REVIEW COMMITTEE (COMEX)

Environmental and Social Impact Assessment Review Report on the Whapmagoostui-Kuujjuaraapik Hybrid Power Plant Project by Kuujjuaraapik Whapmagoostui Renewable Energy Corporation

June 2022

TABLE OF CONTENTS

PROJECT REVIEW

1. INTRODUCTION

The communities of Whapmagoostui and Kuujjuaraapik are currently supplied with electricity by a diesel power plant with an installed capacity of 3.41 MW operated by Hydro-Québec Distribution. The goal of the Whapmagoostui-Kuujjuaraapik Hybrid Power Plant Project (hereafter "WKHPPP") by Kuujjuaraapik Whapmagoostui Renewable Energy Corporation 9415-1610 Québec Inc. (hereafter "the proponent") is to supplement the current power supply using a local renewable source of energy, while maximizing economic benefits and job creation for local communities and contributing to the reduction of greenhouse gas (GHG) emissions.

The Evaluating Committee (COMEV) received the preliminary information for the WHKPPP on August 10, 2020. COMEV deemed it necessary to submit the project to the environmental and social impact assessment and review procedure, in accordance with section 159 of the *Environment Quality Act* (EQA, chapter Q-2) and paragraph 22.5.14 of the *James Bay and Northern Québec Agreement* (JBNQA). Consequently, on April 23, 2021, the Review Committee (COMEX) received the environmental and social impact assessment prepared by the proponent of the WKHPPP. On July 28, 2021, COMEX sent questions and comments in respect of the environmental and social impact assessment to the Regional Administrator for Section 22 of the JBNQA. After reviewing the proponent's responses to the questions, sent on August 23, 2021, COMEX announced that a public hearing would be held for the project on January 26, 2022. However, due to public health restrictions related to the COVID-19 pandemic, COMEX announced in a letter dated January 18, 2022, that the public hearing, to be conducted in a hybrid format, was being postponed until February 23, 2022.

2. CONTEXT AND BACKGROUND

La Grande Agreement (1986) stipulates the need for reliable electricity services to all Cree communities and the connection of Cree electrical installations to the Hydro-Québec power grid. The *Whapmagoostui Transmission Line Agreement* signed in 2002 as part of the *Agreement Concerning a New Relationship Between the Gouvernement du Québec and the Crees of Québec* reiterated the commitment to connect the community of Whapmagoostui to Hydro-Québec's main power grid as soon as possible.

The communities of Whapmagoostui and Kuujjuaraapik are currently supplied with electricity through one of the 22 off-grid systems not connected to the Hydro-Québec distribution network, namely a diesel power plant with an installed capacity of 3.41 MW operated by Hydro-Québec Distribution. In addition to being expensive to operate, diesel plants contribute a significant amount of GHG emissions.

Hydro-Québec's 2020-2024 *Strategic Plan* includes the conversion of its off-grid systems to cleaner, cheaper sources of energy, with the aim of achieving 70% renewable supply overall by 2025. The WKHPPP is in line with this energy transition and meets Hydro-Québec's project criteria for integrating renewables into its off-grid systems: reduced GHG emissions, a reliable power supply, environmental and social acceptability, and lower supply costs.

3. PROJECT DESCRIPTION

The project description is drawn from the information contained in the proponent's environmental and social impact assessment reports, additional documents submitted to the Regional Administrator, the applicable regulations and the documents submitted in the context of the public hearing. That information provides the basis for the project review process and subsequent recommendations.

3.1 Presentation of the Proponent

The proponent of the WKHPPP is the result of a joint equal partnership between the Eeyou of Whapmagoostui and the Inuit of Kuujjuaraapik, who formed Kuujjuaraapik Whapmagoostui Renewable Energy Corporation (KWREC) in 2020. Partners include Nimschu Iskudow Inc., the Sakkuq Landholding Corporation, Ikayu Energy and TCI Group (Transelec/Common Inc.).

Nimschu Iskudo was incorporated in 2012. Its main business sectors are the production and distribution of electricity. It is majority owned by the Whapmagoostui First Nation and minority owned by Tawich Development Corporation, which is owned by the Wemindji First Nation. Nimschu Iskudo's mission is to research and develop hybrid renewable energy projects to replace the use of diesel to power the community. The Sakkuq Landholding Corporation holds the property rights to Category I lands in Kuujjuaraapik, as well as specific rights and responsibilities over Category II lands. Discussions were held between the Sakkuq Landholding Corporation and Nimschu Iskudo from 2013 to 2018 to determine the feasibility of the hybrid power plant project. The discussions led to the signing of a memorandum of understanding to give concrete expression to the project and set up a steering committee to further develop the project. The steering committee's activities led to the establishment of the KWREC.

Ikayu Energy, which is owned by Ikayu Development Inc. and Tugliq Energy Co., was created in 2019 to help Nunavik communities develop, build and manage their own renewable energy projects. Ikayu Development Inc. is wholly owned by the Nunavik Landholding Corporations Association, created to support economic development in Nunavik communities. Tugliq Energy Co. specializes in renewable energy and micro-grid projects to replace fossil fuels. It has been operating projects in the Canadian Arctic since 2015, including wind projects such as Raglan I and Raglan II. Ikayu Energy's role will be to operate and maintain WKHPPP infrastructure. Groupe TCI will be responsible for building the wind farm, including the turbines, access roads and power transmission lines.

3.2 Project Location

The study area, approximately 46.8 km^2 in size, is located in Nunavik, along the 55th parallel. It encompasses the Cree village of Whapmagoostui and the northern village of Kuujjuaraapik located at the mouth of the Great Whale River, on the north bank, in the James Bay region. Of the total area, 31.6% (14.8 km^2) is located on Category I lands of Kuujjuaraapik and 68.4% (32 km^2) on Category 1A lands of the Whapmagoostui First Nation.

The wind turbines will be installed on the top of a hill in the southeast part of the study area, roughly 5 km from the communities of Whapmagoostui and Kuujjuaraapik, located entirely on Cree Category IA lands. According to section 4.10 of the *Constitution of the Cree Nation of Eeyou Istchee*, the granting by a Cree First Nation of a lease, usufruct, easement, area or other right of use or occupation in respect of its Category IA lands for a term of ten years or more, pursuant to paragraph 12.3(1)(a) of the *Governance Agreement*, for non-residential purposes, has no effect unless approved by the electors of the Cree First Nation at a special meeting or a referendum in

which at least twenty-five per cent of the electors voted on the matter, in the case of a grant of twenty-five years or more. As indicated during the public hearing, the proponent will have to wait for the authorization of the project by the Regional Administrator before starting this process.

3.3 Rationale for the Project

The WKHPPP is in line with the spirit of Chapter 10 of the *La Grande Agreement* (1986), which provides for the provision of reliable electricity services to all Cree communities and the connection of Cree electrical installations to the Hydro-Québec power grid. The Québec government reiterated this commitment when it signed the Agreement Concerning a New Relationship Between le Gouvernement du Québec and the Crees of Québec in 2002. As part of that agreement, Hydro-Québec, the Société d'énergie de la Baie James and the Crees of Québec signed the Whapmagoostui Transmission Line Agreement.

Hydro-Québec's[1] 2020-2029 electricity supply plan for off-grid systems forecasts an increase of approximately 1.5% annually in energy and power needs at the Kuujjuaraapik thermal power plant. Hydro-Québec also anticipates that the current plant will no longer be able to ensure the security of the community's electricity supply, and that the energy needs of the community will exceed the energy provided by the current power plant by 2022-2023. As a result of this increased demand in energy, Hydro-Québec is considering adding a generator to the existing diesel-power plant to increase its capacity from 3.41 MW to 5.3 MW. This separate project is currently under review by the Kativik Environmental Quality Commission.

In 2018, the existing Kuujjuaraapik diesel power plant consumed roughly 3.2 million litres of diesel. In addition to being expensive to operate due to the cost of fuel and supply, diesel plants account for a significant percentage of Québec's GHG emission balance sheet. The impact of climate change is acutely felt in these northern areas. Although the existing thermal power plant will remain in operation, the goal is to produce 40% to 50% of electricity from wind power. The project would therefore reduce diesel consumption by at least 1.45 million litres and its associated GHG emissions in the first year of operation in 2024 or 2025.

Hydro-Québec Distribution evaluated the technical and economic aspects of the project. In the 2020 and 2021 Progress Reports on the Electricity Supply Plan 2020-2029, discussions between Hydro-Québec Distribution and KWREC are ongoing, with the goal to sign onto a power purchase agreement that will be submitted to the Régie de l'énergie for approval in 2022.

In short, according to the proponent, the WKHPPP is part of a common desire to provide clean and renewable energy, while maximizing economic benefits and job creation for local communities and contributing to the reduction of GHG emissions.

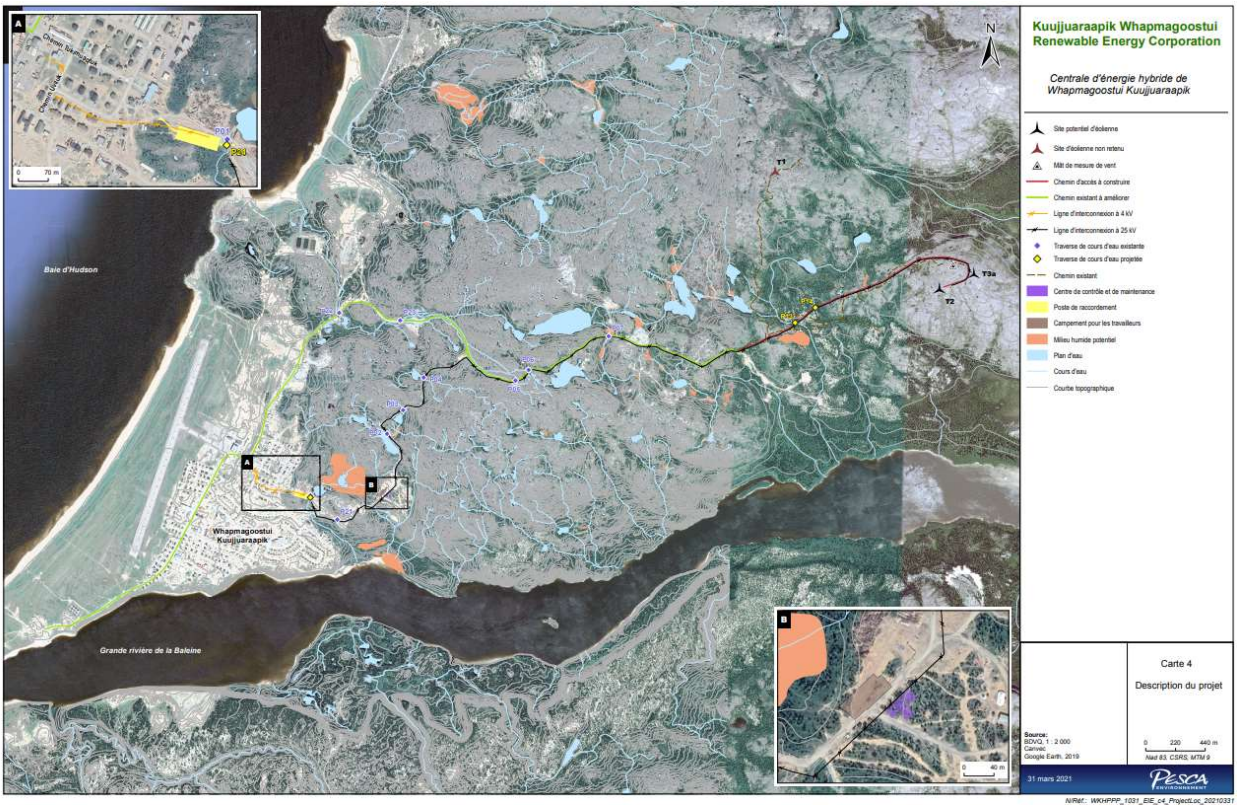
3.4 Alternatives to the Project

Since 2011, the communities of Whapmagoostui and Kuujjuaraapik, in collaboration with Hydro-Québec, have studied various alternatives to diesel. Wind power was chosen because of the available wind potential, the environmental and socioeconomic contexts and because it is an established and appropriate technology to reduce fossil fuel use. The initial project included three potential sites for installation of the wind turbines (T1, T2 and T3), all of them located in the study area (Figure 1. Project Location). However, following meetings and discussions with special-interest groups, one of the sites (T1) was eliminated.

---

[1] http://publicsde.regie-energie.qc.ca/projets/529/DocPrj/R-4110-2019-B-0010-Demande-Piece-2019_11_01.pdf

Figure 1: Project Location



Source: Map 4 – Project Location, taken from Environmental and Social Impact Assessment, Volume 2, Cartographic documents – Whapmagoostui Kuujjuaraapik Hybrid Power Plant Project*, March 31, 2021, p.13.*

3.5 Description of the Project and its Components

The WKHPPP consists in building a wind farm with two wind turbines with a nominal capacity of 1.5 MW each, for a total installed capacity of 3 MW. The wind turbines used will be Goldwind GW87 and are 118.5 m high, requiring a temporary work area of 1 ha each. The installation and positioning of the wind turbines were determined based on wind measurements taken in the Kuujjuaraapik-Whapmagoostui sector during anemometric surveys conducted by Hydro-Québec between 2004 and 2006. The wind turbine site was selected because of its geographical location on the infrequently used peaks of Whapmagoostui and based on set criteria, such as optimal wind potential and reduction of environmental and social impacts. The wind turbines will be installed on a hill in the southeast part of the study area, in the territory of Eeyou Istchee (Cree Category 1A lands), on the outskirts of Whapmagoostui and Kuujjuaraapik.

The wind turbines will be connected to a substation by a 25-kV overhead line 6.8 km long, and from there to the Hydro-Québec generating station by a 4-kV overhead line 0.4 km long. The project also involves the installation of a wind mast, the development of a control and maintenance centre and the development of 9.1 km of access roads, including 2.2 km of new road and 6.8 km of existing roads that may require upgrading. Three new watercourse crossings will have to be built, in addition to the 10 existing watercourse crossings on the current access roads that may require upgrading. The anticipated life of the project is 25 years.

The existing diesel power plant will remain in operation to ensure the stability and control of the communities' electricity supply. The goal is to produce 40% to 50% of the electricity from wind power, based on the current output provided by the existing power plant.

A battery will also be used to store electricity produced by wind turbines and thus compensate for possible fluctuations in electricity production. However, it should be noted that the operation of this battery will be managed by Hydro-Québec and is therefore not directly part of the components of the WKHPPP.

Overall, construction of the project will require approximately 1,200 m^3 of sand and 800 m^3 of concrete for the foundations of the wind turbines. The proponent says that the gravel required for construction of the WKHPPP will come from excavated rocks along the road access and at the wind turbine site. An existing sand pit, located close to the study area (55°17.113'N; 77°41.322'W), is likely to be used. However, the proponent plans to set up a temporary concrete manufacturing site near the work area, along the road section to be built (55°17.418'N; 77°41.777'W).

The proponent will comply with the directives and regulations in force during the post-project dismantling phase. Wind turbines and power lines will be dismantled and transported off site. The concrete bases of the wind turbines will be levelled and the soil will be restored to its natural state. All hazardous materials will be transported to the places provided for that purpose.

3.6 Project Timeline and Cost

The proponent expects construction to begin in 2022. The commissioning of the hybrid power plant is scheduled for December 2024 at the latest. Capital expenditures are estimated at between $40 million and $44 million. The power plant will be owned by KWREC, which will sell the electricity produced to the public utility, Hydro-Québec. According to the proponent, a 25-year power purchase contract will be signed between Hydro-Québec Distribution and KWREC.

4. CONSULTATIONS AND COMMUNICATIONS

The environmental and social impact assessment contains resolutions and letters of support for the development of renewable energy projects from local stakeholders, including the Grand Council of the Crees, Makivik Corporation, the Sakkuq Landholding Corporation of Kuujjuaraapik and the Whapmagoostui First Nation Council and band members. In addition, the proponent organized various consultation activities in the communities of Whapmagoostui and Kuujjuaraapik, including workshops in small target groups (youth, women, men, business sector), general assembly and online sessions. Although attendance of the consultations was low due to the COVID-19 pandemic, 48 members of the Cree community and 50 members of the Inuit community participated. The consultations shed light on the communities' concerns, including the project's impacts on the environment (wildlife) and traditional activities (hunting), its socioeconomic benefits, the noise impact of wind turbines and the advantages and disadvantages of using wind energy technology in a northern coastal climate. A website[2] is also available to inform the public about the various components and aspects of the project.

[2] https://kwrec.ca/

4.1 Public Hearing

The COMEX held a public hearing regarding the WKHPPP on February 23rd, 2022, between 13:00 and 19:00. Due to restrictions put in place in relation to the COVID-19 pandemic, the public hearing was held in a hybrid format that included both a face-to-face presentation in Whapmagoostui and an online format. In addition to the proponent, members of the COMEX, including one physically present in Whapmagoostui, representatives from Hydro-Québec, and the consultant for the proponent, were also present virtually at the public hearing and were joined by analysts from the Cree Nation Government and the Ministère de l'Environnement et de la Lutte contre les changements climatiques (MELCC). A dozen people showed up on site, while about thirty others participated via the various online platforms (Zoom and a LiveStream link accessible via the Cree Nation Government website). In addition, the public hearing was broadcast simultaneously on the local radio station (CQRK-FM). Online participants could post their comments or questions on the COMEX Secretariat Facebook page. The proponent's presentation and exchanges were held mainly in English and Cree and simultaneous English-Cree translation was provided throughout the hearing.

During his greeting, the Mayor of Kuujjuaraapik, Mr. Anthony Ittoshat, highlighted the importance of the project for the communities of Kuujjuaraapik and Whapmagoostui. Despite the absence of Mr. Robbie Kawapit, the Chief of Whapmagoostui, Mr. Ittoshat mentioned that the project has the support of both communities, illustrating their desire to work together for the well-being of citizens in each community. The public hearing also allowed six community members to question the proponent and the COMEX and share their concerns about the project. COMEX members also questioned the proponent and Hydro-Québec about certain aspects of the project. In total, a dozen questions, including sub-questions, were addressed to the proponent during the public hearing.

4.2 Issues Raised during the Public Hearings

The main concerns raised by participants during the public hearing included the rationale for the project, alternatives and possible expansions of the project, the process for developing an agreement for the use of Cree Category 1A lands, local socio-economic benefits, particularly those perceived by young community members, community use, noise pollution and the effects of the project on caribou. In addition, the importance of continuing consultations and information efforts with community members, so that they can inform, educate, and familiarize themselves to this new type of project, was emphasized. This is the first wind farm project located in a northern community in Eeyou Istchee. It is therefore essential that community members are adequately informed about the repercussions, both positive and negative, of the project, to optimize its social acceptability. At the end of the hearing, the Chair of the COMEX stated that the public could submit questions and comments within a period of 30 days following the hearing.

Following the public hearing, the COMEX received two questions. The questions focused on the distribution of dividends generated by the WKHPPP within the communities and the possibility of replacing oil heating systems with electric heating systems powered by wind turbines. It should be noted that no briefs were submitted. The issues raised during the public hearing are incorporated into various elements presented in Section 5 *Analysis of the Project*.

5. ANALYSIS OF THE PROJECT

The aim of the following analysis is to determine the environmental and social acceptability of the WKHPPP. The following sections present the results of the analysis based on the main issues identified from the environmental and social impact assessment and other documents submitted by the proponent, the opinions obtained through intradepartmental and interdepartmental consultations and from experts at the Cree Nation Government, and the opinions expressed by community members and local stakeholders during the public hearing. An examination of the issues led to recommendations.

5.1 Analysis of the Rationale for the Project

Currently, the communities are supplied with electricity by a diesel power plant with an installed capacity of 3.41 MW that is not connected to the Hydro-Québec distribution network. This off-grid system serves 721 clients, including 602 residential clients from the two communities concerned.

As previously mentioned, in addition to lowering the high cost of diesel power as well as its GHG emissions, the WKHPPP delivers on the government's commitment to provide reliable electricity services to all Cree communities and connect Cree electrical installations to the Hydro-Québec grid.

According to the proponent, the WKHPPP will reduce the communities' dependence on fossil fuels by fulfilling about 40% or 50% of their electricity needs. This reduction in diesel consumption would correspond to a reduction of about 4,000 CO^2 eq from the communities' annual balance. The proponent has committed to submitting an annual monitoring report on the diesel consumption of the existing thermal power plant to observe the actual fuel savings and GHG reductions generated by the WKHPPP.

> *It is noted that the WKHPPP delivers on the government's commitment to provide reliable electricity services to all Cree communities and connect Cree electrical installations to the Hydro-Québec grid and to reduce GHG emissions from the exclusive use of fossil fuels to meet the communities' energy requirements.*
>
> *The COMEX is of the opinion that to verify the fuel savings, as well as the reduction in GHG emissions generated by the project, the proponent must submit an annual monitoring report of the diesel consumption of the existing thermal power plant. A follow-up report should be submitted to the Regional Administrator, for information, every five years following the start of operation of the project. (See condition 16 in the Recommendation section of this report)*

5.2 Analysis of alternatives

Over the years, several projects were considered to supplement the energy needs of both communities. One example is the biomass project mentioned during the public hearing, for which a directive was issued but no action or follow-up was taken. According to the proponent, the involvement of the community in every stage of a project, namely its design, construction, and operation, is a determining factor in the success of such a project. This observation has led the proponent of the WKHPPP to establish a partnership with the communities, thus creating KWREC.

The possibility of connecting the communities to Hydro-Québec's main power grid was also discussed in the impact study and during the hearing. In this regard, Hydro-Québec pointed out that this type of connection is always the preferred option, however, this option was not a feasible alternative for the communities of Whapmagoostui and Kuujjuaraapik in the short or medium term.

Hydro-Québec was also asked about other alternative energy sources. Hydro-Québec indicated that although nuclear power plants are technically a feasible solution, this technology is not an avenue that Hydro-Québec wishes to retain or explore. Regarding solar power, although a solar power plant is an easily implementable solution, it would involve the installation of many solar panels, thus reducing the profitability of the project. For the present, Hydro-Québec and the proponent argue that a wind farm is the most suitable technology for this type of community.

5.3 Issues

The following sections examine the main environmental issues related to the construction and operation phases of the WKHPPP that came to the fore in the environmental and social impact assessment and public consultations. They concern the biological, physical, and human environments, in particular impacts related to socioeconomic aspects of the project, noise, transportation and traffic, landscape, traditional activities, archaeology, wetlands, and bodies of water (WBW), forests and woodlands, and wildlife.

5.4 Analysis of the Issues

5.4.1 Socioeconomic Aspects

The Whapmagoostui First Nation and the Inuit community of Kuujjuaraapik live side by side north of the 55th parallel, making Kuujjuaraapik the southernmost northern village (Inuit community) in Nunavik and Whapmagoostui the northernmost Cree community in Eeyou Istchee.

According to the 2016 Census, the northern village of Kuujjuaraapik is home to 686 Inuit, who live in the western portion of the village bordering Hudson Bay. The principal languages spoken are Inuktitut and English, but some also speak Cree and French. In 2016, the Cree community of Whapmagoostui had a population of 984 people who mainly speak English and Cree.

The main sectors of employment in both communities are health care, social assistance, public administration, and educational services.

Although the two communities share a number of services, they each have their own system of governance. The Inuit community of Kuujjuaraapik is organized as a northern village municipality and is served by the Kativik Regional Government, whereas the Whapmagoostui First Nation is incorporated under the Cree-Naskapi of Quebec Act, S.C. 1984 and is administered independently by a local band council and is under the jurisdiction of the Grand Council of the Crees and the Cree Nation Government. Owing to their geographical proximity, the two communities share certain infrastructure and responsibilities related to health, social and educational services as well as the Kuujjuaraapik cooperative. The Kuujjuaraapik airport is located in the study area, ensuring regular air service.

Direct and indirect economic benefits are expected for local communities during all phases of the project. The total investment for the WKHPPP life cycle is estimated at between $40 million and $44 million. The financial plan provides that approximately 60% of the costs will be returned to

the communities of Whapmagoostui and Kuujjuaraapik, representing roughly $24 million in dividends to the communities. Considering the life expectancy of the project, this could represent about $1M per year in dividends, or about $500,000 per year per community. Most of the construction costs, apart from supplies, will be attributed to local contracts, particularly local suppliers of concrete and building materials. Indirect spinoffs are also expected, particularly through accommodation and living expenses of non-resident workers. Although the proponent has determined that the economic benefits during the construction phase will be positive and strong, these benefits have not been assessed or quantified by the proponent at either the local or regional level.

The proponent confirmed during the public hearing that neither community would have to pay any fees during the construction and operation phases of the project. It should be noted that the annual operating costs of the hybrid power plant, estimated by the proponent, are $1 million per year.

A 25-year power purchase agreement must be signed between Hydro-Québec Distribution and KWREC. During the public hearing, the Hydro-Québec representative indicated that a lot of work remains to be done before a signature is reached. However, the proponent assures the COMEX and the public that discussions with Hydro-Québec are ongoing and that the contract will have to be submitted to the Régie de l'énergie du Québec for approval. The proponent indicates that the dividends generated by the project will be redistributed equally (50% / 50%) between the communities of Whapmagoostui and Kuujjuaraapik. These dividends will be paid annually to the communities, based on revenues from the sale of electricity, subtracting the operating costs of the plant, according to the contract to be signed with Hydro-Québec and in accordance with the policies of the Régie de l'énergie du Québec. The proponent plans to produce an annual report that will illustrate the revenues, costs, and profits of the project. Each community will then be able to determine how these dividends will be used. The proponent also notes that Whapmagoostui First Nation will receive an income related to the use of Cree Class 1A lands for the presence of WKHPPP infrastructure.

Employment and training

The proponent says that the project will create jobs for local Cree and Inuit workers. Construction is expected to generate around 30 jobs, whereas operation of the plant will create 3 new jobs. To that end, the proponent will establish a training program for community members to fill some of the jobs and foster local interest in clean energy projects.

The training will be offered by Nergica, a centre for applied research and technology transfer focused on renewable energy located in Gaspé. The training will be given to 10-20 participants in three phases starting in fall 2022. Successful participants will have access to a comprehensive 3-year electromechanics program to become certified wind turbine operator and maintenance technicians. The proponent has budgeted funds to cover the cost of the training program offered by Nergica. KWREC will apply to the Skills Development Program offered to employers by Apatisiiwin Skills Development, a department of the Cree Nation Government. It will also support Cree beneficiaries eligible for the Cree School Board's Post-Secondary Program. A similar process will be undertaken for Inuit beneficiaries under the programs managed by the Sustainable Employment Department of the Kativik Regional Government and the Kativik lisarniliriniq School Board. According to the proponent, this program could not only improve the direct employment of younger community members during the exploitation phase of the WKHPPP project, but it may

also allow younger community members to access a career in this technical field and stimulate their interest in improving their skills. As a result, other opportunities could be available to them.

Consultations and communications

As specified in Section 4 *Consultations and Communications*, the proponent has conducted various public consultations in recent years. Although these consultations targeted every group present within the communities (youth, women, men, and business sector), it appears from the proponent's consultations that the project continues to cause misunderstanding and concern among some members. Specifically, the elders have indicated that they want to know more about the wind energy industry. Being a new technology for the communities, they consider that it would be beneficial for the proponent to continue their information workshops to reassure the population about the advantages, disadvantages and impacts of such a project. In addition, the youth have expressed an interest in obtaining information on the benefits of the project for their community, particularly regarding the improvements that this project will bring for future generations.

In response to these questions, the promoter briefly recalled the socio-economic benefits of the project, including employment opportunities for young people both directly and indirectly. In addition, he reiterated the attractions, both economic and environmental, of using a renewable energy source in reducing the communities' dependence on fossil fuels, local pollution, and the risk of contaminating local sources of drinking water. However, the proponent clarified that the current project is only one step within the many steps needed to eliminate the use of diesel within northern communities targeted by the government. It should be noted that due to technical and public safety restrictions, residential heating systems cannot be substituted by the WKHPPP. This is an element that always seems to cause misunderstanding among members of the communities.

The proponent wants to continue their information activities to improve public understanding of wind technology, particularly to the elders, so that they understand the nature of the project and its benefits for the communities of Whapmagoostui and Kuujjuaraapik.

Monitoring and Consultation Committee

The proponent undertakes to set up a Monitoring and Consultation Committee prior to the construction phase and keep it active during the entire operation phase. The committee will bring together representatives of local communities, the proponent, and the contractor. The committee will be mandated to maximize local economic spinoffs and promote employment of people from local communities during the construction and operation phases. In addition, the COMEX would like regular meetings to be planned to discuss the project’s other the environmental monitoring program and land-use impacts. Currently, no plans have been made regarding the creation of a registry for complaints or a system to address and handle complaints from the public.

> *The COMEX wishes to be informed of the final composition of the Monitoring and Consultation Committee before the start of construction work, the planned complaint management system and the list of follow-ups that the proponent intends to share and discuss within the Monitoring and Consultation Committee. (See condition 1 in the Recommendation section of this report)*

5.4.2 Noise pollution

A characterization of ambient sound levels was performed at three sites in August 2013, in accordance with the measurement criteria for wind projects in Québec and memorandum of instruction 98-01 on noise.[3] The location of the three measurement sites was determined based on the location of the planned infrastructure, the access roads to be used and the position of the potential receptors. The maximum 1-hour noise levels ($L_{Aeq,\ 1\ h}$) ranged between 38.5 and 57.4 dBA during the day (7 a.m. to 7 p.m.) and between 28.6 and 49.6 dBA at night (7 p.m. to 7 a.m.). Initial possible noise sources are wind, various types of vehicles, gunshots, barking and bird calls.

Construction phase

According to the proponent, activities during the construction and dismantling phases will contribute to increased ambient noise levels, mainly due to the transport and use of heavy machinery. The proponent undertakes to plan traffic and work in the territory in such a way as to comply with the requirements of the MELCC guidelines for noise levels from construction sites (*Lignes directrices relativement aux niveaux sonores provenant d'un chantier de construction industrie*, in French only).[4] The maximum allowable noise levels from construction sites are 55 dBA during the day and 45 dBA at night. The proponent undertakes to conduct noise climate monitoring near the inhabited environment during the main construction and transportation activities.

> *The COMEX notes that by agreeing to respect the requirements applicable on a construction site and to carry out an environmental survey and monitor any noise pollution, it is noted that the proponent will satisfactorily handle any noise issue during the construction phase.*

Operation phase

The proponent states that, during operation, the movement of wind turbine blades and operation of turbines produce noise levels that vary according to site conditions (wind, human activities). The noise may be heard by members of the communities of Whapmagoostui and Kuujjuaraapik. The perception of noise levels from the wind turbines will vary depending on weather conditions and the land user's location. The closest inhabited area to the wind turbines corresponds to the camps located along the access road, more than 1.7 km from the wind turbines.

To assess the sound emission from the future wind turbines, a simulation was carried out in accordance with standard ISO-9613-2 *Attenuation of sound during its propagation in the open air – Part 2: General calculation method*. The simulation suggests that the sound level perceived at the closest inhabited area to the wind turbines would be less than 30 dBA. Note that according to memorandum of instruction 98-01, sound levels must not exceed the criteria for Category II sensitive areas, that is, 50 dBA during the day and 45 dBA at night. The proponent further undertakes to monitor noise levels from the wind turbines during the first year of the operation phase of the WKHPPP. During the public hearing, the consultant indicated that, in general, for this type of project, noise monitoring is carried out during the first year of operation. This monitoring is usually abandoned after the first year of operation due to low impacts and no complaints.

---

[3] https://www.environnement.gouv.qc.ca/publications/note-instructions/98-01.htm

[4] https://www.environnement.gouv.qc.ca/publications/note-instructions/98-01/lignes-directrices-construction.pdf

The COMEX notes that in the occupied area closest to the wind farm, the noise levels produced by the wind turbines will be acceptable. However, the project is located near an isolated community where background noise is particularly low. The COMEX wishes to be informed of the noise monitoring program and the results of the noise climate monitoring during the operating phase. The noise monitoring carried out during the first three years of operation will confirm the results from the simulation studies regarding noise emissions from wind turbines performed by the proponent as part of the environmental and social impact assessment. (See condition 3 in the Recommendation section of this report)

The COMEX is of the opinion that the results of the noise monitoring program should be presented to the Monitoring and Consultation Committee. It is also suggested that the proponent include any noise complaints submit via the complaint management system be presented to the Monitoring and Consultation Committee.

5.4.3 Transportation and Traffic

Equipment will be transported by boat directly from Montréal and then by truck. The proponent and general contractor validated that the road network can support the projected loads and sizes. Priority will be given to the use of existing access roads and, depending on existing road conditions, upgrading could range from simple grading to localized widening and correction of curves to improve road allowance. The proponent estimates the number of trips to transport the wind turbine components by truck at around 17 and another 100 trips to transport the concrete. This is in addition to the daily circulation of workers by pickup trucks and vans. During the peak of the construction phase, up to 30 workers will circulate on the site daily.

However, the proponent promises that roads will remain accessible to users and that signage will be installed. Temporary traffic interruptions may be required, for example when replacing a culvert or during blasting. For safety reasons, traffic speed will be reduced and access to work areas may be prohibited to users. The proponent undertakes to transmit the necessary information to the population. The proponent also undertakes to ensure regular road maintenance and, if necessary, road repairs.

Granular material

The proponent says that the granular material required for construction of the WKHPPP will come from excavated rocks along the access roads and at the turbine sites. In addition, approximately 1,200 m^3 of sand will be needed for construction of the project. An existing sand pit located close to the project area (55°17.113'N; 77°41.322'W) will likely be used as well. This sand pit is located more than 1 km from the closest camp and more than 3 km from the village. If this sand pit can not meet the needs of the project, the proponent plans to operate a new borrow or sand pit located near the road to limit the transport of materials. The proponent has agreed to undertake the process to obtain the necessary authorizations to operate this new site.

The COMEX notes that a new borrow or sand pit could be operated by the proponent. The proponent will first have to check whether this new borrow or sand pit could be subjected or exempted from the evaluation and review procedure. If this new site is subjected to the procedure, they must inform the Regional Administrator, and if applicable the Provincial Administrator.

The COMEX is of the opinion that before the start of construction work, the proponent must inform the Regional Administrator regarding the use of any borrow or sand pit by the proponent. The exact location(s) of the borrow or sand pits should be presented, information on the operator(s) must be provided, an update on the authorization of the site(s) and their lifespan should be presented as well as a clarification of the material requirements (quantities and quality) for the project, for each of the sites that will be operated, must be submitted. (See condition 20 in the Recommendation section of this report)

Regarding the regulatory framework: The proponent must also obtain a ministerial authorization under section 22 of the EQA or a declaration of compliance under section 117 of the REAFIE before the start of its operation at the Direction régionale de l'analyse et de l'expertise de l'Abitibi-Témiscamingue et du Nord-du-Québec of the MELCC.

Temporary concrete manufacturing site

The proponent says that the 800 m^3 of concrete required for the project would be prepared at a temporary concrete manufacturing site. The concrete requirements are entirely related to the turbine foundations and the works will only last for a few months. Consequently, the temporary concrete manufacturing site will be located close to the work area to limit transport. The preliminary location is along the road section to be built at geographical coordinates 55°17.418'N, 77°41.777'W. The proponent specifies that the mobile unit will comply with the following regulatory requirements:

- It will be set up at the place indicated for a maximum of 13 months.
- No residual granular material will be stored on site.
- The site will be located more than 30 m from a watercourse, lake or wetland.
- The water from washing operations will be collected and stored in a watertight pond, and the discharge point for wastewater from the pond will not be located in the littoral zone or on the shore of a lake or in a wetland.

COMEX finds the planned operations at the temporary concrete manufacturing site to be acceptable.

5.4.4 Landscape

The wind turbines will be installed approximately 5 km from the communities of Whapmagoostui and Kuujjuaraapik. The nearest turbines will be located 5.1 km from the beach on the shore of Hudson Bay, over 5.3 km from the Kuujjuaraapik airport and 7.3 km from the mouth of the Great Whale River, all important viewpoints in the project area. The visual simulations supplied by the proponent primarily show the visual impact of the WKHPPP in relation to the wind turbines during the operation phase. Due to the absence of forest cover, the wind turbines will be more visible and harder to integrate into the natural landscape, composed mostly of open spaces offering wide visual fields.

The predominantly white turbines will blend more easily into the winter landscapes. In summer, however, based on the visual simulations submitted by the proponent, the wind turbines will be visible in the foreground and middleground in the zone of strong influence, which is where the access roads to the wind turbines are located. A minor impact is expected for views to the

background landscape from the beach bordering Hudson Bay, the mouth of the Great Whale River and the airport. The proponent therefore deems that the visual impact of the wind turbines will vary from minor to medium depending on proximity to the viewpoint. Note that the proponent does not expect the nacelles of the wind turbines to be visible from the communities of Whapmagoostui and Kuujjuaraapik.

To mitigate the impacts on the landscape, the proponent opted for a more powerful wind turbine model in order to reduce the number of turbines installed and optimize harmonious integration into the landscape by using turbines of the same visual appearance and operation.

Apart from the wind turbines, the new overhead power lines and access roads are not likely to cause additional visual impacts given that the landscape is already anthropized.

5.4.5 Land Use

During the consultations with the two communities, the proponent was informed that the study area is used for various recreational, spiritual, and cultural activities. Both the Cree and Inuit frequently hunt, fish and trap in the area. The main target species for hunting are Canada goose, woodland caribou, ptarmigan, snow goose, moose, and black bear. Moreover, interviews with the local population confirmed that waterfowl (goose) hunting areas are located northwest and southeast of the hill where the wind turbines would be installed. In addition, a ptarmigan hunting area is located north of the existing road, near water bodies. While use of the study area for fishing and trapping activities is limited, several participants in the consultations said that they occasionally fish in the study area in fall and winter and that fox and hare are trapped in the area.

The local population traditionally uses the study area for gathering berries, medicinal plants, wood and boughs. More specifically, people often go there in late August and September to pick crowberries, blueberries, cloudberries, Labrador tea and lyme grass. Areas used for gathering are also used as picnic areas by the communities.

Various camps are spread throughout the study area, outside the communities. Participants in the consultation process confirmed that the study area was frequented by users of these camps, especially the trails leading to the camps. Moreover, there are several ATV and snowmobile trails located near the study area that are used to get to the camps and travel within the territory.

Participants in the consultation process also indicated that gatherings are traditionally held for Sundance ceremonies in the south of the study area. A Sundance is held once a year, in the first week of July. Several participants also mentioned that they frequent the study area to enjoy the scenery.

According to the proponent, the construction phase could have an impact on the activities carried out on the territory of the communities due to the disturbance caused by the movement of heavy machinery, equipment, and workers. Note that in addition to the commitments related to transport and traffic mentioned in section 5.3.3, the proponent undertakes to maintain continuous communication during the planning and performance of work to maintain harmonious cohabitation in the territory.

The operation phase may also generate impacts on certain traditional activities, including hunting and trapping. Although wildlife is expected to gradually return to the study area, the avoidance behaviour of more sensitive species, such as caribou, could continue during the operation phase of the WKHPPP. This behaviour could therefore reduce the hunting success rate for these species.

The proponent undertakes to follow up with hunters in fall to identify and assess impacts. While special attention will be given to goose hunting in the areas northwest and southeast of the hill where the wind turbines are planned, the follow-up program will cover all hunting activities, including caribou hunting. In the event of a significant impact, the proponent undertakes to put in place mitigation or compensation measures in collaboration with the hunters. The proponent has not submitted a follow-up program on land use, however, they clarified during the public hearing that the *Hunters and Trappers Association* and the *Whapmagoostui Hunters and Trappers Association* will participate in this follow-up. See section 6 (*Environmental Monitoring and Follow-up*) for further details.

> *Consequently, the proponent's failure to address the potential impacts of the wind turbines on caribou behaviour is a significant omission in the impact assessment. Considering the importance of hunting as a traditional pursuit, the possibility that the project may disturb and cause caribou to avoid the project area, thereby reducing the hunting potential, must be assessed. COMEX also recommends that the follow-up with hunters be included in the monitoring program for land use. As part of the monitoring program, the proponent must submit a follow-up report to the Regional Administrator, for information purposes, annually during the first three (3) years of operation of the wind turbines and then every five (5) years until the end of the wind farm's operation. The land user's follow-up and monitoring report must include details regarding the project's impacts on trapping, hunting (ptarmigan, porcupine, wildfowl, bear, caribou), gathering of berries and medicinal plants, cultural gatherings, and activities near the project area. The report must also include any issues and monitoring regarding the safety of the site. The proponent must also assess the proposed mitigation measures and indicate whether changes or enhancements are foreseen. (See Condition 5 in the* Recommendation *section of this report)*

5.4.6 Archaeological and Cultural Heritage

The proponent based its description of the study area's archaeological heritage on past archaeological research, in particular, research carried out from the 1960s to 1980s in the context of Hydro-Québec's Grande-Baleine hydroelectric project, which partially overlaps the WKHPPP study area. These studies indicate that human occupation in the study area dates back around 3,700 years. First Nation and Inuit prehistoric, historic and contemporary sites have been identified in the study area. According to the proponent, the archaeological potential is higher along the coast of Hudson Bay and the shores of the Great Whale River than inland due to the presence of natural travel routes and hunting and fishing grounds, as well as the establishment of trading posts starting in the late 18th century.

In addition, a diamond-shaped tip found in the study area (site GhGk-63) is listed in the Québec cultural heritage directory (*Répertoire du patrimoine culturel du Québec*) and is considered cultural and archaeological property. Reference to the diamond-shaped point found at site GhGk-63 indicates the presence of an archaeological site and such sites generally contain more than one artefact. Archaeological sites also appear to exist near both the access road and future

interconnection line as well as near the borrow pit likely to be used, located near the study area (55°17.113'N; 77°41.322'W). COMEX encourages the proponent to contact the Aanischaaukamikw Cree Cultural Institute and the Avataq Cultural Institute to inquire about these sites prior to any construction work.

According to the archaeologist from the Aanischaaukamikw Cree Cultural Institute, basic information is lacking in the studies used by the proponent to describe the study area's archaeological heritage. Furthermore, the studies present a macro view of the territory, whereas the project will be confined to a limited area.

Even though it is unlikely that activities during the construction phase will have an impact on elements of the archaeological and cultural heritage, the proponent undertakes to inform site managers of the obligation to report to the foreman any chance discovery of an archaeological property or site. In the event of such a discovery, work will be interrupted on the site and the proponent will immediately notify both the Ministère de la Culture et des Communications and the Aanischaaukamikw Cree Cultural Institute and the Avataq Cultural Institut.

> *The COMEX notes that the studies on the archaeological and cultural heritage submitted by the proponent are incomplete. The COMEX recommends that the proponent inquire about the presence of all nearby archaeological sites with the Cree Aanischaaukamikw Cultural Institute and the Avataq Cultural Institute before the start of work. In addition, work performed in areas identified as having a high archaeological potential must be overseen by an archaeologist or a person qualified to recognize archaeological material other than complete objects (flakes, charred bones, hearths, wrought nails, glass beads, etc.). (See Condition 22 in the* Recommendation *section of this report)*

5.4.7 Wetlands and Waterbodies

Wetlands

According to the field inventories conducted by the proponent and the databases consulted, wetlands cover approximately 57.4 ha, or 1.2%, of the study area. Most of the wetlands identified are riparian marshes and ponds isolated from the hydrographic network and fed by precipitation, created by natural depressions in the granite substrate.

The proponent says that during the construction phase, tree clearing, construction and improvement of roads and work areas, as well as installation of equipment, could result in the permanent or temporary loss of an estimated 0.03 ha of potential wetlands, mainly located in the preliminary corridor for the construction of the 25-kV interconnection line.

Although no characterization study of the wetlands affected by the project has been conducted to date, the proponent undertakes, in accordance with section 46.0.3 of the EQA, to submit a characterization study with the application for authorization under section 22 of the EQA. The study will indicate the boundaries of all wetlands located in areas where work will be carried out. The characterization study will include, but not be limited to, a description of the ecological characteristics and functions of the wetlands. The proponent also undertakes to apply an avoid-minimize-compensate sequence to mitigate wetland losses. Where technical or environmental constraints make it impossible to avoid a wetland, the proponent will propose additional mitigation measures to minimize the impacts. Lastly, the proponent undertakes to compensate for all

unavoidable wetland losses, in which case a compensation plan will be developed at the end of the construction phase, in collaboration with representatives of Kuujjuaraapik and Whapmagoostui.

Waterbodies

The study area drains 67.9% of its surface area to Hudson Bay, while 32.1% of its surface water flows to the Great Whale River. It has a complex hydrographic network. Surface water sometimes flows in a diffuse manner through a succession of water bodies with a total surface area of approximately 120 ha. The largest lake in the study area is 8.16 ha in size.

According to the proponent, road construction and improvement and the installation of culverts could alter the surface water flow and result in an influx of sediment to waterways. The proponent states that, in order to minimize potential impacts during the construction phase, roads have been planned to maximize the use of existing roads and reduce the number of new watercourse crossings. Ten (10) watercourse crossings on existing roads will be used for the WKHPPP and three (3) new crossings will have to be installed on the new roads to be built.

The proponent undertakes to assess existing watercourse crossings to determine if they need to be upgraded. Watercourse crossings will be installed in accordance with the main standards of the *Règlement sur l'aménagement durable des fôrets du domaine de l'État* (RADF) and the DFO guidelines on best practices for the design and installation of permanent culverts less than 25 metres (Fisheries and Oceans Canada, 2007).[5] Standard mitigation measures will also be implemented to protect watercourses and water bodies.

> *The proponent must conduct a comprehensive ecological characterization study of the wetlands and waterbodies (WWB) affected by the project. COMEX wishes to receive, for information purposes, a copy of the ecological characterization report, which must include a complete characterization of the wetlands affected, a description of the ecological characteristics and functions of the wetlands, as well as a demonstration that the avoid-minimize-compensate mitigation sequence will be applied for all residual WWB losses. Such demonstration could be included in the plan setting out the measures to avoid and mitigate the project's impacts on wetlands and waterbodies.*
>
> *In the event of WWB losses, the proponent must submit, for approval, a compensation plan for wetlands and waterbodies lost because of the project. The compensation plan must be submitted before the end of the construction phase and be implemented no more than 2 years after the commissioning of the wind turbines. The compensation plan must compensate for the surface area and ecological functions of WWBs lost as a result of the project. In the context of northern wetlands, compensation could take the form of a knowledge acquisition project to, for example, enhance knowledge about the ecological value and biodiversity of wetlands. Additional recommendations will be made in the* Fish *section of this report addressing the impacts on fish habitat. (See Condition 11 in the* Recommendation *section of this report)*
>
> *COMEX is also in favour of the measure to delimit WWBs on site during construction work.*

[5] https://agrcq.ca/wp-content/uploads/2012/02/Guide-MPO-Bonnes-pratiques-pour-la-conception-et-linstallation-de-ponceaux-permanents-de-moins-de-25-m%C3%A8tres.pdf

5.4.8 Forest Stands

According to the characterization study carried out by the proponent, the vegetation and species identified in the study area are common to the spruce-lichen bioclimatic domain in the taiga subzone of the boreal vegetation zone. The total vegetation surface area represents approximately 88.4% of the study area. Vegetation types include subarctic heath (42.2%), coniferous forest with deciduous shrubs (12.4%), coniferous forest with lichens (9.9%), coniferous forest with lichens and mosses (9.7%), tundra (6.8%) and coniferous moss forest (5.4%).

Inventories were conducted in 2012 and 2013 and 48 plant species were identified in the study area. No special-status plant species were identified. However, the database of the *Centre de données sur le patrimoine naturel du Québec* (CDPNQ) contains historical observations of two plant species likely to be designated as threatened or vulnerable, namely Rocky Mountain willowherb and upswept moonwort, along the Great Whale River and Hudson Bay near the study area.

According to the proponent, clearing will be required to build the 25-kV line along the access road with a 20-m right-of-way. The clearing could cause alterations in the local ecosystem and available habitat.

Note that the use of existing roads and installation of the wind turbines on rocky outcrops bare of tree vegetation and with sparse shrub and herbaceous vegetation will limit the impacts on forest stands.

> *It is noted that the planned optimization efforts, including the use of existing roads and installation of the wind turbines on a site bare of tree vegetation, will limit the impacts of clearing on forest stands in the project area. However, additional recommendations will be made in the* Avian Fauna *section of this report.*

5.4.9 Wildlife

5.4.9.1 Mammals

Terrestrial mammals

Five large wildlife species are potentially present in the study area: muskox, woodland caribou (forest-dwelling and migratory ecotypes), moose, black bear and polar bear. Although muskox, which was introduced into Québec near Kuujjuaq in 1967, could potentially be present in the study area, information obtained from participants in the consultation activities held by the proponent suggests that the species is rare.

The two ecotypes of woodland caribou are likely to be found in the study area. The forest-dwelling ecotype, which lives in the spruce-lichen and spruce-moss bioclimatic domains, would be at the northern limit of its range, as very few woodland caribou are seen north of the 54th parallel. In 2020, the woodland caribou population in the James Bay and the Rupert and La Grande river sectors was estimated at around 798 animals, for a density of 0.55 caribou/100 km^2. The woodland caribou is designated “vulnerable” in Québec and the boreal population of woodland caribou is designated “threatened” in Canada. As for the migratory ecotype, various herds numbering thousands of caribou travel hundreds of kilometres depending on the season. According to participants in the public consultation activities held by the proponent, migratory caribou regularly frequent the study area from late fall to early spring. More specifically, the Rivière aux Feuilles

herd begins its fall migration in late September, moving through black spruce-lichen forest near the Great Whale River to its wintering grounds. A population update released by the MFFP in 2018 put the size of the Rivière aux Feuilles herd at an estimated 187,000 caribou, a marked decline from the population estimate of 430,000 caribou in 2011 based on an aerial survey.

The presence of moose, black bear and polar bear is also confirmed in the study area. Note that the southern Hudson Bay polar bear population is likely to frequent the study area during the ice-free months. The polar bear is listed as a vulnerable species in Québec and a species of special concern in Canada.

In addition to large fauna, 18 species of small and medium-sized mammals are potentially present in the study area, which overlaps fur-bearing animal management unit (UGAF) 95. They include two special status species, the least weasel, a species likely to be designated as threatened or vulnerable in Québec, and the wolverine, which is listed as a threatened species in Québec and a species of special concern in Canada. A number of these species are of special interest because they are hunted or trapped by members of the two communities concerned.

Lastly, the proponent was able to determine the potential presence of 11 micromammals in the study area based on their habitat and range. The presence of the deer mouse and Gapper's red-backed vole was confirmed in the study area.

According to the proponent, during the construction phase, particularly the construction and improvement of roads and work areas, the presence of workers and machinery as well as the noise from those activities, may disturb mammals, cause stress and temporarily disrupt their use of the territory. These disturbances could cause short-term behavioural responses, such as avoidance of areas usually frequented or likely to be frequented but are not expected to affect population sizes. In the case of the Rivière aux Feuilles migratory caribou herd, telemetry data from MFFP surveys conducted in 2020 indicate that the study area is part of the herd's wintering area but is not a particularly important range for the species. During the operation phase, the noise and movement of wind turbine blades may disturb certain terrestrial mammals. However, noise impact studies have shown that some species can become accustomed to different sources of noise, especially regular low-frequency noise sources, which means that mammals could continue to frequent the study area during the operation phase. It should be noted that during the public hearing, the proponent argued that it was unlikely that the presence of wind turbines would have an impact on caribou. Based on observations from other northern wind projects (Raglan I and Raglan II), the avoidance behaviour anticipated by caribou was not observed. However, these observations could not be corroborated based on the available results.

> *The potential impacts on the species of terrestrial mammals found in the study area will be limited to disturbance and avoidance. However, it is important to note that the WKHPPP could reduce potential caribou numbers in the study area without affecting the population.*

Bats

Based on the distribution of the eight species of bats found in Québec and on data from earlier inventories, none of these species are likely to be found in the study area because it is located north of their distribution ranges. However, the proponent mentions that one elder who participated in the consultation process once saw a bat during the summer.

In August 2013, the proponent conducted an acoustic inventory that complied in part with the protocol for acoustic bat inventories in the context of wind turbine projects in Québec (MRNF, 2008).[6] The 2013 inventory covered only the migration period, whereas the provincial protocol stipulates that inventories must also cover the breeding period. In 273.5 hours of recording, no vocalizations or full bat calls were detected. Therefore, the inventory did not confirm the presence of bats in the study area.

Given that the presence of bats could not be confirmed in the study area, the proponent deemed that the WKHPPP would have no impact on bat species.

However, in addition to the acoustic inventories' not complying with the provincial protocol, the results of the 2013 inventories may no longer be valid. An increasing amount of data suggests that the flight range of several bat species may extend farther north than the species' current theoretical distribution. Consequently, the proponent was asked to conduct a new inventory complying with all of the requirements of the protocol for acoustic bat inventories in the context of wind turbine projects in Québec, including an inventory covering the breeding and migration periods. In addition, the proponent was informed that data collected during bat inventories are considered valid for one (1) year.

The proponent undertook to conduct a bat survey in 2022, before construction begins, in compliance with the provincial protocol but adjusted to reflect the size of the project and the northern context. Based on the results, the proponent will consult the competent authorities to determine whether additional mitigation measures are required.

> *Considering the proponent's commitment to conduct a bat survey in compliance with the provincial protocol, before construction begins, this issue is deemed to have been addressed in a satisfactory manner. Should mitigation measures be required based on the survey results, COMEX wishes to be informed of the planned measures. (See Condition 7 in the* Recommendation *section of this report)*

5.4.9.2 Avian fauna

Inventories conducted by the proponent in 2012 and 2013 recorded a total of 64 bird species. The most abundant terrestrial bird species recorded were the horned lark, the white-throated sparrow, the common redpoll and the white-crowned sparrow. Waterfowl were generally scarce in the study area during the nesting period. The Canada goose was the most abundant species, mainly during fall and spring migrations. According to participants in the public consultation process, in fall Canada geese occasionally fly over the hill where the wind turbines are planned and use the wetlands on its outskirts. Breeding evidence was also reported for the northern shoveler, greater scaup and green-winged teal. Although no raptor migration corridor was identified by the

[6] https://mffp.gouv.qc.ca/documents/faune/protocole-chauves-souris.pdf

proponent, there were sightings of a few birds of prey, the rough-legged hawk being the most common.

The presence of golden eagle, a species listed as vulnerable in Québec, and the peregrine falcon, a species listed as vulnerable in Québec and a species of concern in Canada, was confirmed in the study area during the migration period. The rusty blackbird, a migratory breeder associated with wetlands that is likely to be designated as threatened or vulnerable in Québec, was also spotted in the study area. The short-eared owl, another species likely to be designated as threatened or vulnerable in Québec and a species of special concern in Canada, lives in open habitats such as marshes, peat bogs, wet meadows and tundra, the types of habitats potentially found in the study area. In Québec, most short-eared owls nest in Nunavik.

Finally, an Important Bird Area (IBA) encompassing the Great Whale River and its tributaries partly overlaps the study area. The 1,989-km^2 IBA stretches from Lac Bienville to the mouth of the river in Hudson Bay and includes nesting sites for the harlequin duck, a species designed as vulnerable in Québec and of special concern in Canada. However, it is not likely to frequent the study area.

The proponent says construction and improvement work on roads and work areas may disturb birds, mainly nesting birds, due to the noise from workers and machinery as well as construction activities. Although the effects of noise differ depending on the bird species, noise can cause stress, avoidance and displacement, as well as influence nesting or birds' communication, hunting or flight behaviour.

COMEX pointed out to the proponent that deforestation for construction of the project could also result in the loss of nesting habitat for several bird species, including the rusty blackbird. It was recommended that the proponent plan additional mitigation measures, at the very least that deforestation be carried out outside the bird nesting period, which roughly extends from May 15 to August 15. The proponent undertook to conduct vegetation clearing outside the nesting period of bird species when possible. However, if clearing during the nesting period cannot be avoided, mitigation measures will be implemented to reduce the impact on nesting birds, including a survey conducted, by a skilled and experienced observer, before clearing begins to confirm that no nests are present.

> *The proponent's commitments in respect of avian fauna are satisfactory. As mentioned by the proponent, if clearing must be carried out during the general nesting period in Québec, a survey of the area to be cleared will be conducted, by a skilled and experienced observer, before clearing begins to confirm that no nests are present. In addition, should the survey results indicate the need for mitigation measures, the proposed measures must be submitted to COMEX, for information purposes, before the project begins. (See Condition 9 in the* Recommendation *section of this report)*

The main impact during the operation phase is collision with turbine blades. Follow-ups conducted for wind farms in operation in Québec reveal low bird mortality rates, with annual mortalities ranging between 0 and 9.96 birds/wind turbine, for an average of 1.6 birds/wind turbine. The highest annual mortality rates are seen in Canada and the United States, at 8.2 birds/wind turbine and 5.2 birds/wind turbine, respectively. The presence of a migration corridor and weather conditions, among other factors, can influence mortality rates. Wind turbines thus remain a minor

source of bird mortality compared to other anthropogenic sources of mortality, such as predation by cats and collision with windows, vehicles, and power lines. Collisions with wind turbines account for less than 0.01% of bird mortalities in Canada.

The birds at greatest risk of colliding with wind turbines are nocturnal migrants. Collision risk is lower for birds of prey and waterfowl because these species avoid approaching wind turbines or flying at blade height. According to the 2012 and 2013 bird surveys conducted in the study area, passage rates for migrating raptors were low and no significant migration corridors or staging areas were detected. However, COMEX pointed out to the proponent that raptor migration data in the context of bird inventories for wind projects are valid for five (5) years. Due to the presence of two species considered vulnerable in Québec, namely the peregrine falcon and the golden eagle, it is strongly recommended that the proponent update the raptor migration survey for this project, before construction begins, to determine whether additional mitigation measures are required. The proponent undertook to conduct a new raptor migration survey in 2022, before construction begins. Based on the results, the proponent will consult the competent authorities to determine whether additional mitigation measures are required.

In addition, unlike most bird species, ptarmigans, an important species for the Cree, are more likely to collide with the base of the wind turbine than with the blades. To mitigate the project's impact on this species, COMEX recommended that the proponent consult the literature on mitigation measures, such as painting the tower bases a contrasting colour. Acting on the committee's recommendation, the proponent undertook to involve the communities in choosing the colour for tower bases.

> *The proponent's commitment to conduct a raptor migration survey in 2022, before construction begins, is deemed satisfactory. However, should the survey results indicate the need for mitigation measures, it is recommended that the proponent submit the planned measures, for information purposes, before construction begins. (See Condition 6 in the* Recommendation *section of this report)*
>
> *Furthermore, considering the commitment to conduct new bat and raptor surveys, COMEX understands that the initial timeline, according to which construction would begin in 2021, has been modified. Construction cannot begin until after these surveys have been conducted, that is, summer or fall 2022.*

5.4.9.3 Fish

Based on data on the distribution of freshwater species, the proponent determined the potential presence of 17 fish species in the lakes and rivers of the study area. They include salmonids, such as lake whitefish, round whitefish, brook trout, Arctic char and lake trout, as well as other species, such as walleye, lake cisco, threespine stickleback, ninespine stickleback and burbot. Moreover, a 2012 field survey conducted by the proponent confirmed the presence of brook trout in the study area.

COMEX stressed to the proponent that the environmental impact assessment included no fish inventories conducted specifically in streams and waterbodies impacted by the project. Such inventories make it possible to target waters in which the brook trout may be found. The proponent was therefore asked to carry out characterization studies of fish habitat, before construction begins, of lakes and watercourses affected by the construction or upgrading of access roads, as well as the

sites where interconnection lines cross watercourses or other bodies of water. COMEX further stressed to the proponent that the results of the characterization studies will help determine the need for mitigation measures. In addition to undertaking to submit a characterization study of fish habitat at the sites of the three watercourse crossings to be built, the proponent undertook to submit a characterization study with the application for authorization under section 22 of the EQA. In accordance with section 46.0.3 of the EQA, the characterization will include the boundaries and a description of the ecological characteristics and functions of all bodies of water (including lakes and watercourses) likely to be affected by the project, in particular, construction or upgrading of access roads, as well as the installation of poles and anchors of an interconnection line in the shoreline.

According to the proponent, construction and improvement of roads and works areas, particularly the installation of watercourse crossings, could result in sediment input in watercourses and fish habitat during the construction phase. Note that the WKHPPP will involve the use of 10 watercourse crossings on existing roads and the installation of 3 new watercourse crossings. To reduce the potential impacts, the proponent says that the construction of roads and watercourse crossings will be carried out in compliance with the requirements applicable to Category I lands, in particular the standards prescribed in the *Regulation respecting the sustainable development of forests in the domain of the State*, in order to protect fish and fish habitat, as well as the guidelines for ensuring free passage of fish and maintaining fish habitat set out in the DFO guidelines on best practices for the design and installation of permanent culverts less than 25 metres.

> *The proponent's commitment to submit characterization studies of the bodies of water (lakes and watercourses) affected by construction of the project is acceptable. COMEX wishes to be informed of the results of the studies.*
>
> *If the characterization studies show that the project will result in the loss of fish habitat, the proponent must submit, for authorization, a compensation plan before construction ends. The plan must be implemented no later than two (2) years after the commissioning of the wind farm. (See Condition 12 in the* Recommendation *section of this report)*

5.4.9.4 Amphibians and reptiles

The study area includes diverse terrestrial and aquatic habitats favourable to amphibians and reptiles. Six species of amphibians and one species of reptiles are potentially present in the study area, including American toad, wood frog, mink frog, northern leopard frog, northern spring peeper, blue-spotted salamander, and the common garter snake. An inventory conducted in 2013 confirmed the presence of two species of amphibians, namely the wood frog and the American toad. No special status species were detected during the inventory.

According to the proponent, construction and improvement of roads and work areas could alter the habitats of amphibians and reptiles, which mainly live near bodies of water and wetlands. Culvert installation and road construction will be carried out in accordance with the principal standards of the *Regulation respecting the sustainable development of forests in the domain of the State*. The impact on their potential habitats will therefore by minor.

6. EMERGENCY MEASURES PLAN

The proponent undertakes to develop and apply an emergency measures plan to protect staff, land users, the public and the environment. The emergency measures plan will describe the various types of accidents and failures that could occur, the preventive measures, the emergency response procedures, the communication, and notification processes, as well as the various types of training that will be offered to those concerned in the construction, operation and decommissioning phases of the WKHPPP. The proponent plans to submit the emergency plan to the departmental authorities during regulatory applications.

> *The COMEX notes that an emergency plan will be developed during the regulatory phase. The COMEX wishes to receive a copy of the emergency plan before construction begins.*

7. ENVIRONMENTAL MONITORING AND FOLLOW-UP

The proponent will implement an environmental monitoring program during construction, operation and dismantling of the WKHPPP. The program will set forth the proponent's undertakings and the specific environmental protection measures.

> *The COMEX considers that the proponent must, however, submit to the Regional Administrator, no later than one (1) year after the beginning of the operation period, a plan for the dismantling of the wind farm and all these components, including access roads. The plan must include the securing of the premises, the restoration of the premises and the methods of disposal of the equipment and materials used. The dismantling plan must be developed with the Monitoring and Consultation Committee and updated every five (5) years, and two years before the end of the project. In the event of the premature termination of the project, the promoter will submit the requested information to the Regional Administrator as soon as possible. (See condition 24 in the* Recommendation *section of this report)*

The proponent will also establish environmental follow-up programs for three components: the noise climate during operation, bird and bat mortalities, and hunting activities and land users.

The purpose of the noise monitoring program is to monitor the noise levels of wind turbines during the operation phase. Noise levels will be monitored from various sites, including near campsites, the Cree village of Whapmagoostui and the northern village of Kuujjuaraapik. The results will be compared to the initial ambient noise levels previously presented and the criteria of MELCC memorandum of instruction 98-01. This monitoring program must be carried out during the first year of operation of the project and the proponent must set up a system for receiving and handling noise complaints. This system must include:

> - the management and study of all complaints, regardless of compliance with the criteria of Instruction Note 98-01 to establish the existing relationships between the nuisances felt, the operating conditions, the atmospheric conditions and any other factor that may be called into question.

- In the event of a complaint, the following information must be collected:
    - o Identification of the plaintiff(s);
    - o Location and time when the nuisance was felt;
    - o Description of the perceived nuisance or noise and its origin;
    - o Weather conditions and activities observed during the occurrence;.
    - o Action taken to respond to the plaintiff.

The purpose of the monitoring program for bird and bat mortalities is to measure the real impact of the WKHPPP on avian fauna during operation, in particular the mortality rates due to the wind turbines. Monitoring will be carried out during the first three (3) years of operation and then every ten (10) years until the end of the wind farm's operation, by searching for carcasses in accordance with the methods stipulated in the reference protocols of the departments concerned, including the Québec monitoring protocol for bird and bat mortalities associated with wind turbines (MDDEFP, 2013).[7] In addition, the proponent undertakes to include bats in the post-construction mortality monitoring, regardless of the results of the new survey to be conducted in 2022.

Lastly, follow-up will be carried out with hunters to assess and detect impacts on this traditional activity. The proponent undertakes to pay particular attention to goose hunting near the hill where the wind turbines are planned and to include the potential impacts on caribou hunting. In the event of a significant impact, the proponent undertakes to put in place mitigation or compensation measures in collaboration with the hunters from both communities. As indicated in section 5.4.5 *Land use*, the follow-up program with hunterst will be included in the land use monitoring program which will also include monitoring of the effects of the project on berry picking and medicinal plant harvesting, on cultural gatherings and activities in the vicinity of the project, as well as a follow-up on any security issues observed on the site.

> *COMEX takes note that the proposed monitoring/follow-up programs are satisfactory. It is recommended that the proponent submit, for approval, the monitoring program for bird and bat mortality. It is also recommended that a bird and bat mortality monitoring report be submitted at the end of each year of monitoring. These reports must include the additional mitigation measures to be implemented where necessary. (See Condition 8 in the* Recommendation *section of this report)*
>
> *The COMEX notes that the proponent intends to set up a noise monitoring program, but that this program has not yet been created. The COMEX recommends that this program for monitoring the noise climate during the operating period be submitted, for authorization, before the construction period. It must also provide for a system for receiving and managing complaints. Each complaint received must be dealt with and included in an annual report demonstrating the actions taken by the proponent shall be submitted for information. (See Condition 4 in the* Recommendation *section of this report)*

[7] https://mffp.gouv.qc.ca/nos-publications/protocole-suivi-mortalites-oiseaux/

RECOMMENDATION AND CONDITIONS

In accordance with Section 22 of the James Bay and Northern Québec Agreement and Title II of the *Environment Quality Act*, after examining the documents submitted by the proponent and factoring into account the public consultations carried out:

The Review Committee hereby recommends authorization of the Whapmagoostui Kuujjuaraapik Hybrid Power Plant Project in Eeyou Istchee territory by Kuujjuaraapik Whapmagoostui Renewable Energy Corporation

This recommendation deals in regards with the project as described in the environmental and social impact assessment and related documents. Any change or addition to the project as authorized must be submitted to the Review Committee for consideration and recommendation.

The present recommendation is conditional upon compliance with the conditions stipulated herein.

Condition 1

Before the start of construction work, the proponent must set up a Monitoring and Consultation Committee. The composition of this committee and its mandate, including the list of follow-ups/monitoring programs to be discussed with the Monitoring and Consultation Committee, must be submitted, for information, to the Regional Administrator. This Monitoring and Consultation Committee must remain active during the construction, operation, and dismantling phases of the hybrid power plant project.

This committee must be composed of members representing the proponent, the Whapmagoostui First Nation community, the Kuujjuaraapik community, the Cree Nation Government, tallymen, the Hunters and Trappers Association and land users. Representatives from Hydro-Québec may also be invited to participate if necessary.

In addition to ensuring the economic benefits of the project, the role of this committee will include reviewing comments and complaints from the public, participating in the revision of the emergency plan and discussion information gathered from inventory, monitoring, follow-up and land use reports. The committee must also produce a communication plan so that citizens can be informed of the project at each phase, and share their comments and concerns, if any.

Condition 2

For all monitoring and follow-up reports, traditional knowledge keepers must be consulted in the development and implementation of the follow-up and monitoring programs. Moreover, the proponent shall include land users and traditional knowledge keepers from each of the communities affected by the project in its field teams in charge of the monitoring programs.

Condition 3
Before construction begins, the proponent must submit a noise climate monitoring program with the Regional Administrator for authorization. A noise climate monitoring report must be submitted to the Regional Administrator yearly for the first three (3) years following the start of operations, and every ten (10) years during the entire operation phase of the wind farm. Based on the results obtained, these follow-up reports shall indicate whether more frequent monitoring is required to collect additional data and include additional mitigation measures to be implemented, if any. The results of this noise climate monitoring report must be shared with the Monitoring and Consultation Committee.

Condition 4
Before construction begins, the proponent must submit to the Regional Administrator, for information, the proposed complaint management system. Thereafter, the proponent must submit to the Regional Administrator, for information purposes, an annual follow-up report on complaints received and handled until the end of operation phase, including all mitigation measures taken by the proponent. The results of this follow-up report must be shared with the Monitoring and Consultation Committee.

Condition 5
Before construction begins, a follow-up program on the impact on land-use must be submitted, for information, to the Regional Administrator. Thereafter, the proponent must submit a follow-up report to the Regional Administrator, for information, yearly for the first three (3) years following the operation of the wind turbines and then every five (5) years until the end of the operation phase. The follow-up report on land use must include the following:

- Monitoring the project's impacts on trapping, hunting (ptarmigan, porcupine, wildfowl, bear, caribou, etc.), berry picking and medicinal plant gathering;

- Monitoring the project's impacts on cultural gatherings and activities near the project area;

- Monitoring of site safety issues;

- An assessment of the planned mitigation measures and whether any changes or enhancements are needed.

Condition 6
Before construction begins, the proponent must submit to the Regional Administrator, for information, a new raptor migration survey report. Should additional mitigation measures be required, the planned measures must be included in the survey report for authorization.

Condition 7
Before construction begins, the proponent must submit to the Regional Administrator, for information, a new bat survey report. The new survey must be conducted in accordance with the most recent provincial protocol for bat surveys (*Protocole d'inventaires acoustiques de chiroptères dans le cadre de projets d'implantation d'éoliennes au Québec* (MRNF, 2008)). Should the survey reveal the presence of bats, the report must include, for authorization, the additional mitigation measures planned.

Condition 8
Before construction begins, the proponent must submit to the Regional Administrator, for authorization, a monitoring program on bird and bat mortalities. A report on bird and bat mortalities must be submitted to the Regional Administrator annually for the first three (3) years of operation and then every ten (10) years until the end of the operation phase. Based on the results, the monitoring reports must indicate whether more frequent monitoring is required to collect additional data and include the additional mitigation measures to be implemented where necessary.

Condition 9
The proponent must avoid all deforestation and clearing activities during the general nesting period in Québec (May 15 to August 15). If not, a survey of the area to be cleared must be conducted, by a skilled and experienced observer, before clearing begins to confirm that no nests are present. If applicable, the proponent must submit to the Regional Administrator, for information, a report discussing the results of the survey.

Condition 10
Before construction begins, the proponent must submit, for information, to the Regional Administrator, a monitoring program on the presence of caribou in the surrounding sector of the project. This program is intended to assess any changes in caribou behaviour. The results of the caribou monitoring program must be shared with the Monitoring and Consultation Committee.

Condition 11
Before construction begins, the proponent must submit to the Regional Administrator, for information, a report on wetland losses, including a prevention and mitigation plan demonstrating the efforts to prevent and mitigate the project's impacts on wetlands and waterbodies.

If wetlands or waterbodies are lost because of the project, the proponent must submit a compensation plan to the Regional Administrator, for authorization, before the end of the construction phase. The compensation plan must be prepared in collaboration with the Monitoring and Consultation Committee and include monitoring of the planned enhancements. The compensation plan must be implemented no later than two (2) years after the operation of the wind turbines.

Condition 12
Before construction begins, the proponent must submit to the Regional Administrator, for information, a report on fish habitat losses, including a prevention and mitigation plan demonstrating the efforts to prevent and mitigate the project's impacts on fish habitat.

If fish habitats are lost because of the project, the proponent must submit a compensation plan to the Regional Administrator, for authorization and before the end of the construction phase. The compensation plan must be prepared in collaboration with the Monitoring and Consultation Committee and include monitoring of the planned enhancements. The compensation plan must be implemented no later than two (2) years after the operation of the wind turbines.

Condition 13
The proponent must submit to the Regional Administrator, for information, a yearly environmental and social monitoring and follow-up report, beginning at the end of the first year of the construction phase. This yearly report must include the progress of the construction work, the problems encountered during regular operations of the project and the solutions put in place and will be based on the data collected the previous year. If necessary, the proponent must include in the report all mitigation measures implemented. The results of this environmental and social monitoring and follow-up report must be shared with the Monitoring and Consultation Committee.

Condition 14
Before construction begins, the proponent must submit to the Regional Administrator, for information, an updated land use plan, drafted in accordance with the *Constitution of the Cree Nation of Eeyou Istchee*. This plan should include:

- a signed resolution indicating that the community has given consent to the proponent to build the project on the selected site;

-a document confirming that the land right is registered in the Cree-Naskapi land registry;

-a permitting plan, which will detail any permits or authorizations required at the local level, for all aspects of the project.

Condition 15
Before construction begins, the proponent must transmit to the Regional Administrator, for information, the signed power purchase agreement with Hydro Quebec.

Condition 16
Every five (5) years during the operation phase of the project, the proponent must submit a report to the Regional Administrator, for information, providing an update on the greenhouse gas emission reductions and diesel fuel savings caused by the project. The proponent will also be required to indicate the proportion of electricity produced and consumed from wind energy. This report must also be submitted to the Monitoring and Consultation Committee.

Condition 17
The proponent must submit to the Regional Administrator, for information, the annual follow-up of the economic impacts and benefits of its project, including a report on the dividends received by the communities. This report must also be submitted to the Monitoring and Consultation Committee.

Condition 18
Before construction begins, the proponent must submit to the Regional Administrator, for information, a training program, and academic requirements necessary for all positions required during the construction, operation and dismantling of the project. The proponent must also submit to the Regional Administrator, for information, an update of its application to the Cree and Inuit Skills Development Program.

Condition 19

The proponent must submit, for information, a yearly report to the Regional Administrator demonstrating what steps were taken to prioritize hiring employees who are residents of the Whapmagoostui First Nation and/or Kuujjuaraapik and beneficiaries of the JBNQA. The proponent must also demonstrate what steps were taken to prioritize awarding contracts to local companies based in The Whapmagoostui First Nation and/or Kuujjuaraapik and beneficiaries of the JBNQA. The report will include a summary of the success of the training and hiring program.

Condition 20

The proponent indicates that an existing sand pit located near the study area (55° 17.113'N; 77° 41.322'W) will likely be used. Any operation of new quarry or sand pit they plan to use must be subjected to an application for authorization from the Regional Administrator and, if applicable, from the Provincial Administrator.

Before construction begins, the proponent must identify to the Regional Administrator all available quarries or sand pits and specify whether other rights holders already have exploitation rights and if so, whether agreements are required.

Condition 21

Before construction begins, the proponent must submit to the Regional Administrator, for information, the emergency measures plan.

Condition 22

Before construction begins, the proponent must inquire about the presence of all archaeological sites located nearby and consult with the Aanischaaukamikw Cree Cultural Institute and the Avataq Cultural Institute.

Any construction work performed in areas with high archaeological potential must be overseen by an archaeologist or a person qualified to recognize archaeological material other than complete objects (flakes, charred bones, hearths, wrought nails, glass beads, etc.).

Condition 23

Before construction begins, the proponent must develop, in collaboration with First Nations, a glossary of place names to identify geographic locations within the designated project area and shall identify on a map all locations included in the glossary. The proponent must submit, for information, the glossary and the map to the Regional Administrator as well as to the Cree Nation Government and the First Nations.

Condition 24

One (1) year after the start of the operation phase, the proponent must submit to the Regional Administrator, for authorization, a plan for the dismantling of the wind turbines, the base of the wind turbines, the access roads and any facilities related to the project. The proponent must also submit a program to secure and restore the site as well as a program for the management and disposal of residual materials resulting from the dismantling of the wind farm. The dismantling plan must be drawn up with the Monitoring and Consultation Committee and updated every five (5) years, and two (2) years before the end of the project.

In the event of the premature termination of the project, the proponent will submit the requested information to the Regional Administrator as soon as possible.

Condition 25

The project that is the subject of this recommendation must be in operation within five (5) years, from the authorization issued by the Regional Administrator. If the project is not operational, the status of the project must be updated and submitted to the Regional Administrator for authorization.