River crossing. Other suitable habitat in the south portion of the Construction Disturbance Area may also need to be searched. The scope of this additional assessment will be determined in consultation with regulatory agencies. If Black Ash trees are anticipated to be affected by the Project, regulatory agencies (Ministry of the Environment, Conservation and Parks, Environment and Climate Change Canada) will be consulted on next steps; and
- Complete an assessment of pit / quarry locations to identify potential effects due to changes in hydrogeology / hydrology on vegetation communities within the radius of influence for dewatering programs.

In addition, the following pre-construction monitoring programs and additional studies will be developed and initiated:

- A peatlands groundwater monitoring and water budget study will be developed and implemented during detail design to determine groundwater flow and influence on peatland ecosystems (a component of wetland ecosystems). This will further inform the assessment of the potential Project impacts on wetland ecosystems and the associated mitigation recommendations that will be confirmed and refined at detail design;
- Airborne Electromagnetic Surveying to produce continuous peat depth mapping which is critical for construction planning such as identifying saturated or sensitive areas that may require specialized engineering solutions;
- A program designed to monitor groundwater on both sides of the Community Access Road and in areas of dewatering programs to establish pre-construction groundwater levels, as well as monitor groundwater levels during construction and post-construction. This program will include pre-construction, construction, and post-construction components;
- Locations of groundwater monitoring instruments (for example, piezometers), will be also determined in consultation with vegetation ecologists and Indigenous communities so that effects on vegetation valued components are considered when determining their placement;

- Any programs as identified in the Peatlands Technical Support Document (**Appendix I**);
- In addition, a Vegetation Restoration Plan will be developed at detail design. This plan will include measures that are specific to peatland communities and peatland restoration, including peat stockpile management. This plan will be developed through engagement and consultation with Indigenous communities and integration of local Indigenous Knowledge and stewardship protocols; and
- Additional consultation with Ontario Parks will be completed at the detail design stage to determine permitting, mitigation and / or compensation or offsetting expectations for direct impacts to the Albany River Provincial Park and impacts to Critical Landform / Vegetation Associations.

14.1.2.2 Wildlife

Baseline data collected from existing conditions wildlife field program completed between 2019 to 2023, are expected to be adequate for pre-construction monitoring of all wildlife valued components except for beavers. Due to the importance of beavers to Indigenous communities and the uncertainty with respect to the effect of the Project on populations of furbearers and the fact that there are gaps in the existing conditions data, an additional aerial survey for active beaver lodges will be completed throughout the effects assessment Local Study Area to complement existing conditions data and refine the baseline characterization of beaver distribution. Pre-construction existing conditions for beaver can then be compared to post- construction conditions using the same survey approach.

Should the initiation of construction be delayed for an extended period of time (for example, five or more years), additional baseline monitoring may be required to update an assessment of adverse effects during the *Endangered Species Act* authorization process.

14.1.2.3 Birds

- Baseline data collected for breeding birds and marsh birds during point count and autonomous recording unit surveys from 2018 to 2022 are assumed to be adequate for pre-construction monitoring; and
- Additional pre-construction monitoring has been proposed, including the following program:
  - Pileated woodpecker habitat assessments, including an evaluation based on aerial interpretation and ground-truthed ahead of pre-clearing activities. These assessments are meant to keep project activities in compliance with the *Migratory*

Birds Convention Act (Government of Canada, 1994), specifically identified under the Migratory Birds Regulations in reference to pileated woodpecker. Pileated Woodpecker assessments will be completed in advance of the Project commencing construction, factoring in requirements for nest monitoring per Environment and Climate Change Canada guidance (for example, monitoring potential pileated woodpecker nest cavity trees for a period of 3 years).

14.1.2.4 Ungulates

Additional pre-construction monitoring for ungulates is not required. Baseline data collected from caribou collaring in 2021 to 2025, caribou and moose winter aerial surveys in 2022 to 2023, and remote camera monitoring surveys from 2021 to 2023, in addition to baseline data collected from caribou collared by Ministry of Natural Resources and for the Webequie Supply Road and Northern Road Link, are expected to be adequate to inform baseline conditions of ungulates.

Should the initiation of construction be delayed for an extended period of time (for example, five or more years), additional baseline monitoring may be required to update an assessment of adverse effects during the Endangered Species Act authorization process.

14.1.2.5 Physiography, Terrain, and Soils

During detail design, the following activities will be completed:

- The Soil Management Plan will be developed and followed for construction and operations;
- Develop and implement a geochemical testing and monitoring program to assess the potential for acid rock drainage from any soils, or bedrock, which will be exposed during aggregate extraction;
- Develop and implement a Spill Prevention and Emergency Response Plan;
- Develop and implement a Blasting and Communication Management Plan;
- Work with the Ministry of Transportation, and the Northern Road Link and Webequie Supply Road Project Teams to develop a coordinated approach to permafrost assessment; and
- Develop and follow recommendations outlined in a Permafrost Management Plan.

14.1.3 People

14.1.3.1 Aboriginal and / or Treaty Rights and Interests

The following Aboriginal and / or Treaty Rights and Interests-specific mitigation measures are proposed and must be confirmed with relevant parties, including Marten Falls First Nation and the province:

- Collaboration with local existing environmental advisory committees to support the development and implementation of all environmental monitoring programs. The objective is to include Indigenous interests and perspectives, particularly concerning resources utilized for rights-based purposes. In the absence of an existing advisory committee with an aligned mandate to Marten Falls First Nation, a Terms of Reference between relevant agencies and Indigenous communities will be established; and
- Collaborate with Indigenous communities to further weave Indigenous Knowledge into the current understanding of existing conditions. It is anticipated the Indigenous Knowledge could include wildlife observations, movement, migration routes, seasonal ranges, and fish health.

14.1.3.2 Acoustic and Vibration Environment

- Develop a Construction Vibration Workplan prior to the start of construction describing the construction schedule, list of construction equipment, list of point of reception locations (such as, traditional land use, residential, heritage structures and utilities), applicable guidance documents including criteria and control measures.

14.1.3.3 Cultural Heritage

- Research and evaluate the potential Mid-Albany Cultural Heritage Landscape and its associated potential heritage attributes for Cultural Heritage Value or Interest and level of significance. The research and evaluation should be completed by a qualified person(s) and recorded in a Cultural Heritage Evaluation Report;
- The Cultural Heritage Evaluation Report will use Ontario Regulation 9/06 or Ontario Regulation 10/06 of the *Ontario Heritage Act* to evaluate for Cultural Heritage Value or Interest of the potential cultural heritage landscape in accordance with the Ontario *Heritage Act* and the Ontario Standards and Guidelines for Conservation of Provincial Heritage Properties. Should any portions of the Local Study Area be found to have

provincial heritage significance under Ontario Regulation 10/06, additional work may require Minister's Consent, as defined in Section 3 of the Ontario *Heritage Act*; and

- If the potential cultural heritage landscape is determined to meet the criteria of either Ontario Regulation 9/06 or Ontario Regulation 10/06 of the Ontario *Heritage Act,* and continues to be adversely impacted by the Project, it is recommended that a Heritage Impact Assessment be prepared to fully assess impacts, including long-term residual effects, and propose mitigation measures to conserve the Cultural Heritage Value or Interest of the cultural heritage landscape.

14.1.3.4 Archaeology

- A Stage 2 Archaeological Assessment is required on the areas identified as having archaeological potential in the Stage 1 Archaeological Assessments;
- Any areas identified as having archaeological potential in the future Stage 2 Archaeological Assessment must complete a Stage 3 or Stage 4 Archaeological Assessment;
- Based on the findings of the partial Stage 2 Archaeological Assessment, a Stage 3 Archaeological Assessment is required at the Caviar (EiIp-1) site;
- The Stage 2 archaeological assessment must be conducted by a licensed archaeologist and must follow the requirements set out in Section 2.1.5 of the Standards and Guidelines for Consultant Archaeologists (Government of Ontario, 2011) for special survey conditions in northern Ontario and on Canadian Shield terrain;
- Test pit survey is required at 5 metre intervals in areas that fall within 50 metres of an identified modern water source. Survey is not required beyond 50 metres of this type of feature of archaeological potential;
- Where areas of archaeological potential include land adjacent to historic water sources (such as, glacial shorelines), or other areas identified as having archaeological potential based on the results of the Stage 1 archaeological assessment including the Aboriginal knowledge information, test pits will be placed at a maximum of 5 metre intervals between 0 and 50 metre from the feature, and at 10 metre intervals between 50 and 150 metre from the feature. Survey is not required beyond 150 metres of the archaeological features; and
- Poorly drained areas and areas of steep slope are to be mapped and photographed.

Archaeological investigations have the potential to reveal buried human remains. Should human remains be identified during any stage of work, the Proponent will be

informed immediately, and all archaeological work will halt until the proper authorities have been notified and permission to resume work has been granted, if required.

14.1.3.5 Atmospheric and Greenhouse Gas

Re-evaluation of potential significance or effect from temporary work camps is recommended following final design.

14.1.3.6 Community Well-Being

- The owner / operator to establish working groups with Marten Falls First Nation and Aroland First Nation to discuss community concerns and proposed topics, including those in relation to changes in population or social demographics;
- Owner / operator to develop and implement Diversity, Equity, and Inclusion hiring policies to prioritize women and reduce gender disparities;
- The owner / operator to establish working groups with Marten Falls First Nation and Aroland First Nation to discuss construction-related issues and unemployment by identifying and removing employment barriers, offering job readiness programs, and providing counseling and addiction support services to support community members;
- Owner / operator to develop and implement Community Readiness Strategies and Adaptive Management Plans to assess and respond to community needs;
- Develop a comprehensive inventory of the labour and business / procurement / contracting requirements for the project by identifying project requirements (in other words, labour needs, business / procurement needs and contracting needs); and categorizing requirements by time frame (in other words, short-term, medium-term, and long-term);
- Develop a comprehensive inventory of the Marten Fall First Nation and Aroland First Nation current labour and business / procurement / contracting capacities and capabilities to address the Project's requirements by engaging Marten Falls First Nation and Aroland First Nation leaders and members virtually; collecting data (in other words, labour market information; and business and procurement data); analyzing and categorizing skills inventory, business capabilities and contracting experience;
- Conduct a labour and business / procurement / contracting demand and supply gap analysis and develop initiatives to address the gaps;
- Create a Local Content Plan to utilize a certain dollar value or share of operations towards local businesses and owner / operators;

- Owner / operator to create a Local Training Plan to complete a local skills assessment and utilize local labour force;
- Owner / operator to provide information on available opportunities and training programs to help community members obtain necessary qualifications;
- Owner / operator to offer ongoing job readiness programs and coordinate training timing to support workforce transition and career growth;
- Owner / operator to develop and implement Diversity, Equity, and Inclusion hiring policy to prioritize women and reduce gender disparities;
- Owner / operator will develop an Equipment Mobilization Plan with both Marten Falls First Nation and Aroland First Nation for the movement of equipment, personnel, supplies, and resources. Where possible, construction traffic should be separated from community traffic to improve safety and minimize disruptions. The mobilization plan should also include a clear communications strategy to keep the community informed of the mobilization schedule, so that residents are aware of periods of increased heavy equipment traffic on the winter access road;
- Owner / operator will establish working groups with Marten Falls First Nation and Aroland First Nation to meet regularly to discuss community-proposed topics in relation to the construction of the Community Access Road, including topics avoiding pressure on local, essential services and infrastructure;
- Owner / operator will develop waste management policies to minimize waste production and support responsible disposal. Collaboration with the community will be prioritized to develop effective construction waste management and disposal strategies, incorporating local input;
- Owner / operator will establish a secure fuel storage facility and maintain a reliable fuel supply throughout the construction season. Fuel deliveries will be planned in advance and transported via the winter access road, reducing reliance on costly air transport and preserving community fuel resources. All fuel storage sites will comply with safety and environmental regulations to prevent spills and contamination;
- Owner / operator to establish working groups with Marten Falls First Nation and Aroland First Nation to meet regularly to discuss community-proposed topics in relation to the construction of the Community Access Road, including topics associated with housing adequacy, and converting construction camps to permanent housing;
- House workers in autonomous camps to limit demographic shifts and reduce pressure on community housing;

- Prior to construction, owner / operator will develop Access Management Plans with Marten Falls First Nation and Aroland First Nation in relation to hunting, trapping and gathering activities. All activities must conform to licensing requirements and adhere to the rules and regulations under the Ministry of Natural Resources;
- Compile information on use of surface water for transient recreational and potable water sources and locations of use;
- Conduct surface water sampling where project effects are likely to interact with use of surface water for transient recreational and potable water sources to establish existing conditions;
- Owner / operator to work with communities and governments, as required, to support education and development of Indigenous Conservation Officer (Game Warden) program;
- Supplement existing conditions information related to the chemicals or concern present in country foods with the collection of additional samples from Marten Falls First Nation and Aroland First Nation members over several years;
- Explore opportunities to increase total Driver Licence holders, alongside the Ministry of Transportation, including partnerships with third-party remote licence providers;
- Develop Equipment Mobilization Plans with local First Nations for the movement of equipment, personnel, and supplies;
- Develop, with the Ministry of Health, onsite safety and emergency preparedness programs to include fire suppression systems, medical care, security personnel, monitor safety compliance, emergency response plans and clear communication protocols between construction teams and emergency responders; and
- Chemical analysis of quarry materials to be used in road construction should be completed during detail design. These materials will ultimately make up the majority of the fugitive dust created during road construction and operations. Interpretation of this information can be used to source materials with the least potential impacts and to support appropriate mitigations are implemented.

Access to Clean Water - Water Quality:

- For groundwater, a pre-construction geochemical testing and monitoring program to assess the potential for acid rock drainage from any soils or bedrock that will be exposed during construction. The groundwater quality samples should be analyzed for general water quality parameters at minimum (such as, pH, temperature, conductivity, hardness, alkalinity, chloride, nitrate, nitrite, sulphate,

phosphate, ammonia, total dissolved solids, dissolved organic carbon, calcium, copper, iron, magnesium, manganese, potassium, sodium, and zinc). Additional parameters of concern should also be sampled for where identified.

Traditional Foods:

- During detail design, develop and implement a geochemical testing and monitoring program to assess the potential for acid rock drainage from any soils or bedrock that would be exposed during aggregate extraction. Include assessment of the material proposed to be used for road construction for potential for metal leaching and metal composition. Fugitive dust from the Project will be made up of materials proposed to be used for road construction.

14.1.3.7 Land and Resource Use

The owner of the road should be in negotiations with land users for the area that have expressed concerns with impacts associated with socio-economic losses as a result of the Community Access Road. Continued consultation during detail design will be required to address these concerns and comments. Future discussions and engagement with Ontario Parks will be completed during detail design to implement a communication strategy in order to provide ample notice for recreation users in the areas of construction.

14.1.3.8 Visual Environment

- Ground truth sensitive receptors and viewsheds within / adjacent to the Construction Disturbance Area;
- Identify design and construction constraints that protect visual character (buffers, edge form, finishes, lighting);
- Establish more robust existing conditions, photographic records, and dark-sky reference conditions at crossing locations and near Marten Falls;
- Point Receptor Validation and Protected or Priority No-Go View Cone Mapping: Field verification with Indigenous Knowledge holders, Parks representatives, or other applicable community representatives to confirm exact lines of sight for specific locations that hold unique, sacred, or otherwise special, Indigenous cultural or sense of place value points identified during this assessment or through further engagement. These are locations that would be considered absolute no-go locations for Project-related visual environment effects; wherein destruction of the overall visual character (for example, clearing of all vegetation and constructing a road) of

this precise location would be detrimental. One example of this type of location could be a burial ground. Further engagement and ground-truthing is required to identify these precise locations during the final design and micro-siting stages of the Project;

- Install, surveyed photo-stations (minimum three at each of the Albany River Crossing and Ogoki River Crossing): upstream near, upstream mid, downstream near; plus, two along the Marten Falls approach, and areas identified in the task and deliverable preceding (Point Receptor Validation and Protected or Priority No-Go View Cone Mapping). Capture leaf-on and leaf-off daytime sets; one night set under dark, clear conditions;
- Approve fixture cutsheets (for example, for temporary task lights), construction lighting plans with curfews, and mock-ups / samples for matte / low-reflectance finishes. For the finishes of major crossings, community feedback should be garnered to decide on things like paint colour, or if textures / designs could be incorporated into concrete components, with the overall goal of reducing the structures contrast;
- Pre-clearing stakeout of irregular edges and feathering blocks; micro-siting of abutments / approaches to minimize profile in where there are major sightlines where feasible;
- One field campaign per season prior to first clearing (at minimum, spring and late summer) and
- Led by the Environmental / Visual Lead with Indigenous monitors and Parks staff (for works inside park boundaries).
- Existing condition and follow-up photo-monitoring and ground-truthing for absolute no-go locations, and recommended at minimum for Albany and Ogoki River Crossings and Marten Falls approach (day and night), using fixed, surveyed photograph points;
- Co-development of finishes and edges with Indigenous Knowledge holders (including a workshop to share mock-ups, and site walks as necessary to understand the existing visual environment. The goal should be to get the communities feedback on what colours or architectural finishes could feasible be used to reduce the overall visual contrast of the major crossings);
- Lighting control: no continuous lighting; task-only, full cut-off fixtures with curfews; night audits;
- Staging of temporary construction areas within the view cone of absolute no-go or priority areas; and providing notice for when construction will occur and where;

- Feathered edges at major crossing locations, or where feasible; retain screening vegetation; naturalised shoreline shaping with local materials;
- Targeted screening at validated headlight lines of sight (low berms / dense planting) or other protected or priority locations if needed;
- Progressive reclamation of temporary surfaces with organics salvage and native seeding if required; and
- Coordination with Northern Road Link and Anaconda and Painter Lake Upgrades on lighting, staging, and sequencing at shared nodes to reduce cumulative duration and clutter where there is spatial and temporal overlap between the Projects.

14.2 Construction Monitoring Programs

Construction is the time when physical work to the road and associated facilities is being completed onsite, including things like clearing, grubbing or any early works site clearing activities. During this period, the road and all facilities are constructed, and teams may continue to obtain permits for operations. More information on the details noted in the sections below can be found in the respective disciplines Technical Support Document in the appendices of the Environmental Assessment / Impact Statement.

14.2.1 Water

14.2.1.1 Surface Water

During construction, the following monitoring programs will be required for surface water in the Local Study Area:

- In-situ monitoring of one or more surface water quantity and quality parameters (including but not limited to water taking and discharge rates, pH, temperature, dissolved oxygen, turbidity, conductivity, and other contaminants of concerns as required) and sampling for laboratory analysis of surface water quality parameters (including but not limited to hardness, alkalinity, total suspended solids, total dissolved solids, dissolved organic carbon, biochemical oxygen demand, major and minor ions (including sulphate), total metals, nutrients (total phosphorus, total ammonia, total Kjeldahl nitrogen), total and dissolved organic carbon, and other contaminants of concerns as required) will be conducted at water taking and / or discharge locations to satisfy the conditions / requirements of Water Taking and Discharge Plans related to applicable permits and approvals (for example, Permit to Take Water, Environmental Compliance Approval and / or Environmental Activity and Sector Registry), and to confirm the effectiveness of

the Water Taking and Discharge Plans and associated mitigation and enhancement measures. Qualified environmental personnel (with expertise in surface water and water quality such as a water resources engineer) will be retained for monitoring program to help confirm that the proposed environmental safeguards are in place, and effectively utilized in protecting the environment;

- Monitoring / inspecting all erosion and sediment management measures, bank stabilization features, and cofferdams during construction to verify the performance and effectiveness of mitigation and enhancement measures; and
- Monitoring of total suspended solids and / or turbidity (instrumented measurements and / or visual observations), as well as visual inspections to confirm the presence or absence of oil or sheen, will be coupled with monitoring of streamflow rates and / or water levels, as required to meet regulatory or permitting requirements, at all water crossings targeted for in-stream works during construction to verify effectiveness of construction procedures and mitigation measures including dam and pump / diversion activities associated with the removal and / or installation of temporary or permanent crossing structures. An Adaptive Management Plan will be developed in the event of an unexpected change to water quantity or quality (in other words, increase in turbidity in accordance with Canadian Council of Ministers of the Environment standards). Adaptive Management Plan will be provided in permit / approval application for review by regulatory authorities in advance of any construction activities, as applicable.

14.2.1.2 Fish and Fish Habitat

During construction, the following monitoring programs will be required:

- Environmental Monitors and Indigenous Environmental Monitors will be onsite during construction to confirm that all waterbodies crossed by the Community Access Road right-of-way and access roads have been identified and documented in the waterbody crossing list. The Environmental Monitors will monitor the installation, use, and removal of waterbody crossing structures. The Environmental Monitors will confirm that the appropriate waterbody crossing structure is being used and that the required Fisheries and Oceans Canada and the Ministry of Natural Resources approvals and permits are in place;
- If new waterbodies are identified during construction, the waterbody will be clearly flagged and activity will be suspended within 30 metres of the location until an Aquatic Specialist has assessed the waterbody and determined a

suitable course of action, which may include contacting Fisheries and Oceans Canada and the Ministry of Natural Resources;

- Appropriate erosion and sedimentation control measures will be installed, monitored, and managed to minimize or avoid sediment mobilization from the disturbed area to drainages or waterbodies. Adequate and appropriate erosion and sedimentation control materials will be onsite and available prior to commencement of construction;
- A Licence to Collect Fish for Scientific Purposes from the Ministry of Natural Resources will be obtained and Aquatics Specialists will rescue and relocate fish within the isolated workspace prior to construction in the isolated workspace; and
- Turbidity and total suspended solids will be monitored according to Fisheries and Oceans Canada, and the Ministry of Natural Resources permit requirements and will follow the Canadian Council of Ministers of the Environment's Canadian Water Quality Guidelines for the Protection of Aquatic Life (Canadian Council of Ministers of the Environment, 1999).

14.2.1.3 Groundwater and Geochemistry

A groundwater monitoring program to measure groundwater levels and quality and compare them to existing conditions. Groundwater levels and quality will be monitored as follows:

- Groundwater monitoring stations established for the pre-construction monitoring programs will be maintained and monitored through construction;
- Groundwater levels will be measured at the monitoring stations at least weekly during construction activities. During active groundwater takings, the nearby groundwater levels will be measured at least daily;
- Groundwater quality will be sampled at the monitoring stations at least monthly for the same parameters as the pre-construction monitoring; and
- In addition to the above recommended construction monitoring, at sites where construction activities require permits for dewatering and water management such as Permit to Take Water, Environmental Activity and Sector Registry, and / or Environmental Compliance Approvals, the groundwater monitoring will be enhanced and maintained on a site-by-site basis to support any permit requirements.

As construction proceeds, the monitoring program may need to be modified or updated based on changing conditions or work plans. The monitoring program will be overseen

by and directed by a qualified person retained for environmental monitoring of the Project and will include Indigenous Environmental Monitors.

14.2.1.4 Peatlands

During construction, the following monitoring programs will be required. These programs will be further developed during the preparation of the Environmental Protection Plan in consultation with Indigenous communities:

- An invasive species monitoring program designed to prevent, detect, and control (in other words remove) invasive species and monitor areas where invasive species were removed;
- A program designed to monitor groundwater on both sides of the Community Access Road to determine whether water flow beneath the road is being maintained throughout construction will be carried out where the “floating road” construction methodology is used through peatland communities. Monitoring will occur at the same locations established during pre-construction and will occur three times annually (spring, summer, fall) throughout the duration of construction;
- A program to monitor peatland community response to any potential changes in hydrogeology throughout construction (such as in the vicinity of dewatering activities and either side of “floating road” segments);
- A program to monitor for peatland condition in the vicinity of Project activities. The program will include science-based thresholds or indicators of peatland condition based on research and established standards, as well as mitigation and adaptive response plan to prevent long-term damage or carbon release;
- In addition to the construction surface water monitoring programs specified in the Surface Water Technical Support Document (**Appendix F**), monitoring of peatland hydrology will also be conducted. The requirements of this monitoring program will be determined at detail design, and
- A program to monitor whether erosion and sedimentation control measures are functioning as intended and to direct repair and adaptive management measures, where required.

14.2.2 Land

14.2.2.1 Vegetation

During construction, the following monitoring programs will be required. These programs will be further developed during the preparation of the Environmental Protection Plan in consultation with Indigenous communities:

- An invasive species monitoring program designed to prevent, detect, and control (in other words, remove) invasive species and monitor areas where invasive species were removed;
- A program designed to monitor any rare plant, or Species at Risk protection measures that have been implemented (for example, check for damage or failure of protection fencing and make repairs);
- A program designed to monitor groundwater on both sides of the Community Access Road to determine whether water flow beneath the road is being maintained throughout construction will be carried out where the “floating road” construction method is used through peatland communities. Additional details are provided in the Peatlands Technical Support Document (**Appendix I**);
- A program to monitor vegetation community response to any potential changes in hydrology or hydrogeology throughout construction (for example, in the vicinity of dewatering activities and either side of “floating road” segments); and
- A program to monitor whether erosion and sedimentation control measures are functioning as intended and to direct repair and adaptive management measures, where required.

14.2.2.2 Wildlife

Engagement and consultation with Indigenous communities and federal and provincial regulators, as well as requirements outlined in federal and provincial permits, will determine the monitoring programs during construction.

During construction, the following monitoring programs may be required:

- An Environmental Monitor and Indigenous Environmental Monitor will be retained to monitor the development footprint during construction to identify and sensitive wildlife features that have not previously been identified on or near the Construction Disturbance Area. In the event that a sensitive feature is identified

(or suspected to be present) it will be afforded protection according to the Environmental Protection Plan;

- A reporting protocol and system to report incidental wildlife observations and wildlife-vehicle collisions (bats, furbearers and other large mammals, and reptiles and amphibians) during construction and operations will be developed. The details of the incidental wildlife and wildlife-vehicle collision reporting system will be described in the Environmental Protection Plan;
- Waste management and site surveillance monitoring would be completed to avoid attraction of wildlife to the Project and associated risks of adverse human-wildlife interactions. Potential problem areas at the Project would be identified as part of monitoring, which could lead to the implementation of targeted mitigation measures in these areas to limit human-wildlife conflicts. The details of the waste management and site surveillance monitoring will be described in the Waste Management Plan and Environmental Protection Plan;
- Ground-based or aerial pre-clearing surveys ("wildlife sweeps") will be completed within a biologically relevant distance of the Construction Disturbance Area under the direction of the Environmental Monitor and Indigenous Environmental Monitor, prior to any clearing or grubbing. The wildlife sweeps will entail surveying for sensitive wildlife features, including mammal dens, beaver lodges, amphibian and reptile habitats, and bat maternity roost habitat, and documenting the presence of large mammals;
- Details of the ground-based pre-clearing surveys (wildlife sweeps) will be described in the Environmental Protection Plan, which will be prepared prior to the Project authorization process so as to inform federal and provincial authorizations, as necessary;
- The wildlife sweeps will include surveys to identify potential Species at Risk bat maternity roost habitat within the Construction Disturbance Area to determine the presence of potential bat habitat prior to any tree clearing to be conducted during the bat maternity roost season (May 1 to September 30). Surveys would be conducted to search the Construction Disturbance Area for trees that could provided roosts for little brown myotis and northern myotis (candidate roost trees). Candidate roost trees are defined as trees greater than 10 centimetres diameter at 1.3 metres above the ground, with exfoliating bark, cracks, crevices, or cavities;
- If potential maternity roosting habitat is identified and planned to be removed during the roosting period, bat exit surveys may be conducted depending on the

outcome of consultation and *Endangered Species Act* (Government of Ontario, 2007) permitting with the Ministry of the Environment, Conservation and Parks Species at Risk Branch;

- Construction activities causing loud noises including the use of heavy machinery will not be undertaken adjacent to (in other words, within 50 metres) candidate or confirmed maternity roosts between half an hour before sunset to half an hour after sunrise during the maternity roost season;
- The wildlife sweeps will include surveys to identify American marten dens (and the dens of other furbearing mammals) within the Construction Disturbance Area to determine mammal presence prior to any clearing or grubbing / excavation. Any American marten dens observed will be marked as sensitive and be afforded protection prior to any construction. In the event that American marten dens are identified the mitigation described in the Wildlife Technical Support Document will be followed (**Appendix K**). In the event that dens of other furbearing mammals are observed, mitigation measures outlined in the Environmental Protection Plan will be followed;
- The wildlife sweeps will include surveys to identify beaver lodges within the Construction Disturbance Area to determine potential beaver habitat prior to any clearing or grubbing / excavation or installation of bridges or culverts. Any beaver lodges observed will be marked as sensitive and be afforded protection prior to any construction. In the event that beaver lodges are identified the mitigation described in the Wildlife Technical Support Document will be followed (**Appendix K**);
- The wildlife sweeps will include surveys for reptiles and amphibian. Any reptiles or amphibians found within work areas will be relocated to suitable habitat nearby. Safe handling practices will be used to move turtles, snakes and other herpetofauna to areas away from the construction (for example, Ontario Species at Risk Handling Manual: For Endangered Species Act Authorization Holders; Ministry of Natural Resources, 2014c);
- Areas with potential to support wolverine denning will be identified through a review of plant community mapping (looking for communities that may contain the microhabitat features), and targeted aerial site reconnaissance during the same denning period that construction activities are planned to survey for signs of potential denning areas prior to the initiation of construction activities (for example, clearing and grubbing);

- If clearing or grubbing are required during the wolverine denning period (January 15 to May 31) in habitat suitable for wolverine denning, surveys for the presence of wolverine dens will be conducted prior to clearing. Surveys will be conducted from helicopters or drones. The survey extent will include all potentially suitable denning habitat within 4 kilometres of the disturbance. Den sites require a physical structure such as fallen trees, earthen banks, woody debris, or boulders with snow cover for additional structure and insulation (Scrafford and Ray, 2022). All treed communities (including swamps, forests, treed fens, and treed bogs), all eskers and other prominent terrain features, all rock barrens, all thicket swamps, all watercourse and lakeshore riparian area, and all forestry cut blocks have potential to support maternal denning, Open water and open wetlands such as marshes, open fens, and open fens are not considered suitable for maternal denning;
- The methods of the surveys will be determined in consultation with the Ministry of the Environment, Conservation and Parks Species at Risk Branch and will be described in the Environmental Protection Plan;
- Due to the difficulty in confirming the presence of a wolverine den through aerial surveys, a conservative approach will be taken to the identification of potential wolverine dens and denning areas. The positive identification of potential wolverine denning site or denning areas will use a weight of evidence approach and consider several observations including:
  - Several wolverine tracks observed in the search area;
  - Wolverine tracks concentrated in certain areas; and
  - Wolverine tracks observed disappearing into snow covered blowdown or drifts.
- Observations of wildlife and wildlife signs will be documented and reported to the owner / operator's Environmental Monitor and the Environmental Monitor will confirm all Species at Risk observations are reported to the Natural Heritage Information Centre as per the Report Rare Species (Animals and Plants) site (Ministry of Natural Resources, 2014) and to Ministry of the Environment, Conservation, and Parks – Species at Risk Branch at SAROntario@ontario.ca.

14.2.2.3 Birds

During construction, the following monitoring programs will be required:

- Clearing activities will occur outside the breeding season for most bird species, from August 15 to April 27, where possible (90 percent of species in nesting zones C5 and C6 are expected to be actively nesting between April 28 and August 14; Environment and Climate Change Canada, 2023d);

- If any clearing is required during the migratory bird nesting season (April 28 through August 14), non-intrusive pre-clearing nest surveys will occur within 3 to 7 days prior to clearing; the maximum number of days prior to clearing will depend on the time during the nesting season:
  - During the peak migratory bird nesting season (when more than 40 percent of birds are predicted to be nesting; May 19 through July 30) non-intrusive pre-clearing nest surveys will be completed a maximum of 3 days prior to clearing;
  - During non-peak nesting periods (April 28 through May 18 and July 31 through August 14), non-intrusive pre-clearing nest surveys will be completed a maximum of 7 days prior to clearing; and
  - Pre-clearing nest surveys will be completed by avian biologists with support from Indigenous Environmental Monitors, where possible.
- If any areas are found to have birds exhibiting breeding behaviour during non-intrusive pre-clearing nest surveys, these areas, including an activity disturbance buffer, will be flagged, and protected from disturbance until the fledglings have left the nest or the nest is otherwise deemed unoccupied (in other words, the nest is depredated);
- In addition to nest surveys during the migratory bird nesting season, wildlife sweeps will be completed outside of the nesting season to look for and document pileated woodpecker nesting cavities and raptor stick nests. Wildlife sweeps will focus on mature and old growth forest dominated by deciduous trees as these habitats are most likely to have large trees that can support raptor stick nests and pileated woodpecker nests. Wildlife sweeps will be led by avian biologists with support from Indigenous Environmental Monitors, where possible; and
- The effectiveness of mitigation measures will be evaluated during construction and operations, and mitigation measures will be modified or enhanced as necessary through adaptive management.

14.2.2.4 Ungulates

Engagement and consultation with Indigenous communities and federal and provincial regulators during the permitting phase, as well as requirements outlined in federal and provincial permits, will determine the monitoring programs during construction.

A sensitive data license agreement will be established with the Ministry of the Environment, Conservation and Parks' Species at Risk Branch for the Project (in other

words, owner / operator) to acquire boreal caribou protected habitat information, which will support monitoring and other proposed mitigation commitments during construction.

An Ungulates Management and Monitoring Plan will be developed as part of the Environmental Protection Plan. Recommendations for mitigations and monitoring approaches provided by First Nations during the comment period of the Draft Environmental Assessment / Impact Statement will be considered for inclusion in the Ungulates Management and Monitoring Plan. During construction, the following monitoring programs may be required:

- Clearing, construction activities and decommissioning of temporary construction areas in and within 10 kilometres of Category 1 nursery use areas will occur outside the sensitive timing window of May 1 to September 15, to the extent practical. Clearing and construction activities in and within 10 kilometres of Category 1 winter use areas will occur outside the sensitive timing window of December 1 to March 31, to the extent practical. If activity restrictions cannot be followed for construction activities, Indigenous communities, in addition to the Ministry of Environment, Conservation and Parks, will be engaged to determine alternative approaches. This may include daily monitoring of caribou locations with collars and only commencing construction activities if collar data indicates that there are no caribou within pre-defined “cautionary zones” (pre-defined spatial buffer areas);
- Cautionary zones will be pre-defined spatial buffer areas based on the level of sensory disturbance expected for the activity;
- A hierarchy of mitigation actions based on disturbance type, distance from caribou, and season will be established;
- In addition to the intensive monitoring during sensitive seasons described above, ground-based or aerial pre-clearing surveys (“wildlife sweeps”) will be completed outside of the sensitive timing windows and within a biologically relevant distance of the Construction Disturbance Area under the direction of the Environmental Monitor, prior to any clearing or grubbing. The wildlife sweeps will entail surveying for sensitive wildlife features, including mammal dens, beaver lodges, amphibian and reptile habitats, and bat maternity roost habitat, and documenting the presence of large mammals. Trained staff will survey the area to be cleared or where blasting will take place by foot, all-terrain vehicle, snow machine or truck. An Indigenous Environmental Monitor will participate in pre-clearing surveys. Observations of wildlife and sign will be documented and reported to the owner / operator’s Environmental Manager and the Environmental Manager will help to confirm all Species at Risk observations will be reported to the Natural

Heritage Information Centre as per the Report Rare Species (Animals and Plants) site ((Ministry of Natural Resources, 2014) and to Ministry of the Environment, Conservation, and Parks – Species at Risk Branch at SAROntario@ontario.ca. Details of the ground-based pre-clearing surveys (wildlife sweeps) will be described in the Environmental Protection Plan which will be prepared prior to the Project authorization process so as to inform federal and provincial authorizations, as necessary;

- Indigenous Environmental Monitors will be on site during construction to confirm adherence to all mitigation and monitoring commitments for the Project [as summarized in Table 7-31 of the Ungulates Technical Support Document (**Appendix M**) and in any subsequent permits] and that the required approvals and permits are in place;
- The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management; and
- A reporting protocol and system will be developed to report Species at Risk observations, including resulting from collisions, during construction and operations, to the Ministry of Natural Resources Natural Heritage Information centre. The details of the incidental wildlife and wildlife-vehicle collision reporting system will be described in the Environmental Protection Plan.

During construction, operations, the following Before-After Control-Impact monitoring programs are potential approaches that could be discussed and evaluated as options during engagement and consultation:

- Deploying and maintaining Global Positioning System collars on adult female caribou, for comparison of caribou seasonal movement patterns, habitat use and mortality in the vicinity of the Project compared to historical Ministry of Natural Resources collar data and collar data collected during baseline studies (2021 to 2024). Monitoring the movements of female caribou in the vicinity of the Project will allow for identification of changes related to areas where caribou occur during sensitive / vulnerable periods as well as their seasonal movement patterns, including possible travel corridors, during construction and operations. Monitoring with collars also would include conducting mortality investigations of collared animals as they occur; this will provide information about changes in causes of mortality during Construction and operations. The number of collars and duration of years for monitoring during Construction and operations will be determined through engagement with Ministry of Environment, Conservation and Parks;

- Deploying and maintaining Global Positioning System collars on adult female moose, for comparison with seasonal movement patterns, habitat use and mortality data from moose collars deployed by Ministry of Natural Resources in the moose Wildlife Management Units pre-construction (anticipated deployment in 2025). Monitoring the movements of female moose in the vicinity of the Project will allow for identification of changes related to areas where moose occur during sensitive / vulnerable periods as well as their seasonal movement patterns during construction and operations. Monitoring with collars also would include conducting mortality investigations of collared animals as they occur; this will provide information about changes in causes of mortality during Construction and operations. The number of collars and duration of years for monitoring during Construction and operations will be determined through engagement with Ministry of Natural Resources;
- Remote camera monitoring at selected reference sites (in other words, locations surveyed in the alternative Project route Local Study Area during baseline surveys from 2021 to 2023 and on undisturbed sites) and within the vicinity of the Project. Remote camera monitoring will provide information about the occurrence and distribution of large mammals in the ungulate Local Study Area and whether there are changes in ungulate presence, habitat use and predation risk with the addition of the Project. Remote cameras could be deployed for a continuous period of at least 2 years during construction and at least 2 years during operations; the need for surveys further into operations will be determined through engagement with the Ministry of Environment, Conservation and Parks;
- More frequent aerial surveys for moose within the ungulate Local Study Area and the moose Wildlife Management Units in the moose Regional Study Area (01D, 17, 18A) in collaboration with the Ministry of Natural Resources. Aerial survey monitoring will provide information about moose population trends, occurrence and distribution in the ungulate Local Study Area and moose Regional Study Area and whether there are changes in moose population size and demographics with the addition of the Project. Aerial surveys that were conducted by Ministry of Natural Resources in WMUs 01D, 17, and 18A will be used to characterize moose populations at existing conditions and compare to during construction and operations. Aerial surveys could be conducted at least twice during construction and at a regular interval (such as every 3 years) during operations. The need for surveys further into operations will be determined through engagement with Ministry of Environment, Conservation and Parks;
- Developing community-based monitoring program in consultation and collaboration with Indigenous communities aimed to monitor Indigenous harvest

to identify potential changes to moose hunter harvest in response to increased human access during construction and operations. Monitoring Indigenous harvest through community-led programs will provide information on Indigenous hunter harvest demand and success, and moose population trends. Information on Indigenous harvest from these community-led programs could be used to inform non-Indigenous hunting quotas set by the Ministry of Natural Resources as a method of collaboratively managing moose populations in the moose Regional Study Area. Action levels or triggers for implementing adaptive management measures would be determined through collaboration with Indigenous communities and the Ministry of Natural Resources;

- A comprehensive Moose Access and Monitoring Plan will be developed in collaboration with Indigenous communities to identify high-risk moose collision zones to inform adaptive management (in other words, the implementation of signage and reduced speed limits) and for long-term monitoring of moose-vehicle collisions. The plan would be developed to protect the safety of people and moose. High-risk moose collision zones would be identified through community-based observations, collision reporting by Ontario Ministry of Transportation, and results from long-term monitoring of moose occurrence described above (in other words, Global Positioning System collars, remote cameras and aerial surveys);
- Designing a long-term sensory disturbance monitoring program, in consultation and collaboration with Indigenous communities, aimed to detect changes in ungulate behaviour in response to noise during construction and operations. This program could fill knowledge gaps and act as a research component of the Preliminary Biodiversity Offset Plan (**Appendix AB**); and
- Monitoring will follow standardized / established methods. A monitoring schedule, description of performance indicators that will be used to evaluate the effectiveness of mitigation measures, and adaptative measures to be implemented if necessary to address issues or problems identified during construction monitoring will be detailed prior to construction. The details of the ungulate monitoring programs will be described in the Environmental Protection Plan.

14.2.2.5 Physiography, Terrain and Soils

During detail design, a Project-specific Soil Management Plan will be developed, which could include the following:

- Slope stability monitoring during land clearing, site preparation, and construction of facilities, especially road components adjacent to rivers, creeks, and streams;

- Monitoring for admixing of soil, compaction, and erosion during clearing, contouring, and excavation activities;
- Monitoring of transportation of soil and stockpiling activities for signs of erosion;
- Monitoring of erosion and sedimentation control measures to avoid and minimize sediment mobilization from disturbed areas to drainages, wetlands, or watercourses;
- Monitoring of soil stockpiles and the Construction Disturbance Area for invasive species such as weeds. If invasive species are identified within the Construction Disturbance Area, a response plan will be prepared;
- Monitoring and managing reclamation concerns pertaining to soil erosion, revegetation, and slope stability; and
- Monitoring of aggregate rehabilitation to fully assess the effectiveness of rehabilitation and detect any unintended effects.

14.2.3 People

14.2.3.1 Aboriginal and / or Treaty Rights and Interests

The following Aboriginal and / or Treaty Rights and Interests-specific mitigation measures are proposed and must be confirmed with all relevant parties, including Marten Falls First Nation and the province:

- Collaboration with local existing environmental advisory committees to support the development and implementation of all environmental monitoring programs. The objective is to include Indigenous interests and perspectives, particularly concerning resources utilized for rights-based purposes. In the absence of an existing advisory committee with an aligned mandate to Marten Falls First Nation, a Terms of Reference between relevant agencies and Indigenous community will be established.
- Involve Indigenous community members in fieldwork and data collection. This participatory approach helps to weave Indigenous Knowledge, experience, values, and perspectives into the monitoring process.
- Develop a system to incorporate seasonal observations from Indigenous hunters, trappers, and land users who have firsthand experience with caribou movements to complement scientific data and provide real-time information.

14.2.3.2 Acoustic and Vibration Environment

A noise monitoring program is not recommended for the Project. Vibration monitoring is expected to be required for both temporary quarries and general construction blasting activities to align with Ministry of the Environment, Conservation and Parks / Ministry of Natural Resources requirements and general industry practices, respectively. Monitoring requirements will be considered and assessed once detailed information regarding the blast designs are available. Based on typical blasts, monitoring would be recommended for construction blasting within 250 metres and quarry blasts within 500 metres of receptors verified to be vibration sensitive.

14.2.3.3 Cultural Heritage

Construction monitoring for this discipline will be further determined based on the results of the Cultural Heritage Evaluation Reports described in **Section 14.1.3.3**.

14.2.3.4 Archaeology

Construction monitoring for this discipline will be further determined based on the results of the Stage 2 Archaeological Assessment described in **Section 14.1.3.4**.

A Stage 3 site-specific archaeological assessment is recommended for the Caviar (EiIp-1) site. Avoidance and protection are the preferred options either through project redesign or excluding or incorporating the area of the archaeological site into the development plan. Given that the site is located on the periphery of one of the route options, avoidance and protection might be possible upon choosing the preferred route. The site could therefore be avoided and protected during construction and the integrity of the area could remain intact. Should an avoidance and protection strategy for the Caviar (EiIp-1) site be implemented during construction, it must include:

- Placement of a temporary barrier around the site, including a 20-metre protective buffer of land surrounding the site;
- Monitoring by a licensed consultant archaeologist for any construction activities that occur within 70 metres of the site;
- The issuance of “no-go” instructions within the 20-metre buffer to all onsite construction personnel or others involved in the construction process (for example, engineers and architects) (Government of Ontario, 2011, Section 4.1.1);

- Illustration of the location of the area to be avoided on contract drawings, including explicit instructions to avoid the area;
- The presence of a licensed archaeologist onsite to inspect fence installation, inspection of the site by a licensed archaeologist after the completion of all soil-disturbing activities, and reporting of the effectiveness of the avoidance and protection strategy to the Ministry of Citizenship and Multiculturalism; and
- Should future repairs or improvements be required near the Caviar (EiIp-1) site or should changes to the current Project Study Area be required, archaeological monitoring by a licensed archaeologist will be required to confirm that the No-Go zone remains in place and that the archaeological site is protected from construction or soil disturbance activities.

14.2.3.5 Atmospheric and Greenhouse Gas

A construction monitoring program is recommended as a mechanism to help mitigate and / or identify potential conditions that may lead to air quality impacts from construction-related activities. A monitoring program, where feasible, may involve either or both air monitoring as well as construction activity monitoring. Construction activity may include verification that construction best management practices are being applied or identify where additional efforts / mitigation techniques may be necessary to help reduce air quality impacts. Construction monitoring may be beneficial in locations where sensitive receptors are in close proximity to the Construction Disturbance Area. Details specific to the scope of the monitoring program would need to be evaluated further following final detail design phases of the Project. Engagement with the Ministry of the Environment, Conservation and Parks to establish an appropriate monitoring program may be beneficial.

14.2.3.6 Community Well-Being

During construction, the following monitoring programs are proposed:

- Owner / operator to implement a monitoring program and perform safety checks at work camps and entry points (for example, airport) for alcohol and substances to prevent entry into the community;
- Owner / operator will develop a community-based reporting system that enables Indigenous community members and employees to anonymously report concerns, including those relating to violence, harassment, and crime, providing an option for anonymous reporting;

- Owner / operator to provide training and hand-off of all reporting mechanisms that are implemented by the owner / operator, so that the data remains in the hands of the community to support long-term response and prevention; and
- Owner / operator to develop an onsite safety and emergency preparedness program to include:
  - Implement onsite fire suppression systems, including sprinklers and fire extinguishers, to minimize reliance on local fire services;
  - Provide onsite medical care (paramedics, first aid stations, medics) to reduce pressure on local emergency response services;
  - Train and employ onsite security personnel to monitor safety compliance and enforce safety policies, reducing the strain on local police;
  - Work with the Ministry of Health and other appropriate government agencies to develop a coordinated emergency response plan with local responders for efficient handling of construction-related incidents requiring additional personnel; and
  - Establish emergency response plans, including clear communication protocols between the construction teams and local emergency responders.

Access to Clean Water - Water Quality:

- During construction, monitoring of surface water quantity and quality parameters (including but not limited to water taking and discharge rates, pH, total suspended solids, turbidity, temperature, dissolved oxygen, biochemical oxygen demand, and other contaminants of concerns as required). Monitoring of total suspended solids and / or turbidity instrumented measurements and / or visual observations), as well as visual inspections to confirm the presence or absence of oil or sheen.
- A construction groundwater monitoring program to continue the pre-construction monitoring through construction activities to identify and quantify any impacts to groundwater levels or quality resulting from construction activities. Groundwater quality should be sampled at the monitoring stations at least monthly for the same parameters as the pre-construction monitoring.

Traditional Foods Quality:

- During construction, a construction monitoring program is recommended as a mechanism to help mitigate and / or identify potential conditions that may lead to air quality impacts from construction-related activities. An air monitoring station

should be set up in Marten Falls throughout construction and into operations. Air monitoring in the community should have transparency in data to allow sensitive individuals to be aware of levels and remain inside during times of high particulate concentrations.

14.2.3.7 Land and Resource Use

The Contract Administrator should work with the Service Provider and Proponent to provide continuous consultation efforts to communicate with all land users to address potential safety concerns for access to the site during construction. Implement monitoring measures as outlined in the air quality, noise, visual, surface water, fish, wildlife, and ungulates technical reports to manage potential impacts related to remote outfitters.

14.2.3.8 Visual Environment

Construction-phase monitoring will confirm that construction activities and mitigation measures are implemented as designed, and to detect any exceedance of predicted contrast levels early enough for corrective action.

Key activities:

- Weekly field checks from photograph points and along staked limits during active clearing; compare to edge plans;
- Site layout review versus “staging outside view cones” plan, prior to set-up and after any relocation, and photograph captures;
- Daily visual plume logs during dry / windy conditions for visible dust beyond right-of-way or persistent foliage lightening in absolute no-go protected or priority view cones; surface reflectance spot checks (qualitative);
- Night audits at first night use per work front, then weekly if night works recur; lux spot checks at ground level (qualitative pass / fail); and photograph captures;
- As-built checks after bulk earthworks and post-armouring; photographs from water level;
- Annual checklist plus photographs (seeding, organics, decommissioning of temporary access) during construction and into the first year of operations;
- Monthly visual compliance memo during active works with a one-page dashboard (indicators, triggers hit, actions taken); and
- Construction notices coordinated with outfitters / park staff for peak activities at major crossings (to support trip planning and reduce exposure).

14.3 Operations Monitoring Program

Operations begins when construction on the roadway and associated facilities is considered complete, and the roadway and all facilities are open to the public. This may occur in phases depending on the sequencing of the construction activity. Maintenance generally refers to any regularly planned or emergency maintenance that may be required to keep the roadway up to the standards expected by the province or other regulatory bodies. Any permits for significant work during this period would be obtained through a separate Class Environmental Assessment or other process and are not considered here. More information on the details noted in the sections below can be found in the respective disciplines Technical Support Document in the appendices of the Environmental Assessment / Impact Statement.

14.3.1 Water

14.3.1.1 Surface Water

During operations, the following monitoring programs will be required:

- Monitoring / inspections of all new permanent water crossing structures (culverts and bridges) and roadside drainage features for physical function and condition in accordance with the Ministry of Transportation inspection guide and manual (Ministry of Transportation, 2008; 2022b); and
- Monitoring of water quality, sediment quality, and streamflow conditions at waterbodies that include greater sensitivity or implication to change from the standpoint of fish habitat, Species at Risk, channel stability, drainage pattern, or other environmental considerations. The specific monitoring locations will be determined during the permitting and design stages of the Project; however, it is expected that waterbodies of varying size (small, medium, large) would be captured, recognizing that this would allow the performance / effectiveness of mitigation and enhancement measures to be evaluated at a range of scales.

14.3.1.2 Fish and Fish Habitat

During operations the following monitoring programs will be required:

- Culverts and bridges will be regularly inspected and maintained to prevent blockages from forming and causing ponding or backwater effects. Where culverts and bridges are installed at fish-bearing waterbodies, Fisheries and Oceans Canada’s Codes of Practice will be followed for debris removal activities

(such as, gradual removal such that flooding downstream, extreme flows downstream, release of suspended sediment, and fish stranding can be avoided) (Fisheries and Oceans Canada, 2025). Inspection frequency will be adjusted where appropriate to take into account changing climate conditions over time; and

- A program will be conducted to verify that erosion and sediment control measures have been successful (such as bank restoration and revegetation), and that the stability of each waterbody crossing is maintained (in other words, the channel has not washed out). The post-construction monitoring will occur within one full growing season after the completion of construction, but timing may be extended if needed. The integrity of the permanent crossing structures will be inspected regularly (annually in spring). Any changes to the morphology of the waterbody channel affecting fish habitat quality or quantity will be identified and addressed, as needed.

14.3.1.3 Groundwater and Geochemistry

During operations, the following monitoring programs are recommended:

- Where no impacts have been identified, the construction monitoring programs noted above can be ended at sites that have been fully decommissioned in accordance with the Project plans. Where impacts are expected to develop over longer time periods, such as settlement of roads built over peatlands, monitoring should continue long enough to confirm that conditions have stabilized. Any groundwater monitoring wells no longer used for monitoring should be decommissioned in accordance with Ontario Regulation 903 Wells;
- At sites where impacts on groundwater levels or quality have been identified, the groundwater monitoring programs should continue, as per the construction monitoring program, until a return to baseline equivalent conditions is observed or a site-specific remediation monitoring plan is implemented as determined by the qualified person retained for environmental monitoring of the Project; and
- For sites that will continue to be used during operations the groundwater monitoring programs detailed above should continue along with any activities that may affect groundwater. For example, if a pit or quarry site is used intermittently, each use of the pit or quarry should be considered like a construction phase and the monitoring guidelines followed as above.

14.3.1.4 Peatlands

During operations, the following monitoring programs will be required. These programs will be further detailed during subsequent Project phases, in consultation with Indigenous communities:

- A program designed to monitor and manage any rehabilitated and restored peatland communities as well as any wetland offset areas. Details regarding the number of monitoring locations, level of effort and length of the monitoring period will be determined during detail design, if any peatland communities are restored or created;
- A program designed to monitor installed groundwater wells to confirm water flow beneath the road is being maintained. Monitoring will occur at the same locations established during pre-construction and will occur three times annually (spring, summer, fall) for a length of time to be determined during detail design;
- A program designed to monitor peatland community responses to any potential changes in hydrogeology. Details regarding the number of monitoring locations and the length of the monitoring period will be determined in subsequent Project phases;
- A program to monitor for peatland condition in the vicinity of Project activities. The program will include science-based thresholds or indicators of peatland condition based on research and established standards, as well as mitigation and adaptive response plan to prevent long-term damage or carbon release. Details regarding the number of monitoring locations and the length of the monitoring period will be determined in subsequent Project phases; and
- In addition to the operations surface water monitoring programs specified in the Surface Water Technical Support Document (**Appendix F**), monitoring of peatland hydrology will also be conducted. The requirements of this monitoring program will be determined at detail design.

14.3.2 Land

14.3.2.1 Vegetation

During operations, the following monitoring programs will be required. These programs will be further detailed during subsequent Project phases, in consultation with Indigenous communities:

- A program designed to monitor and manage rehabilitated and restored vegetation communities as well as any wetland offset areas. Details regarding

the number of monitoring locations, level of effort and length of the monitoring period will be determined in subsequent Project phases;

- A program designed to monitor installed groundwater wells to confirm water flow beneath the road is being maintained. The number of monitoring locations, their placement and the length of the monitoring period will be determined in subsequent Project phases; and
- A program designed to monitor vegetation community responses to any potential changes in hydrology or hydrogeology. Details regarding the number of monitoring locations and the length of the monitoring period will be determined in subsequent Project phases.

14.3.2.2 Wildlife

Engagement and consultation with Indigenous communities and federal and provincial regulators, as well as requirements outlined in federal and provincial permits, will determine the monitoring programs during operations. As required by the Tailored Impact Statement Guidelines (Impact Assessment Agency of Canada, 2020a), opportunities to participate in the development and implementation of the operations monitoring program will be provided for representatives from Indigenous Groups.

During operations, the following monitoring programs may be required:

- A public reporting system to track report incidental wildlife observations and wildlife-vehicle collisions during and operations, will be developed;
- Effectiveness of reclamation efforts will be monitored and managed post-construction, including confirmation that vegetation communities that naturally regenerate (or were planted) are similar to adjacent vegetation communities; and
- Monitoring for effectiveness of mitigation measures is a requirement of the Tailored Impact Statement Guidelines (Impact Assessment Agency of Canada, 2020a) and may include monitoring of eco-passages for wildlife. As details of their implementation are developed in future design stages, monitoring details will be added to the post-construction monitoring program.

Given the duration and intensity of the construction phase, a Before-After Control-Impact Study will be conducted as discussed in **Section 14.3.2.2**. It will begin prior to construction and continue during operations to allow for a quantitative assessment of potential effects of the Project. Due to the extended length of construction (3 to 10 years) and the segmented approach to construction, it is recommended that the study be initiated during construction for segments built early in the development of the Project so

as not to miss the initial years of post-construction (in other words, prior to the completion of the road). Monitoring during operations (in other words, following completion of the Project) would be a continuation of the Before-After Control-Impact Study.

The purpose of the Before-After Control-Impact Study monitoring program will be to determine the efficacy of mitigation measures, verify the predictions in the assessment**,** to guide any future measures that could be implemented during operations, and to fulfill Species at Risk permitting requirements. The Before-After Control-Impact Study will be based on the methods implemented for the existing conditions study.

For species designated as Threatened or Endangered under Ontario's *Endangered Species Act* (Government of Ontario, 2007), it is anticipated that post-construction monitoring will be a requirement of permitting under the Act.

The following monitoring is anticipated to be required as part of permitting:

- Wolverine hair snag / camera trap surveys: monitoring of wolverine population that interacts with the Project Local Study Area to allow for modelling of the wolverine population density during operations; and
- Bat maternity season acoustics: monitoring to confirm continued presence of Species at Risk bats at stations within the Project Local Study Area as well as relative bat activity levels during operations.

In addition to the monitoring requirements for valued components subject to *Endangered Species Act* permitting, the Tailored Impact Statement Guidelines (Impact Assessment Agency of Canada, 2020a) requires post-construction monitoring surveys be undertaken to evaluate whether there are changes in the valued component communities following construction and evaluate the effectiveness of applied mitigation.

The following monitoring is recommended to satisfy the requirements of the Tailored Impact Statement Guidelines:

- Winter snow tracking: to monitor the abundance and distribution of furbearers during construction and operations;
- Beaver lodge survey: to monitor the abundance and distribution of beavers during construction and operations;
- Remote camera program: to monitor the occurrence and distribution of wildlife during construction and operations. Additional details on the recommended remote camera program are provided in the Ungulates Technical Support Document (**Appendix M**); and

- Autonomous recording unit surveys for anurans: to monitor species presence and distribution during construction and operations.

The final monitoring program will be determined in consultation with Indigenous communities and federal and provincial regulators.

14.3.2.3 Birds

A Before-After Control-Impact Study is proposed for operations monitoring. Data from operations monitoring will be compared to data from reference sites (in other words, sites not affected by disturbance) and data collected prior to construction [in other words, baseline survey (2018 to 2022) point count and autonomous recording unit data] to determine population trends and determine if predictions made in the Environmental Assessment are valid. Field work will be completed and led by avian biologists, with support from Indigenous Environmental Monitors, where possible.

During operations, the following monitoring programs will be required:

- Autonomous recording unit and point count surveys at selected reference sites (in other words, locations surveyed in the alternative Project route Local Study Area during breeding bird, nightjar, and marsh bird baseline surveys from 2018 to 2022). Autonomous recording unit and point count surveys will be completed every 2 years for a period of 6 years; the need for surveys beyond 6 years will be determined in consultation with Environment and Climate Change Canada;
- Two roadside North American Breeding Bird Survey routes (each 40 kilometres long and containing 50 survey locations) will be initiated along the Project (in other words, one transect along the southern portion of the Project and one transect along the northern portion of the Project). The placement of each route will be negotiated with Environment and Climate Change Canada. Each route will be surveyed annually with the goal for the routes to be completed by the same observer for a period of 5 years; the need for surveys beyond 5 years will be determined in consultation with Environment and Climate Change Canada. Surveys will be completed in accordance with Environment and Climate Change Canada and United States Geological Survey standards. Refer to the Preliminary Biodiversity Offset Plan (**Appendix AB**) for more information;
- Three roadside Canadian Nightjar Survey routes (each 20 kilometres long and containing 12 survey locations) will be initiated along the Project (in other words, one transect along the southern portion of the Project, one transect along the middle portion of the Project, and one transect along the northern portion of the Project). Nightjar surveys will be focussed on the detection of Common

Nighthawk and Eastern Whip-poor-will. The placement of each route will be negotiated with Birds Canada and / or Environment and Climate Change Canada. Each route will be surveyed annually with the goal for the routes to be completed by the same observer for a period of 5 years; the need for surveys beyond 5 years will be determined in consultation with Environment and Climate Change Canada. Surveys will be completed in accordance with Birds Canada survey standards. Refer to the Preliminary Biodiversity Offset Plan (**Appendix AB**) for more information;

- A minimum of 10 Marsh Monitoring Program survey stations will be initiated along the Project (in other words, spaced evenly along the Project, where suitable habitat is present). The placement of each station will be negotiated with Birds Canada and / or Environment and Climate Change Canada. Each survey station will be surveyed annually with the goal for the routes to be completed by the same observer for a period of 5 years; the need for surveys beyond 5 years will be determined in consultation with Environment and Climate Change Canada. Surveys will be completed in accordance with Birds Canada survey standards. Refer to the Preliminary Biodiversity Offset Plan (**Appendix AB**) for more information; and
- A minimum of 20 targeted survey stations for Short-eared Owl will be surveyed each year, over a period of 3 years along the Project (in other words, spaced evenly along the Project, where suitable habitat is present; total of 60 surveys). Each survey station will be surveyed a minimum of once over the 3-year period of monitoring and the total monitoring effort will equal or be greater than 60 survey stations completed. Survey stations are not anticipated to be repeated to align with greater spatial coverage throughout the Project. The placement of each station will be chosen to align with the species breeding habitat requirements.

14.3.2.4 Ungulates

Engagement and consultation with Indigenous communities and federal and provincial regulators during the permitting phase, as well as requirements outlined in federal and provincial permits, will determine the monitoring programs during operations.

An Ungulates Management and Monitoring Plan will be developed as part of the Environmental Protection Plan. Recommendations for mitigations and monitoring approaches provided by First Nations during the comment period of the Draft Environmental Assessment / Impact Statement will be considered for inclusion in the Ungulates Management and Monitoring Plan.

A sensitive data license agreement will be established with the Ministry of the Environment, Conservation and Parks' Species at Risk Branch for the Project (such as the owner / operator) to acquire boreal caribou protected habitat information, which will support other proposed mitigation commitments during operations.

A Before-After Control-Impact Study is proposed for operations monitoring to allow for quantitative assessment of potential effects of the Project. If a Before-After Control-Impact Study was initiated in construction (**Section 14.2.2.4**), this would be a continuation. Data from operations monitoring will be compared to data collected prior to construction and data collected during construction to determine if predictions made in the Environmental Assessment are valid and to monitor changes in population trends and habitat use through time. Potential approaches to Before-After Control-Impact monitoring are described in **Section 14.2.2.4**.

Monitoring during operations will follow standardized / established methods. A monitoring schedule, description of performance indicators that will be used to evaluate the effectiveness of mitigation measures, and adaptative measures to be implemented if necessary to address issues or problems identified during operations monitoring will be determined through engagement with regulators. An Indigenous Environmental Monitor would be included in monitoring programs during operations.

14.3.2.5 Physiography, Terrain, and Soils

Inspections and maintenance of roadside ditches and culverts will be conducted as appropriate to limit the risk of road washout or sediment release to the environment. The frequency of these inspections will likely vary depending on weather events, amount of traffic, and season.

A program will be conducted to verify that erosion and sediment control measures have been successful (for example, bank restoration and revegetation) and that the stability of each waterbody crossing is maintained (in other words, the channel has not washed out). The post-construction monitoring will occur within one full growing season after the completion of construction, but timing may be extended if needed.

14.3.3 People

14.3.3.1 Aboriginal and / or Treaty Rights and Interests

The following Aboriginal and / or Treaty Rights and Interests-specific mitigation measures are proposed and must be confirmed with all relevant parties, including Marten Falls and the province:

- Collaboration with local existing environmental advisory committees to support the development and implementation of all environmental monitoring programs. The objective is to include Indigenous interests and perspectives, particularly concerning resources utilized for rights-based purposes. In the absence of an existing advisory committee with an aligned mandate to Marten Falls First Nation, a Terms of Reference between relevant agencies and Indigenous communities will be established;
- Involve Indigenous community members in fieldwork and data collection. This participatory approach helps to weave Indigenous Knowledge, experience, values, and perspectives into the monitoring process; and
- Develop a system to incorporate seasonal observations from Indigenous hunters, trappers, and land users who have firsthand experience with caribou movements to complement scientific data and provide real-time information.

14.3.3.2 Acoustic and Vibration Environment

No operational monitoring for acoustic is recommended for the Project.

Vibration monitoring is expected to be required for permanent quarries to align with Ministry of the Environment, Conservation and Parks / Ministry of Natural Resources requirements. Monitoring requirements will be considered and assessed once detailed information regarding the blast designs are available. Based on typical blasts, monitoring would be recommended for quarry blasts within 500 metres of receptors verified to be vibration sensitive.

14.3.3.3 Cultural Heritage

Operational monitoring for this discipline will be further determined based on the results of the Cultural Heritage Evaluation Reports described in **Section 14.1.3.3**.

14.3.3.4 Archaeology

Operational monitoring for this discipline will be further determined based on the results of the Stage 2 and Stage 3 Archaeological Assessment described in **Section 14.1.3.4**.

14.3.3.5 Atmospheric and Greenhouse Gas

The development of best management plans to mitigate fugitive dust generating potential during operations is recommended.

Due to the size of the road network, as well as its geographic location, feasibility / limitations will be present for long-term operations monitoring. It is recommended that consideration of input gathered through other technical monitoring programs specific to potential air quality concerns (in other words, potential dust deposition on vegetation) is completed and evaluated for consideration of future mitigation or monitoring options.

14.3.3.6 Community Well-Being

During operations, the following monitoring programs are proposed:

- The road owner will need to engage with law enforcement to implement increased monitoring of traffic and reckless driving to reduce road safety incidents.
- To address potential effects anticipated during operations, the owner / operator will establish several different working groups with Marten Falls First Nation and Aroland First Nation to meet regularly to discuss community-proposed topics in relation to the Community Access Road. In many cases, these working groups should be established in detail design and then carry through construction and, potentially, into operations.

Access to Clean Water – Water Quality

- During operations, monitoring of water quality, sediment quality, and streamflow conditions at waterbodies that include greater sensitivity or implication to change from the standpoint of fish habitat, Species at Risk, channel stability, drainage pattern, or other environmental considerations. The specific monitoring locations will be determined during the permitting and design stages of the Project; however, it is expected that waterbodies of varying size (small, medium, large) would be captured, recognizing that this would allow the performance / effectiveness of mitigation and enhancement measures to be evaluated Monitoring of surface water quantity and quality parameters will include but not

limited to water taking and discharge rates, pH, total suspended solids, turbidity, temperature, dissolved oxygen, biochemical oxygen demand, and other contaminants of concerns as required). Monitoring of total suspended solids and / or turbidity instrumented measurements and / or visual observations, as well as visual inspections to confirm the presence or absence of oil or sheen;

- An operations groundwater monitoring program to continue the construction monitoring until sites without impacts are decommissioned. Site where impacts to groundwater were observed should continue monitoring until a return to existing equivalent conditions is observed or a site-specific remediation monitoring plan is implemented. Groundwater monitoring should continue at applicable sites used continuously or intermittently during operations, with monitoring starting and ending according to the established construction monitoring programs for the intermittently active sites; and
- During operation, it is recommended that consideration of input gathered through other technical monitoring programs specific to potential air quality concerns (in other words, potential dust deposition on vegetation) is completed and evaluated for consideration of future mitigation or monitoring options. An air monitoring station should be set up in Marten Falls throughout construction and into operations. Air monitoring in the community should have transparency in data to allow sensitive individuals to be aware of levels and remain inside during times of high particulate concentrations.

14.3.3.7 Land and Resource Use

Conduct monitoring measures as outlined in the air quality, noise, visual, surface water, fish, wildlife, and ungulates technical reports to manage impacts related to remote outfitters and recreation (fish and game harvesting) activities.

Monitoring programs should be established to monitor use of the land once the road is operational with respect to collisions and recreation activities (such as, boating, fishing and hunting) so that wildlife and fish populations impacts are monitored and noted during maintenance and rehabilitation. A public reporting systems should be developed to report vehicle-wildlife collisions.

Monitoring and surveying of harvested species should also continue as part of long-term monitoring as increased public access may introduce more hunting and fishing pressures from non-Indigenous hunters and anglers.

For future land development activities that might be facilitated by the Community Access Road, confirm both Marten Falls First Nation and Aroland First Nation are involved in the monitoring process.

14.3.3.8 Visual Environment

Operations monitoring focuses on verification and adaptive management, confirming that long-term visual conditions align with predicted residual effects.

Key Activities:

- Repeat daytime and night photograph sets from photograph point stations during:
  - Commissioning (as-built);
  - End of the first full growing season; and
  - Year 3 of operations;
- Annual (summer) night audits during moonless, clear conditions plus after any fixture changes to verify:
  - Absence of non-task lighting; and
  - No visible skyglow at crossings;
- Observational checks of headlight spill at identified lines of sight (with resident consent), conducted at commissioning and as requested if concerns arise; and
- Preparation of operations visual monitoring reports at the end of Year 1 and Year 3.

If year 3 monitoring confirms that visual contrast and visibility have stabilized within predicted ranges, monitoring may transition to issue-driven monitoring only.

14.4 Future Commitments

Future commitments build upon the information presented in **Sections 14.1** to **14.3** and note where additional work may be required to enhance the monitoring and other commitments described. These commitments included water, land and people but also include commitments made elsewhere within this Environmental Assessment / Impact Statement. These represent items that must be done throughout various stages of the Project. Where it is not described when something will occur, it is expected that it will be an item planned in pre-construction. This plan may include timing that defers the commitment to a later phase.

14.4.1 Water

14.4.1.1 Surface Water

There are no future commitments for surface water.

14.4.1.2 Fish and Fish Habitat

There are no future commitments for fish and fish habitat.

14.4.1.3 Groundwater and Geochemistry

There are no future commitments for groundwater and geochemistry.

14.4.1.4 Peatlands

The effectiveness of mitigation measures will be evaluated during construction and operations and will be modified or enhanced as necessary through adaptive management.

A Preliminary Biodiversity Offset Plan (**Appendix AB**) has been developed and will be implemented for the Project to provide a net positive increase in wetland habitat (**Appendix AB**). The specific approach will be determined through consultation with Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, but will generally follow a hierarchy of restoration, reclamation and offset alternatives (such as financial compensation directed towards wetland research or inventory work to fill existing information gaps). The Preliminary Biodiversity Offset Plan will focus on activities within the same ecoregions as the Project (in other words, Ecoregions 2W and 2E), to the extent feasible, followed by opportunities available in adjacent ecoregions (such as Ecoregions 1E, 3W, and 3E) or other ecoregions where wetland ecosystems are rare (such as Ecoregion 6E or 7E) and offset activities may provide a larger overall benefit.

14.4.2 Land

14.4.2.1 Vegetation

The effectiveness of mitigation measures will be evaluated during construction and operations and will be modified or enhanced as necessary through adaptive management.

A Preliminary Biodiversity Offset Plan (**Appendix AB**) has been developed and will be implemented for the Project to provide a net positive increase in wetland habitat. The specific approach will be determined through consultation with Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, but will generally follow a hierarchy of restoration, reclamation and offset alternatives (such as financial compensation directed towards wetland research or inventory work to fill existing information gaps). The Preliminary Biodiversity Offset Plan will focus activities within the same ecoregions as the Project (in other words, Ecoregions 2W and 2E), to the extent feasible, followed by opportunities available in adjacent ecoregions (such as Ecoregions 1E, 3W, and 3E) or other ecoregions where wetland ecosystems are rare (such as Ecoregions 6Eor 7E) and offset activities may provide a larger overall benefit.

14.4.2.2 Wildlife

- The effectiveness of mitigation measures will be evaluated during construction and operations and will be modified or enhanced as necessary through adaptive management. A Preliminary Biodiversity Offset Plan (**Appendix AB**) has been developed and will be included in the final report submission. Offsetting measures will be implemented for the Project to provide a net positive outcome for little brown myotis, northern myotis, wolverine, and wetland habitat that provides amphibian breeding habitat. The Offset Plan will be developed following engagement and consultation with Indigenous communities, Environment and Climate Change Canada, and Ontario Ministry of the Environment Conservation and Parks; and
- A proactive outreach and education program aimed at increasing awareness of the presence of wolverine within the area, the potential effects of incidental trapping on wolverine populations, and effective mitigation measures that reduce the likelihood of incidental wolverine trapping as outlined in Best Management Practices to Avoid Wolverine (Ontario Fur Managers Federation, 2018) will be developed and implemented.

14.4.2.3 Birds

The effectiveness of mitigation measures will be evaluated during construction and operations and will be modified or enhanced as necessary through adaptive management.

A Preliminary Biodiversity Offset Plan (**Appendix AB**) has been developed and will be implemented for the Project to provide a net positive increase in migratory bird habitat. As part of the Preliminary Biodiversity Offset Plan, primary themes to provide a net

positive for migratory birds include designing surveys as part of the operation monitoring program to be in-line with existing citizen science programs and undertaking land acquisition, including outside of the primary study area that benefits over-wintering migratory birds found in the Project Study Area. Additional survey requirements for bird Species at Risk will be determined through correspondence and potential permitting with Environment and Climate Change Canada and Ontario Ministry of the Environment, Conservation, and Parks.

14.4.2.4 Ungulates

The effectiveness of mitigation measures will be evaluated during construction and operations and will be modified or enhanced as necessary through adaptive management.

- A Preliminary Biodiversity Offset Plan (**Appendix AB**) has been developed and implemented for the Project to provide a net positive increase in caribou functional habitat. The Offset Plan will be developed following engagement and consultation with Indigenous communities, Environment and Climate Change Canada, and Ontario Ministry of Environment Conservation and Parks.

14.4.2.5 Physiography, Terrain, and Soils

The effectiveness of mitigation measures will be evaluated during construction and operations and will be modified or enhanced as necessary through adaptive management.

14.4.3 People

14.4.3.1 Aboriginal and / or Treaty Rights and Interests

The effectiveness of mitigation and enhancement measures will be evaluated during construction and operations and will be modified or enhanced as necessary through adaptive management.

14.4.3.2 Acoustic and Vibration Environment

The effectiveness of mitigation and enhancement measures will be evaluated during construction and operations and will be modified or enhanced as necessary through adaptive management.

14.4.3.3 Cultural Heritage

Future Commitments for this discipline will be further determined based on the results of the Cultural Heritage Evaluation Reports described in **Section 14.1.3.3**.

14.4.3.4 Archaeology

Future commitments for this discipline will be further determined based on the results of the Stage 2 and Stage 3 Archaeological Assessment described in **Section 14.1.3.4**.

14.4.3.5 Atmospheric and Greenhouse Gas

There are no future commitments for atmospheric and greenhouse gas.

14.4.3.6 Community Well-Being

The effectiveness of mitigation measures will be evaluated during construction and operations and will be modified or enhanced as necessary through adaptive management.

14.4.3.7 Land and Resource Use

As a component of all phases of the Project, it is recommended that where possible Marten Falls First Nation and Aroland First Nation are included in the monitoring of other future land development activities that might be facilitated by the road.

14.4.3.8 Visual Environment

Future commitments confirm that visual environment mitigation and monitoring remain actionable and auditable through design, construction, and early operations.

14.5 Future Permits and Approvals

A comprehensive list of future permits and approvals is provided in Appendix AA. A brief summary is included below:

- *Endangered Species Act* permitting consultation with Ministry of the Environment, Conservation and Parks will be required for the following species: Bats (little brown myotis and northern myotis), and wolverine;
- The aggregate pits and quarries that are proposed through the Community Access Road will be subject to permitting requirements outlined within the

Ontario *Aggregate Resources Act* and its regulations. For a permit to be issued, additional studies, mitigation plans, consultation and monitoring commitments may be required. In addition to permitting requirements under the Ontario *Aggregate Resources Act*, permitting and approvals under other pieces of legislation may also be required for pit and quarry development, including:

- Ontario *Planning Act*;
- *Ontario Water Resources Act*;
- *Environmental Protection Act*;
- *Endangered Species Act*; and
- *Species at Risk Act*.

15. Summary and Recommendations

15.1 The Community Access Road

The Community Access Road will consist of the road itself, associated access roads, rest areas / pull outs, bridges, culverts, pits, and quarries:

- Approximately 184 kilometres of all-season gravel road of which 8 kilometres will be within Marten Falls;
- Bridge and / or culvert installations for river and stream crossings;
- Right-of-way, approximately 100 metres wide, cleared to a width of 60 metres;
- Two-lane roadway, approximately 12 to 13 metres wide;
- Posted speed limit of 80 kilometres per hour;
- Culverts to maintain water flow connectivity and balance water levels;
- Pits and quarry sites;
- Temporary access roads and construction of temporary crossings;
- Temporary work areas and camps, and
- Road maintenance facilities, rest stops, and pull-out areas.

The Final Environmental Assessment / Impact Assessment was completed on a preliminary design of the road, which means that the details on how the Community Access Road will be built are still conceptual and are presented only at a high level.

15.2 Existing Conditions and Effects Assessment

Environmental studies, both desktop and field, were completed by the technical disciplines to document and assess the existing conditions. A total of 18 technical disciplines are considered in the Final Environmental Assessment / Impact Statement. These were grouped into water, land and people. Each technical discipline used existing conditions information alongside the description of anticipated construction and operations activities. This was used to determine the potential interactions between the Community Access Road and the environment. After the potential interactions were determined, potential effects were identified, and strategies to avoid or mitigate the negative effects were examined. Mitigations are strategies to reduce the potential negative effects on the environment.

Through the proper use of mitigation measures (**Appendix AA**), the potential negative effects from the construction and long-term use of the Community Access Road are

expected to be effectively managed, minimized, or mitigated. The Community Access Road is also expected to realize positive benefits for the community of Marten Falls. From an environmental perspective, the Marten Falls First Nation supports the Community Access Road.

15.2.1 Water

Despite mitigation, significant residual effects are expected:

Peatlands: Residual changes to peatland ecosystems due to changes to groundwater that may alter drainage patterns, groundwater regimes, or groundwater quality. Direct habitat loss (less than 1 percent regionally) and potential changes to groundwater or drainage patterns. Effect severity is moderate due to vulnerability (ecosystem of conservation concern) and irreplaceability (common in this landscape, but limited ability to restore functional peatland ecosystems).

15.2.2 Land

Despite mitigation, significant residual effects are expected on terrestrial Key Biodiversity Components:

- **Boreal Caribou**: loss of Category 1 habitat, sensory disturbance, linear barrier effects, increased access-related mortality risk, and collision potential. Effect severity is high because of vulnerability (Threatened species) and irreplaceability.
- **Wolverine**: habitat removal, sensory disturbance, incidental take, increased access, and potential for vehicle collisions. Effect severity is high because of vulnerability (Threatened species) and irreplaceability.
- **Little Brown Myotis and Northern Myotis**: removal of roost habitat, sensory disturbance, minor collision risk. Effect severity is high because of vulnerability (Threatened species) and irreplaceability.
- **Migratory Birds (including Species at Risk)**: habitat loss, sensory disturbance, and increased edge habitat. Effect severity ranges from low (for non-SAR species), moderate for Special Concern species, and high for Threatened / Endangered species.
- **Raptor Species at Risk**: habitat loss and sensory disturbance. Effect severity is high for Short-eared Owl (Threatened species) and moderate for Bald Eagle (Special Concern species).

A precautionary ecological risk ranking approach identifies boreal caribou, wolverine, Species at Risk bats, and Threatened / Endangered migratory birds as high-priority components requiring offsetting. Peatlands, bald eagle, and special concern migratory birds are considered to have a moderate ecological risk ranking, and will benefit from offsetting approaches implemented for the high-priority Key Biodiversity Components.

15.2.2.1 Offsetting Approach

Offsets are applied as the final step in the mitigation hierarchy and must aim for no net loss, or preferably net positive impact, on biodiversity. Offset planning considers equivalency, additionality, timing, duration, location, and accountability, consistent with federal policy, provincial requirements, and international Business and Biodiversity Offsets Program principles.

15.2.3 People

The Community Access Road presents an opportunity for improved connectivity, economic growth, and long-term resilience for Marten Falls First Nation and surrounding communities. While the Project brings key benefits such as improved accessibility, lower costs for essential goods and services, and increased employment and business opportunities, it also introduces challenges that require careful management. By implementing proactive mitigation measures and ongoing monitoring, the Project aims to balance economic development with cultural preservation and environmental sustainability, allowing for future generations to benefit from a more connected community.

Aboriginal and Treaty Rights and Interests: The Project will enhance access and connectivity within the Local Study Area and to remote regions and expand access to sites and areas that support traditional land and resource use, including hunting, gathering, trapping, fishing, and areas for ceremonial and cultural practices. This improved connectivity to traditional harvest areas, ceremonial and teaching places reinforces cultural practices and intergenerational knowledge transfer while enhanced access to the land for traditional foods can bolster food security and sustain community food sharing.

Community Well-being: Key positive effects include improved accessibility to and from Marten Falls, leading to small increases in on-reserve population, positive effects on productivity and economic growth, and sustained tax revenues. During construction, employment opportunities may lead to an increase in the working-aged population, and potentially altering the gender balance within Marten Falls First Nation and Aroland First

Nation. Increased employment could encourage off-reserve members to return, leading to an increase in the on-reserve population in the communities. There will be increased employment and business opportunities for local and Indigenous workers and companies during construction, contributing to the creation of approximately 8,600 jobs in Ontario, increasing economic activity and providing high earnings for individuals. Construction will lead to increased tax revenues.

During operations, employment and business opportunities may also increase in the community, creating long-term economic growth. Year-round access will also reduce the cost of essential goods such as bottled water and building materials, making everyday necessities more affordable. Additionally, improved connectivity to the region and increased transportation options will create new opportunities for local businesses, employment, and community development, contributing to long-term resilience.

Land and Resource Use: The Project will enhance access to the remote lands and water resources, potentially resulting in increased recreation activity opportunities such as hunting and fishing. Populations of furbearers in the larger area are not predicted to be affected by the Project and improved access to the area may benefit trapping activities. Finally, the road corridor, once established, may facilitate future mining and energy development opportunities.

Despite mitigation, significant residual effects are expected on some key components:

Atmospheric Environment: The air quality assessment identified impacts from dust (particulate matter 2.5 micrometres, particulate matter 10 micrometres and total suspended particulate matter) to be significant. It should be noted that the air quality assessment considered no dust suppression mitigation measures, which is a very conservative approach. With this in mind, the Community Access Road has the potential to negatively affect air quality due to road dust emissions. However, applying mitigation methods can result in up to an 80% reduction of dust.

Community Well-being: The Project has the potential to negatively affect mental health and overall well-being through several interconnected pathways, including reduced connection to the land and changes in sense of place and identity associated with the presence of the road. Additional concerns include the possibility of increased substance use due to easier access to drugs and alcohol, as well as a reduction in the availability of traditional foods resulting from construction-related disturbances, overharvesting, and broader environmental pressures linked to the road. There is also a potential negative effect on the quality of traditional foods due to possible contamination.

15.3 Consultation

Marten Falls First Nation has been consulting and engaging on the Community Access Road with Indigenous communities, interested persons, and government agencies since 2019.

Relationship building has been at the core of consultation and engagement efforts. Over the years, progress has been made to establish lines of communication, increase active participation, and satisfy / resolve concerns and issues. Progress has also been made to host Council-to-Council meetings between Marten Falls First Nation and other Indigenous communities (for example, Eabametoong First Nation and Aroland First Nation) to discuss relationship protocols, approaches for meaningful consultation and engagement, and to provide updates related to the Community Access Road.

15.4 Recommendation

The Community Access Road will connect Marten Falls to Ontario's main highways, making travel safer and allow families to visit one another more easily. It will help lower the cost of food, fuel, and other supplies while improving community services such as health care, education, and wellness. The Community Access Road will also create new opportunities for the Community to grow and flourish.

As a multi-purpose road, it can also increase economic opportunities for Indigenous communities and others. The Community Access Road is anticipated to create jobs during construction and through operations. Additionally, it will provide Marten Falls First Nation members with access to employment opportunities, as they will be able to reliably commute to work year-round.

The Community Access Road will not solve all the Community's challenges, but it does represent a step in a positive direction. It opens the door to new opportunities to grow as a community and offers hope for a better future. As Chief Achneepineskum puts it, "It is not just a path to progress; it is a testament to our resilience, our vision for the future and our commitment to the well-being of our people." From a community point of view, Marten Falls First Nation supports the Community Access Road.

Environmental impacts from the Community Access Road to water, land, and people will be mitigated through monitoring programs and future commitments, as described in **Section 14**. Marten Falls First Nation recommends proceeding with the approval of the Community Access Road, considering its positive effects, monitoring programs, mitigation measures and future commitments.

Marten Falls First Nation looks forward to continuing the conversation on next steps throughout the Assessment Process.

16. References

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