



# AGNICO EAGLE

MELIADINE MINE

## Windfarm Management Plan

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NOVEMBER 2021

VERSION 1\_NIRB



## **EXECUTIVE SUMMARY**

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To support the Meliadine Mine, Agnico Eagle Mines Limited (Agnico Eagle) is proposing to develop a windfarm as part of the Meliadine Extension.

The Windfarm Management Plan is specific to the proposed windfarm and supporting infrastructure during the construction and operation phases. The Windfarm Management Plan will be reviewed and updated prior to the construction, operation, and closure.

The Windfarm Management Plan is a compilation of environmental protection and mitigation measures and management plans from various sources that are intended to address known and anticipated environmental conditions or events that can occur during the windfarm construction and operations, and includes the following activities:

- site preparation
- access roads and waterbody crossings
- temporary workspaces
- turbine foundation and erection
- collector system installation
- decommissioning of temporary workspaces
- clean-up and reclamation

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**DOCUMENT CONTROL**

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Version	Date	Section	Page	Revision	Author
1_NIRB	November 2021	All		First draft submitted in support of the Meliadine Extension application submission to NIRB for review and approval	Permitting Department

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## SECTION 1 • INTRODUCTION

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To support the Meliadine Mine, Agnico Eagle Mines Limited (Agnico Eagle) is proposing to develop a windfarm at the mine site. The Mine is located approximately 25 km north from Rankin Inlet, and 80 km southwest from Chesterfield Inlet in the Kivalliq region of Nunavut. This Plan is a Windfarm Management Plan and forms a component of the documentation series produced as part of the addendum for the Meliadine Extension.

### 1.1 Scope of the Windfarm Management Plan

The Windfarm Management Plan is intended to identify key environmental information, mitigation measures and expectations specific to the construction and operations phase of the windfarm. This a planning tool that describes the implementation of mitigation measures to be applied by Agnico Eagle, its authorized representatives, contractor(s), and subcontractor(s).

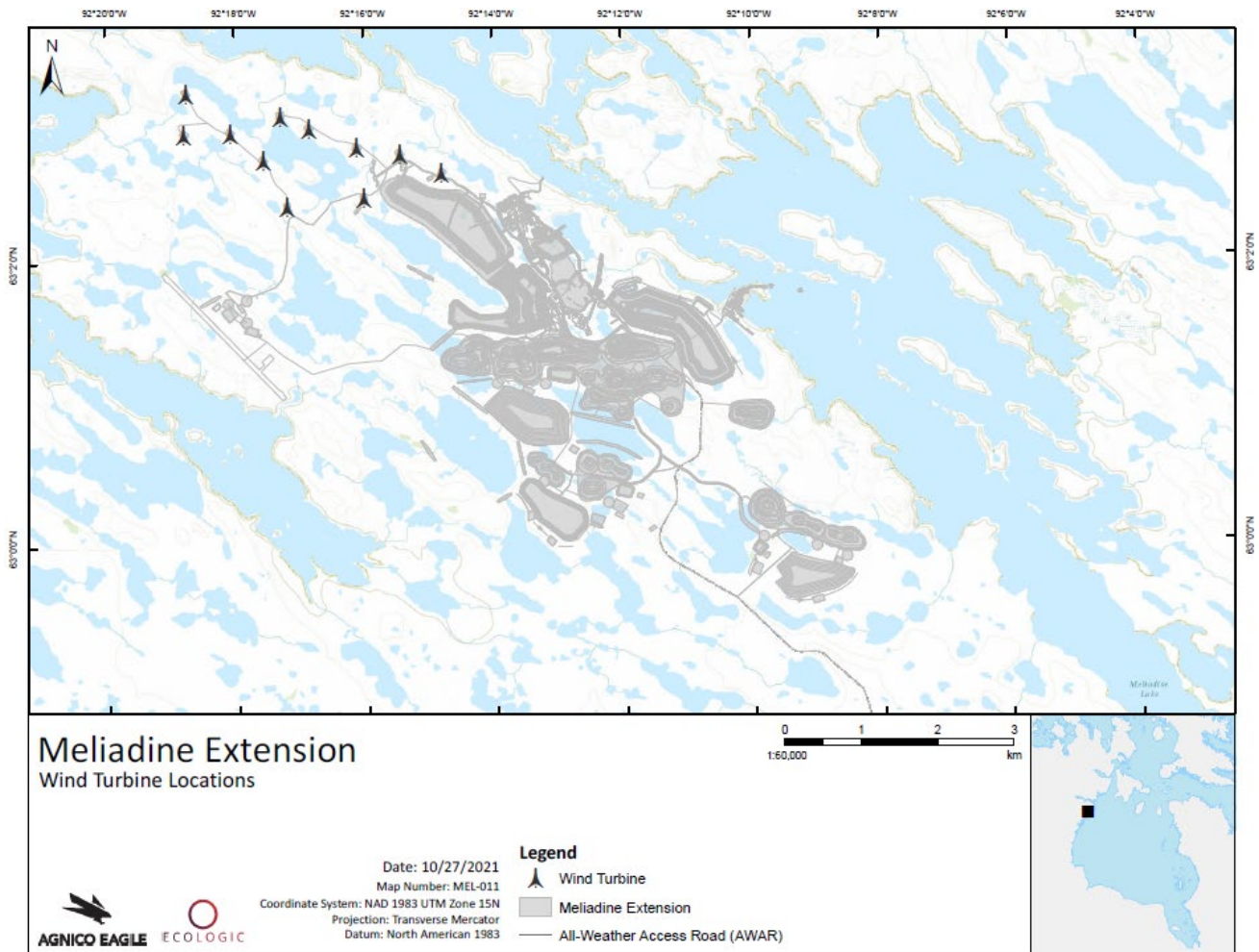
The Windfarm Management Plan has been developed as part of the Meliadine Extension, using the environmental baseline data collected in support of the 2014 FEIS, monitoring data collected following approval in 2015, Agnico Eagle's current approved Management Plans, environmental commitments made in the FEIS, Project Certificate conditions, industry best management practices, and the applicable territorial and federal regulatory requirements as of November 2021.

### 1.2 Windfarm Description

Given the strong average wind speed recorded through the meteorological mast (9.0-9.1 m/s) and the cold temperatures experienced at Meliadine Mine, Agnico Eagle proposes to install the most appropriate model - the Enercon E-115 EP3 E3. The E-115 model features blade de-icing, cold climate capabilities, and other relevant options for an off-grid project like Meliadine. It has a capacity of 4.2 MW, blade tip height of 144.5 m and a hub height of 87 m. Considering Meliadine Mine site power needs, 11 such wind turbines are proposed to be installed and operated (Figure 1). Initially, the wind turbines will supplement the production of the diesel power facility, ultimately meeting the Mine sites power needs with a total of approximately 46.2 MW of installed power (at 100% efficiency).

The windfarm is planned to be built in a phased approach; whereby wind turbines will be constructed based on needs and other economic factors. It is anticipated that five wind turbines (N1 to N5) would be constructed during a first phase. The existing All Weather Access Road (AWAR) and the Rankin Inlet barge landing area will be able to receive and allow transportation of the wind turbine components to the Mine site without requiring modifications.

Figure 1: Wind Turbine Locations



Agnico Eagle will look for opportunities to use clean open pit waste rock material for construction requirements from the borrow pits and/or quarry sites; however, Agnico Eagle has assumed additional material will be needed to complete the construction of the access roads to the wind turbines and laydown areas. All construction material will be from non-potentially acid generating (non-PAG) and non-metal leaching tested sources. Heavy equipment from the Mine will be used where feasible, and extra equipment will be rented and barged in and out of the site via Rankin Inlet, as required.

Once all approvals are received, the access roads and 100x100 m turbine platforms will be developed, including any required temporary crane pads and laydown areas. Pile holes will be drilled up to 10 to 12 m below the ground surface to reach bedrock, and rebar and concrete will be installed. A 160-ton mobile crane will be used to pick the turbine components and to assemble the 600-ton crawler crane to facilitate the installation of the turbines. Other equipment anticipated to be required for construction includes



excavators, trucks, loaders, bulldozers, drills and graders, and these are anticipated to be sourced from the Mine site.

While the turbines are being put in place, a 12.5 kilovolt (kV) collection system will link the wind turbines to the Mine powerhouse. The power cable is spooled out and installed directly over ground, following the access road paths; a 1 m wide right-of-way for the power cable will be maintained adjacent to the access roads. Each turbine houses a 690V/12.5kV transformer which connects via the power cables to a spare switchgear located in the main electrical room of the Mine powerhouse.

The energy produced by the wind turbines will be stored in an energy storage system that is known as a Lithium-Ion Batteries system. This system works well in cold and remote environments, and only requires a small footprint because of its high energy density. The storage system will provide grid stability with fast system transients and it can support the loss of power from one or a few turbines for enough time to restart a generator to maintain the reliability of the power supply.

### 1.3 Related Documents

The Windfarm Management Plan should be read in conjunction with the other approved Management Plans, including the following:

- Terrestrial Environment Management and Monitoring Plan
- Borrow Pits and Quarries Management Plan
- Hazardous Materials Management Plan
- Landfill and Waste Management Plan
- Roads Management Plan
- Sediment and Erosion Management Plan

## SECTION 2 • ENVIRONMENTAL REGULATORY REQUIREMENTS AND COMPLIANCE

### 2.1 Approvals, Permits and Licenses

Agnico Eagle is responsible for obtaining all necessary permits, approvals, notifications, and clearances required prior to construction and operation. Relevant environmental regulations and requirements applicable to the windfarm includes:

- An aeronautical obstruction clearance from Transport Canada is required
  - *Aeronautics Act* (Government of Canada 1985)
  - Canadian Aviation Regulations (Government of Canada 1996a)
- A land use clearance from NAV Canada is required for proposed land development near airports and air navigation infrastructures before construction begins.
  - Civil Air Navigation Services Commercialization Act (Government of Canada 1996b)

Dependent on detailed design and final configuration of the windfarm the final list of permits may change.

### 2.2 Environmental Inspection and Training

Agnico Eagle will oversee implementation of the environmental management measures described in the Windfarm Management Plan during construction and operation activities. Agnico Eagle will employ the services of qualified Environmental Technician(s) to guide implementation, monitor and report on the effectiveness of the construction procedures and mitigation measures for minimizing potential impacts.

Agnico Eagle will provide environmental orientation to personnel who will be made aware and understand commitments, their obligations and duties described in the Plan.

### 2.3 Key Environmental Features

The recommended construction timing windows and restrictions that are expected to apply during the construction of the windfarm are summarized in Table 1. Additional timing windows and restrictions will be confirmed as the windfarm planning and design progress.

**Table 1: Recommended Construction Timing Windows and Restrictions**

Natural Feature, Habitat, or Species	Recommended Timing Window	Recommended Restrictions
Plant populations and communities	Not applicable	<ul style="list-style-type: none"> <li>• To be avoided to the extent practicable</li> </ul>
Listed (rare) plant species	Not applicable	
Traditional use plant species	Not applicable	
Wildlife denning site	Denning period varies per species	<ul style="list-style-type: none"> <li>• Recommended setbacks from denning sites vary from 20 m to 1,500 m depending on activity and the species</li> </ul>

**Table 1: Recommended Construction Timing Windows and Restrictions**

Natural Feature, Habitat, or Species	Recommended Timing Window	Recommended Restrictions
Upland birds (including migratory birds)	Migratory bird nesting period: <b>May 15 to September 15</b>	<ul style="list-style-type: none"> <li>• Construction activities are to be completed prior to the nesting season.</li> <li>• Recommended setbacks from nesting sites vary from 20 m to 300 m depending on the species</li> </ul>
Waterbirds	Migratory bird nesting period: <b>May 15 to August 15</b>	<ul style="list-style-type: none"> <li>• Construction activities are to be completed prior to the nesting season.</li> <li>• Recommended setbacks from nesting sites vary from 20 m to 750 m depending on the species</li> </ul>
Raptors	Breeding Period: <b>May 15 to June 30</b>  Hatching Period: <b>July 10 to July 20</b>	<ul style="list-style-type: none"> <li>• Construction activities within the recommended 1,000 m setback from an active nesting site will be avoided during the breeding and hatching period.</li> </ul>
Waterbodies(b)	Critical Period for Fish: <b>May 1 to July 15</b>	<ul style="list-style-type: none"> <li>• When construction schedule allows, construction activities (e.g., installing or removing waterbody crossing structures) below the high-water mark will be completed in winter when waterbodies are frozen or when the watercourse is dry.</li> </ul>
Archaeological resources – land use sites	Not applicable	<ul style="list-style-type: none"> <li>• Archaeological resources will be avoided (i.e., relocate windfarm component) and protected to the extent feasible.</li> </ul>
Archaeological resources – archaeological sites	Not applicable	<ul style="list-style-type: none"> <li>• Archaeological resources will be avoided (i.e., relocate windfarm component) and protected to the extent feasible.</li> <li>• If avoidance is not feasible mitigation and monitoring will be implemented for archaeological sites that are located within 30 m of a windfarm component.</li> </ul>

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## SECTION 4 • ENVIRONMENTAL MANAGEMENT DURING THE CONSTRUCTION PHASE

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### 4.1 Site Preparation

Site preparation includes activities such as surveying and flagging the access roads, 100x100 m turbine platforms, and temporary workspaces. The approved windfarm locations, environmental features and other hazards will be clearly staked and flagged prior to start of construction. The site preparation environmental protection and mitigation measures include, but are not limited to:

- Timing windows outlined in Table 1 are to be respected; if they cannot be avoided, Agnico Eagle may bring in the appropriate resource specialist to survey the area for sensitive features
  - Prior to the start of construction, Avian Use Surveys and Breeding Bird surveys as described in the TEMMP will be completed in spring (June) by a qualified avian biologist or experienced naturalist to inform fly routes and heights, species richness and abundance.
  - Prior to the start of construction, the windfarm location will be surveyed by a qualified biologist or experienced naturalist for wildlife dens and nests. If dens or nests are discovered, Agnico Eagle will implement recommended timing windows and setback.
- The 30 m area extending from the ordinary high-water mark surrounding the waterbody will be flagged prior to the start of construction.
- Flags or stakes around environmentally sensitive features will be inspected on a regular basis so that they are in place and maintained during construction.
- When construction activities occur within 30 m of an archaeological site, site-specific mitigation measures and monitoring will be implemented.

### 4.2 Access Roads, Temporary Workspaces, Turbine Platform and Foundation, Collections System Installation

Roads to access the windfarm will either use existing roads or will require construction of new access roads at the Mine. During construction of the access roads, materials used for construction will be placed directly over the existing soil layer to avoid disturbance to the subgrade soils, the active layer, and permafrost. The roads will be sloped to allow ease of wildlife passage.

Construction of the temporary workspaces (e.g., laydown areas) will be conducted prior to start of turbine foundation and assembly activities. The construction of the temporary workspaces will include surveying and flagging, grading, and installation of erosion and sedimentation controls, as required.

Following the construction of the 100x100 m turbine platforms, drills will bore the pile holes, rebar will be installed and concrete poured in. The turbine platforms will be installed by sitting the prefabricated steel structure on the piles and then backfilling with coarse aggregate material. The wind turbine assembly and erection will commence once the turbine components have been delivered directly to each foundation site and any required piling and turbine platforms are in place. Wind turbine foundation and

erection activities will include surveying and staking, drilling, pouring concrete, backfilling and water management.

While the turbines are being put in place, a 12.5 kV collection system will link the wind turbines to the Mine powerhouse. The collection system and fiber optic cable will be installed along the access roads and will consist of airguard-type cables laid directly over the ground surface, not on poles.

Environmental protection and mitigation measures include, but are not limited to:

- Access to the windfarm locations will be controlled directly at the access point for the Mine.
- The TEMMP will be adhered to when caribou are in the area of access roads.
- Temporary workspaces will be designed to reduce the overall windfarm footprint and will be located within previously disturbed areas as shown on the Figure 1.
- Agnico Eagle's Roads Management Plan will be adhered to.

#### **4.3 Decommissioning of Temporary Workspaces, Clean-up, and Reclamation**

Temporary workspaces that are not required for the windfarm operational phase will be decommissioned following completion of construction. The windfarm clean-up activities, such as removal of refuse, will take place throughout the construction phase. The reclamation of temporary workspaces will be conducted after they have been decommissioned. The protection and mitigation measures to be implemented during cleanup and reclamation include, but are not limited to:

- Clean-up will be completed immediately after construction completion.
- Flagging, signage, or other markings will be removed upon construction completion.
- All waste, geotextile, silt fencing, filter fabric, wood debris, and other waste will be removed and disposed as per the Landfill and Waste Management Plan.

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## SECTION 5 • ENVIRONMENTAL MANAGEMENT DURING THE OPERATIONAL PHASE

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Upon commissioning, the windfarm will operate on a continuous basis and will be maintained by Agnico Eagle. Operation and maintenance activities will be conducted in accordance with permits and regulations. Typical operation and maintenance activities include:

- generation of electricity
- switching wind turbines on/off depending on the suitability of the wind resources in generating electricity
- inspection and maintenance of wind turbines, turbine platforms, and access roads
- inspection, maintenance and testing of other electrical infrastructure including aboveground collection cables
- inspection and maintenance of erosion management measures
- maintenance of the powerhouse (which will be managed as part of the Mine and under its own operation management plans)

### 5.1 Windfarm Operation

Potential impacts related directly to the operation of the turbines and require the implementation of the mitigation measures include, but are not limited to:

- Agnico Eagle will adhere to the lighting and marking requirements under *the Canadian Aviation Regulations Standard 621 – Obstruction Marking and Lighting* for the operation of wind turbine.
- The turbines will be equipped with sensors that detect imbalances within the rotor system, such as the imbalance that would result from ice accretion.
- Noise control measures will be implemented.
- The blades of wind turbines will be equipped with trailing edge serrations to reduce noise emissions.
- Agnico Eagle's TEMMP will be adhered to.

### 5.2 Windfarm Maintenance

Potential impacts relate directly to the maintenance of the turbines and require the implementation of the mitigation measures include, but are not limited to:

- Where accumulations of dirt and debris are excessive, surfaces will be scraped or swept prior to blowing with compressed air or flushing. All material scraped loose will be collected for proper disposal.
- All necessary precautions will be taken to prevent the discharge of any harmful substance into a waterbody, and all empty cleaner containers will be disposed of in an appropriate manner.
- The spill prevention and response mitigation measures per the Spill Contingency Plan will be implemented.

- For safety, the critical devices (e.g., the rotor, generator) will be equipped with double redundant protection systems.

### 5.3 Windfarm Monitoring

Monitoring measures to be implemented to monitor the effectiveness of mitigation measures, to manage environmental concerns, and to implement remedial measures as needed are provided in Table 2.

**Table 2: Monitoring Measures**

Valued Component	Program Objective	Suggested Frequency and Location
Noise	<ul style="list-style-type: none"> <li>• To verify that the noise emissions used in the Meliadine Extension FEIS Addendum and noise assessments were reasonable, yet conservative.</li> <li>• To verify that noise mitigation measures considered integral to the windfarm are incorporated as planned and are effective.</li> </ul>	<ul style="list-style-type: none"> <li>• Agnico Eagle's Noise Monitoring Program will be adhered to.</li> <li>• Noise surveys will target up to two of the existing noise points of reception (NPORs) where effects are predicted to be greatest (e.g., NPOR06).</li> <li>• Noise surveys will be conducted when NPOR cabins are unoccupied to reduce contamination from non-Project noise sources such that that measured noise levels can be attributed to Project-related effects.</li> </ul>
Vegetation	<ul style="list-style-type: none"> <li>• Monitoring of naturally re-vegetated areas that were disturbed during construction.</li> <li>• Monitoring of effects to plant health from dust deposition.</li> </ul>	<ul style="list-style-type: none"> <li>• Vegetation and soil sampling will occur every three years during the growing season consistent with the TEMMP.</li> </ul>
Wildlife	<ul style="list-style-type: none"> <li>• Assessment of the potential wildlife displacement: <ul style="list-style-type: none"> <li>– Avian use surveys</li> <li>– Breeding bird surveys</li> </ul> </li> <li>• Mortality monitoring to estimate avian mortality rates.</li> </ul>	<ul style="list-style-type: none"> <li>• Mortality monitoring will occur on a weekly basis from June 15 to August 15 during the first three years of operation (CWSa; CWSb).</li> <li>• Mortality (carcass) searches coupled with searcher efficiency and scavenger impact trials.</li> </ul>

### 5.4 Windfarm Decommissioning

The expected lifetime of the windfarm is between 20 and 25 years, at which time the turbines or aging turbine components may be replaced, or the windfarm may be decommissioned entirely. Decommissioning of the windfarm will be included in the Final Closure and Reclamation Plan.

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**SECTION 6 • REFERENCES**

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