

**Regional Assessment in the Ring of Fire Area
Federal Authority Advice Record**

Response due to IAAC.RegionalRoF-CdFRegionale.AEIC@Canada.ca by January 22, 2021

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PART 1 – *In providing your responses to the items below, please include any relevant information on associated Indigenous, public or other consultation or engagement activities and identify any partners or collaborations.*

1. MANDATE AND AREA(S) OF EXPERTISE

Clearly outline the mandate of your department or agency and detail your area(s) of responsibility or expertise that may be related to the regional assessment

Natural Resources Canada (NRCan) works to improve the quality of life of Canadians by ensuring that our natural resources are developed sustainably, providing a source of jobs, prosperity and opportunity, while preserving our environment and respecting our communities and Indigenous peoples.

NRCan is an established leader in the fields of:

- Natural hazards, including earthquakes, landslides and flooding
- Land based geology
- Groundwater and hydrogeology
- Geochemistry, acid rock drainage and metal leaching
- Extraction, processing and environmental management of mineral resources
- Forest ecology, biodiversity and management

2. **REGULATORY AUTHORITIES**

List and summarize the nature of the regulatory authorities of your department or agency in relation to physical works or activities in the Ring of Fire area.

Natural Resources Canada administers the *Explosives Act* and the *Explosives Regulations, 2013* and may exercise a power, duty or function related to the manufacturing and/or storage of explosives associated with Ring of Fire development.

Under section 6 of the *Explosives Act*, it is prohibited to make or manufacture any explosive, either wholly or in part, except in a licensed factory or to store any explosive in a magazine that is not a licensed magazine. Under subsection 7 (1)(a), however, the Minister of Natural Resources may issue licences for factories and magazines. Mine developments, for instance, typically include a bulk explosives plant which operate under a Division 1 factory licence.

3. **EXPERT INFORMATION OR KNOWLEDGE**

List and summarize the specialists or expert information or knowledge that your department or agency has that may be relevant to the regional assessment. Include all research, reports and data sets in this response inventory.

Natural Resources Canada has specialist or expert information or knowledge relevant to the regional assessment in the domains listed below. It should also be noted that specialist expertise and knowledge relevant to natural resources may be held by other federal and provincial partners, reflecting the shared jurisdiction for natural resources within Canada.

- **Forest and Forestry**

- **Hydrology of forest areas:** Description of potential impacts of projects on the hydrology of surrounding watersheds (surface waters) and description of mitigation measures.
- **Species at risk habitat (including woodland caribou):** Description of potential impacts of projects on habitat and vegetation of caribou; loss of habitat area and quality; changes in predator movements due to habitat modification, and identification of mitigation measures.
- **Forest Vegetation and Biodiversity:** Description of potential changes in soil quality, loss, compaction, erosion, etc. that could lead to a reduction in soil productivity, including methods used to clear trees and shrubs as well as potential impacts on biodiversity and species of cultural value.
- **Change of use and recovery of forested land:** Description of how projects may impact the change in land use, potential impacts, identification of mitigation measures and remediation.

- **Geology and Hydrogeology**

- **Geology:** Description of the nature of the superficial formations and their depth, the nature of the bedrock, geohazards, permafrost occurrence, processes and stability;
- **Groundwater Quantity:** Description of potential project impacts on groundwater and mitigation measures and hydrogeological modelling;

- **Explosives Manufacturing and Storage:**
 - Assessment and licensing for the storage and manufacture of explosives.
- **Minerals and Mining**
 - **Acid drainage and metal leaching:** Description of potential and potential impacts of acidic mine drainage and metal leaching of mining waste, including geochemical characterisation and prevention and control technologies
 - **Mine wastes:** Management and disposal of mine wastes including mine water, processing effluent, waste rock, tailings and sludge;
- **Mining Economics**
 - **Socio-economic Impacts:** Description of how a project will change the economic environment and its impact on the social interactions and structures.
 - **Labour Market:** Description of how a project will have an impact on the local labour market.
 - **Local Economic Impacts:** Description of positive impacts (including new economic opportunities) and negative impacts of projects on the local economy and the local population.
 - **Supply chain:** Description of projects impacts on the supply chain (local and global).
- **Earth Observation and monitoring**
 - **Baseline data:** development of baseline data describing the status and trends of ecosystem parameters (biosphere, hydrosphere and cryosphere) across the Canadian landmass.

4. *POLICIES, PROGRAMS OR INITIATIVES*

List and summarize the past, current and planned policies, programs or initiatives of your department or agency that may be relevant to the regional assessment. Include an outline of related funding initiatives in this response and provide information on geographic locations, next steps and timing for the program/initiative.

A list of past, current and planned policies, programs and initiatives that may be relevant to the regional assessment is provided below:

- At CanmetMINING, the Chromite Research and Development program within the Green Mining Innovation division undertakes research to investigate the potential environmental impact of chromite (Cr) mining in the Ring of Fire area. To date, research has been done on the potential Cr-leaching and oxidation potential of model mine tailings associated with chromite mining, a life-cycle assessment on potential mining and smelting operations for Ring of Fire chromite, including GHG emission estimates from planned mining operations, as well as a literature review on the interaction of Cr-bearing dusts with peatlands. Research into the potential for Cr(VI) generation during mine blasting is planned.
- At the Geological Survey of Canada (GSC), under the Environmental and Groundwater Geoscience Program, a project is underway to establish geo-

environmental characteristics of regions with high potential of natural resources development such as the Ring of Fire.

The GSC also has expertise pertaining to regional geology and compilation of surface exposures and diamond-drill core following work that was carried out between 2010 and 2014 in the Ring of Fire area in coordination with the Ontario Geological Survey (OGS). This work was carried out by the GSC under the Targeted Geoscience Initiative. Two references related to this work:

1. Metsaranta, R.T. and Houlé, M.G. 2017. Geochronology, mineral deposit, drill-core relogging and drill-core compilation data from the Winiskisis Channel, McFaulds Lake and Highbank Lake areas, “Ring of Fire” region, northern Ontario; Ontario Geological Survey, Miscellaneous Release—Data 343.
 2. Metsaranta, R.T. and Houlé, M.G. 2020. Precambrian geology of the McFaulds Lake “Ring of Fire” region, northern Ontario; Ontario Geological Survey, Open File Report 6359, 260p.
- The Open Science and Data Platform (OSDP) is one of four key elements of the federal governments approach to cumulative effects, announced in 2018 as part of the changes to impact assessment and related regulatory processes. The Government of Canada is investing resources over five years (2018-2023) in a number of federal initiatives aimed at providing better data and tools to support cumulative effects assessment and better access to cumulative effects science and data to support natural resource development. The OSDP provides access to environmental data and scientific publications that can be used to understand the cumulative effects of human activities. The OSDP leverages existing systems e.g, Federal Geospatial Platform, Canadian Impact Assessment Registry, as well as resources within Natural Resources Canada (NRCan), Environment and Climate Change Canada (ECCC) and other partners. By leveraging these resources, the OSDP’s information offering provides enhanced access to federal, provincial and territorial data, historical time series data and maps, surveys, satellite Earth observations and scientific models, and development and assessment activities. NRCan co-leads the OSDP in collaboration with Environment and Climate Change Canada (ECCC).
 - Canada Centre for Mapping and Earth Observation (CCMEO), jointly with the development of the OSDP, is leading activities to develop foundational baseline data describing the status and trends of ecosystem parameters (biosphere, hydrosphere, and cryosphere) across the Canadian landmass and supporting the integration of these data into project and regional assessments.
 - The Canadian Forest Service (CFS) provides a national perspective and expertise on forest issues and undertakes long-term, large-scale research and data collection focusing on complex challenges that require multilayered responses. CFS is committed to providing science and technical analysis, including collecting data, collating and harmonizing existing national forest data sets that have already been collected by other organizations and provincial and territorial (P/T) partners, identify relevant gaps in the existing baselines and monitoring, and fund and coordinate P/T field data collation to fill these gaps. Canada’s National Forestry Inventory assesses and monitors the extent, state, and sustainable development of Canada’s forests and includes traditional forest inventory attributes and a

framework for collecting additional data relevant to sustainable development, forest health, biodiversity and forest productivity. So far, CFS has initiated projects that have a potential transferrable research expertise to contribute to Regional Assessments, including:

- Analyzing cumulative ecological and socioeconomic effects of forest management, natural disturbance, and climate change in Ontario's managed forests
- Targeting forest reclamation practices and developing indicators designed to protect and restore water resources and maximize carbon capture in a cumulative effects landscape
- Developing a flexible tool for predicting cumulative effects on forest water resources
- Developing a sustainability assessment of mine-affected Indigenous communities, including holistic model to impacts

A list of past, current and planned funding programs that may be relevant to the regional assessment is provided below:

Indigenous Forestry Initiative (IFI)

Ne-Daa-Kii-Me-Naan Inc. (Nedaak)

\$150,000 from 2018-19 to 2019-20

NRCan contributed to Nedaak, a forest management company owned by 7 First Nation communities, four of which are from Matawa First Nations in the Ring of Fire (Constance Lake, Long Lake, Aroland and Ginoogaming). This investment was increased by an additional \$100,000 in 2019-20, for a total investment of \$150,000. The 2019-20 investment is supporting business planning for expanded operations, building on the economic development opportunities scan funded by IFI in 2018-19. The Business Expansion project will expand Nedaak's role in the forest sector through vital skill development and training to support forest operations, including building partnerships and the transfer of knowledge and responsibility to local First Nations.

Agoke Development Limited Partnership

\$500,000 in 2019-20

NRCan contributed in 2019-20 to Agoke Development Limited Partnership, a First Nation's owned and operated company that is responsible for the sustainable management of the Ogoki Forest and developing economic opportunities for the First Nations of Aroland, Eabametoong and Marten Falls in the Ring of Fire. Through this project, the ADLP will establish the Anishnawbe Workforce Development Maintenance Program that will recruit First Nations people and provide them with training and technical skills in order to participate in the forest sector labour force; specifically to place workers into the Nakina sawmill.

Clean Energy for Rural and Remote Communities (CERRC)

Eabametoong and Neskantaga First Nation — Clean Energy Opportunities Plan

\$660,000 from 2021 to 2023.

EFN and NFN have partnered to implement a vision of local and regional community development built upon dialogue and new knowledge networks as we consider steps toward a diesel-free energy future. By combining community-based dialogue and Indigenous knowledge with technical and academic knowledge leaders, we are

pioneering a new approach to involving our membership in the active planning of opportunities for the near and long-term benefit of our people.

Fort Severn First Nation — Power at the Margins

\$865,817 from 2019 to 2023.

This project aims to reduce the need for diesel-generated electricity and boost the reliability of energy systems in the remote Ontario community of Fort Severn First Nation, fostering health, environmental, and financial benefits to the community. The project includes the installation of 290 kW solar panels and a 10 kW wind turbine, and incorporates a training program for community members to support the construction, operations, and management of the project.

Kiashke Zaaging Anishinaabek/Gull Bay First Nation — Microgrid project

\$2M completed from 2018 to 2020

Provided support to Ontario Power Generation to demonstrate the integration of a 300-kW high-penetration solar photovoltaic system into the existing diesel microgrid in Kiashke Zaaging Anishinaabek / Gull Bay First Nation, along with 550kWh of battery energy storage and controllers. This project offsets approximately 170,000 litres of diesel fuel and 471 tonnes of CO2 emissions per year.

Matawa First Nations Management (Eabametoong, Marten Falls, Neskantaga, Nibinamik & Webequie) — Building Energy Literacy

\$262,000 from 2020 to 2023.

Matawa First Nations Management will partner with Relay Education to increase energy literacy in 5 remote Matawa First Nations communities (Eabametoong, Marten Falls, Neskantaga, Nibinamik and Webequie). We will train 3 members of each community to have the capacity to increase energy literacy amongst youth, elders and other members of the community. This will be achieved by: Facilitating renewable energy and energy conservation workshops; organizing and facilitating clean energy literacy; tailoring existing educational content to local culture and realities; educating community members in renewable energy technology, clean energy careers; and career mentorships.

Nishnawbe Aski Nation (Wapakeka First Nation, Nibinamik First Nation, Kitchenuhmaykoosib Inninuwug and Eabametoong First Nation, two other communities TBD)

\$2,532,000 from 2019-20 to 2021-22

The project will exchange existing woodstove heating appliances in six remote Nishnawbe Aski Nation communities with upgraded high efficiency woodstoves and will reduce fossil fuel heating use by lowering demand on community electricity supply, currently provided by diesel generators. The project will provide training opportunities and will increase capacity in each community to participate in the bio-economy. The project is expected to create 13 temporary full-time positions for the duration of the project and 18 part-time positions ongoing for operation and maintenance and firewood harvesting and processing.

Opiikapawiin Services LP — Energizing Youth

\$400,000 from 2018 to 2024.

Opiikapawiin Services LP will design and develop a capacity building program for youth (ages 18 to 25) from 22 remote First Nations communities in Ontario. The six-week program will include intensive training and skill building, for 5 participants, in July and August each year for six years. The program will build energy literacy and a skilled labour

force -- critical for employment in the energy sector, and specifically, for the Wataynikaneyap Transmission project.

Opiikapawiin Services LP — Plugged into a Brighter Future

\$208,223 from 2019 to 2022.

This project aims to include interactive and hands-on workshops, targeting Indigenous youth ages 9-14 in 3 rural and 17 remote diesel-dependent communities with the Wataynikaneyap Power project, to provide them with avenues to build energy capacity and knowledge in their communities, enable participation in energy efficiency and conservation discussions, as well as increase community social and economic development.

Whitesand First Nation — Sagatay Cogeneration LP

\$4.168M from 2019-20 to 2020-21

Sagatay will develop all engineering drawings and plans for a biomass cogeneration system to provide heat and electricity for the Whitesand Pellet Mill. The implementation of the project for which NRCan is funding the engineering, will create local employment and some energy independence for the community.

Whitesand and Muskrat Dam First Nations — Regional Community Energy Plan

\$442,900 from 2019 to 2022.

The Independent First Nations Alliance will partner with Mohawk College to create an online tool that can streamline the Regional Community Energy Plan process by increasing ownership of the process at the First Nations Tribal Council level, as well as First Nations energy capacity building by having First Nations organizations co-lead the development and implementation of the process.

5. *Outline any additional responsibilities, information or knowledge and any partners or collaborations that have not been specified, above.*

NRCan scientists have established relationships with scientists working at the Ontario government and with different Universities such as Lakehead University, University of Guelph and University of Waterloo.

PART 2 – *To contribute to the design of the regional assessment process and development of the terms of reference, please provide information or advice in relation to the items below.*

1. *Potential outcomes of the regional assessment*

NRCan has outlined below some of aspects of a regional assessment that it deems important. This list is meant as an overview of these important aspects, not as an exhaustive list, while keeping in mind the NRCan's expertise and science.

Data Gathering / Trend Analysis

- Mapping of landforms, wetlands, vegetation changes, geology, environmental geochemistry, groundwater and surface water modelling
- Provide socioeconomic and economic baseline data and analysis to support future project-level analysis

- Ecosystem modelling that can be updated and verified with monitoring results (to improve our understanding of the risks and impacts of cumulative effects on forest ecosystems using different tools (e.g., Spatial Discrete Event Simulation (SpaDES) modelling, BOWTIE risk assessment)
- Provide an understanding of long term monitoring needs and associated capabilities to fill gaps and determine trends; aid analysis; inform project-level assessments; and aid economic recovery in post COVID era

Setting Thresholds / Standard Mitigation

- Provide a risk assessment and analysis for woodland caribou habitat, and other species at risk in the region

Regional Development Planning

- Plan an Indigenous-led, co-developed, long-term monitoring program to fill gaps in baseline data, extend datasets temporally, assess impacts for identified value components and inform local, provincial and federal decision makers
- Include in this plan, opportunities for the co-development of research between the Government of Canada and Indigenous groups

2. Relevant geographic and temporal boundaries

Based on NRCan's expertise that spans across biophysical and social sciences, we have identified key characteristics of the relevant geographic and temporal boundaries for the regional assessment of the Ring of Fire region. Namely, NRCan may provide to the Agency the following advice:

- Different geographic and temporal boundaries may be needed for biophysical and socio-economic domains. Similarly, different components of the biophysical and socio-economic domains might also require different boundaries (for example, different species at risk such as the wolverine, the woodland caribou or the polar might have different habitat requirements and ranges)
- The biophysical domain should include the five watersheds associated with Ring of Fire mineral deposits: Attawapiskat, Ekwan, Lower Albany, Upper Albany and Winisk (see Figure 1)
- The socio-economic domains should include the First Nations associated with the Mattawa Tribunal council (located across the Ring of Fire mineral deposit) and the First Nations associated with Mushkegowuk Tribunal Council, which is located downstream of the Ring of Fire mineral deposit

3. Factors to be considered in the regional assessment and the scope of those factors;

NRCan supports the factors considered in the Impact Assessment Act, which states, among other aspects, that:

“the changes to the environment or to health, social or economic conditions and the positive and negative consequences of these changes that are likely to be caused by the carrying out of the designated project, including:

- the effects of malfunctions or accidents that may occur in connection with identified potential designated projects;
- any cumulative effects that are likely to result from the identified potential designated project in combination with other physical activities that have been or will be carried out; and
- the result of any interaction between those effects.”

More specifically, NRCan supports consideration of these factors in the regional assessment, including:

- Fish and fish habitat, effects of climate change on water levels, forest fire, and land cover, importance of peatlands in carbon storage, water cycle and hydrology
 - NRCan can support these federal jurisdictions through its hydrogeological and hydrological data collections and modelling as input for baseflow quantity and other hydrological indicators to streams, rivers and wetlands. These research efforts will enhance understanding of the surface water bodies that support fish and fish habitat in the Ring of Fire region
- Rights of Indigenous peoples and moving forward with reconciliation
 - NRCan can support this federal duty through ongoing engagement with local Indigenous people and research opportunities
- Species at Risk including: polar bears, wolverines, woodland caribou and sturgeon
 - NRCan can support this federal jurisdiction through its expertise in forest ecology, biodiversity and management of critical habitat for woodland caribou, among other species
- Socioeconomic and economic structures and status.
 - NRCan can support this federal jurisdictions through its expertise in mineral and mining economics

4. Means of communication and engagement that would best facilitate participation of your department or agency in the regional assessment.

In terms of means of communication, the current methods between NRCan and IAAC are working and should be maintained.

For engagement with our Indigenous partners, NRCan would like to note that further efforts to coordinate Indigenous engagement across government departments could be beneficial to the regional assessment. Collective, departments may benefit from using more social media communication for Indigenous engagement, given travel restrictions impacted by COVID-19.

5. Input or advice on any other aspect of the regional assessment.

NRCan is looking for ways to collaborate or co-create our research projects with Indigenous jurisdictions, including data sharing agreements with Indigenous knowledge holders. In conjunction with NRCan's scientific and technological expertise, this can inform project-level and regional impact assessments. Assessments grounded in western science, technical expertise and Indigenous knowledge can, in turn, enable more responsible and informed decision-making for natural resource projects. This will help Canada's approach in addressing cumulative effects while ensuring natural resource projects are developed in an environmentally responsible and inclusive manner.

Similarly, NRCan is committed to open science and open governments for all Canadians. Open government plays a critical role in ensuring citizens are served by their governments in ways that are responsive, efficient and fair. It connects people to the governments who serve them, and helps make policies and services more citizen-centred. In the context of the Ring of Fire regional assessment, open science is a keystone to provide science that can inform future planning and future project impacts assessment in the region.

Figure 1: Five watersheds associated with Ring of Fire mineral deposits
(Estimated area of 291,000 km²)

