The study area was therefore ascribed low potential for encountering early Euro-Canadian archaeological resources (CRM Group 2021).

An Archaeological Reconnaissance consisting of a walkover of portions of the Project Area with a specific focus on proposed turbine locations and impact areas is recommended by CRM Group prior to any ground disturbance activity.

6.4.2 Existing and Historic Land Uses

Archaeological records indicate that the proposed Project area and vicinity were utilized and occupied by the Mi'kmaq from at least the Archaic Period to the historic period (10,000 B.P. to present) and by European settlers from at least the second half of the seventeenth century. From 1896 to 1911, businessman S.P. Benjamin operated a sawmill on the West Branch Avon River. As part of the history of forestry in the region, in 1937, several woodlots within the Project Area were transferred from the Windsor Lumber Company to the Crown (CRM Group 2021).

Today, the Project Area consists of both privately-owned lands and Crown Lands owned by the Province of Nova Scotia. Presently, the privately-owned lands are used for forestry activities and Crown Lands are open to a variety of uses.

7.0 Effects of the Undertaking on the Environment

The potential interactions with the surrounding environment have been considered in terms of each distinct Project phase and corresponding activities associated with the Project as planned. Interactions due to accidents, malfunctions and unplanned events can be found in **Section** 7.5.

The initial screening (i.e., project interaction matrix) provided in Table 25 assists in determining if an interaction between the activities being carried out in each Project phase and the VEC. A qualitative rating system was used to evaluate the potential for interactions is possible between the Project and the environment. One of the following two ratings was prescribed for each individual VEC:

- An interaction between the Project and the environment could occur (which is identified with as 'x' in the matrix below), which are carried forward for further assessment; or
- No interaction occurs between the Project and the environment (which is identified by a blank cell in the matrix below), and therefore no further assessment is required and the interaction is not discussed further.

Based on the Project description (refer to **Section 2.0**), the VECs (refer to **Section 6.0**), and the scope of the EA, the potential interactions between the Project and the environment are summarized in Table 25 below.

TABLE 25: POTENTIAL PROJECT INTERACTIONS WITH VALUED ENVIRONMENTAL COMPONENTS

Valued Environmental Components		Site Preparation and Construction						Operations and Maintenance		Decommissioning		Accidents, Malfunctions and Unplanned events
		Clearing and Grubbing	Turbine Foundation	Electrical Works	Turbine Installation	Commissioning	Restoration of the site	Turbine Operation	Inspection and Maintenance	Infrastructure Removal	Site Reclamation	
Atmospheric Environment	Weather Conditions											
	Climate and Climate Change							x				
	Ambient Air Quality	x	x								x	x
	Ambient Noise Levels	x	x		x		x	x		x	x	
Physical Environmental Setting	Geology	x										x
	Surface Water	x		x						x	x	x
	Groundwater	x		x							x	x
Visual Environment	Shadow Flicker							x				x
	Visual Aesthetics	x						x				x
Terrestrial Environment	Vegetation	x	x	x			x			x	x	x
	Wildlife	x		x				x		x	x	x
	Wetlands	x	x	x			x			x	x	x
Birds	Birds and Bird Habitat	x		x				x			x	x
Bats	Bats and Bat Habitat	x		x				x				x
Aquatic Environment	Fish and Fish Habitat	x		x			x				x	x
SAR	SAR and SOCC	x		x			x	x			x	x
Socioeconomic Environment	Economy	x	x	x	x	x	x	x	x	x	x	
	Land Use and Value	x						x		x	x	x
	Transportation	x			x					x	x	x
	Recreation and Tourism							x				
	Human Health and Safety											x
Cultural and Heritage Resources	Archaeological and Cultural Resources;	x	x	x				x			x	x
	Existing and Historical Land Uses	x	x	x	x		x	x		x	x	x

7.1 Physical VECs

7.1.1 Atmospheric Environment

The potential interactions between the Project activities during all phases and the atmospheric environment are assessed in this section.

7.1.1.1 Weather Conditions

WTGs take up a very small space within the troposphere, the layer of the atmosphere which creates the local weather (NOAA 2021). Although the Project will harness some of the energy produced by the predominant winds at the Project site, the Project itself is not anticipated to interact, or change, the current average weather conditions at the Project site.

7.1.1.2 Climate and Climate Change

Potential Interactions and Mitigation

The purpose of the Project is to provide renewable energy to the Province of Nova Scotia to help reach goals of producing 80% of electricity from renewables by the year 2030. By reaching these targets, there will be a significant reduction in greenhouse gas emissions through the reduction of fossil fuel use in the energy sector. This reduction in greenhouse gas emissions will help global efforts of slowing climate change and will help mitigate the associated risks.

The potential interactions of the Project in relation to climate change and proposed mitigative measures are summarized in Table 26.

TABLE 26: POTENTIAL INTERACTIONS AND PROPOSED MITIGATIVE MEASURES FOR CLIMATE AND CLIMATE CHANGE

Potential Interactions with Climate	Proposed Mitigative Measures
The electricity produced from this Project will supply Nova Scotia with clean renewable energy, reducing fossil fuel use.	• Reducing reliance on fossil fuels is a positive impact. No mitigation is proposed.
The Project will help the province in achieving renewable energy goals in an attempt to reduce emissions and slow climate change and associated risks.	• Reducing reliance on fossil fuels is a positive impact. No mitigation is proposed.

Significance of Residual Effects to Climate

The Project will help global long-term efforts to slow climate change and as such, the significance of residual effects on climate is to be considered beneficial. No negative effects of the Project on climate are anticipated.

7.1.1.3 Ambient Air Quality

Potential Interactions and Mitigation

As with any construction project, some emissions to the atmospheric environment are anticipated due to the operation of heavy mobile equipment and vehicles and the release of fugitive dust particles. These emissions are expected during Project activities that require the use of heavy machinery, particularly within the construction (e.g., civil, electrical, install and site restoration) and decommissioning phases of the Project. Potential temporary changes to the local air quality may occur as a result of the generation of emissions of fugitive dust and particulate matter from material movement as well as combustion emissions associated with the heavy equipment. The potential interactions of the Project with the ambient air quality and proposed mitigative measures are summarized in Table 27.

TABLE 27: POTENTIAL INTERACTIONS AND PROPOSED MITIGATIVE MEASURES FOR AMBIENT AIR QUALITY

Potential Interactions with Ambient Air Quality	Proposed Mitigative Measures
Vehicle traffic and the use of equipment associated with on-site work and transport of materials on- and off-site could increase emissions of combustion gases and greenhouse gases to the atmosphere during construction and decommissioning phases.	• Vehicles and equipment will be maintained in proper working order; • All vehicles and machinery will comply with current emission standards and will be used efficiently, minimizing distances travelled when possible; • Vehicle idling will be minimized where possible; • A speed limit will be enforced to reduce unnecessary emissions and enhance safety; • Contractor car-pooling will be encouraged; and • Low sulphur fuel will be used in combustion engines, when possible.
Local air quality may be affected through fugitive dust from the access road and earth work activities during construction and decommissioning	• Fugitive dust during dry weather conditions may be controlled with the application of water or an environmentally benign dust suppression product; • Water used to minimize fugitive dust will be obtained from a clean source and, if available, within the local watershed; • Proper air quality control measures following the Environmental Management and Protection Plan (Appendix O) will be instated; and • Earth work activities will be paused, where possible, during periods of significant winds.

Significance of Residual Effects to the Ambient Air Quality

It is noted that current equipment is, and will continue to be used in the Project area due to the ongoing forestry operations. As for the Project, not all equipment will be operated at the same time during the difference project phases. Fugitive emissions of particulate matter (including dust) and those associated with fuel combustion in heavy equipment will largely be localized to the construction and decommissioning activities within the immediate area and within the Project site. Due to the limited footprint of the Project, the temporary nature of the activities, the composition of the materials being handled (i.e., soil and gravel) in addition to the rural setting of the Project with the nearest residential receptor being approximately 1.6 km away, fugitive emissions, if any, are expected to be minimal, very localized, and are not anticipated to negatively contribute to local or regional air quality. In addition, given the relatively low magnitude of emissions associated with the Project, greenhouse gas emissions are expected to be low and unsubstantial for the scale of the Project.

The Project will help global long-term efforts to slow climate change by producing emission free electricity and as such, the significance of residual effects on ambient air quality is to be considered beneficial.

Given anticipated limited interactions with the ambient air quality, no follow-up or monitoring is proposed to monitor environmental interactions.

7.1.1.4 Ambient Sound Levels

Potential Interactions and Mitigation

The Proponent has conducted an operational sound level impact assessment of a 2.0 km area surrounding the proposed turbine locations. This was completed in alignment with the Guide to Preparing an EA Registration Document for Wind Power Projects in Nova Scotia and by modelling the turbine locations, turbine model, receptor locations and local topography using the Decibel module of the WindPRO software v3.5. This assessment includes a total of 64 receptors representing dwellings within 2.0 km of the proposed turbine locations.

Prior to this assessment, careful siting of the turbines has reduced the majority of sound impacts to neighbouring residents. Based on the Guide to Preparing an EA Registration Document for Wind Power Projects in Nova Scotia, the maximum allowable sound level from wind turbines at a receptor is 40 dB[A] in Nova Scotia.

The results of the sound level prediction model are summarized in Appendix C. The sound levels at all 64 receptors comply with the Guide to Preparing an EA Registration Document for Wind Power Projects in Nova Scotia. As such, the modelled sound levels emitted by the Project are less than the maximum of 40 dB[A]. The maximum sound predicted by the Decibel module of windPRO v3.5 at a nearby receptor was 32.3 dB(A) based on the worst-case scenario sound assessment. The worst-case sound assessment followed a conservative methodology in calculating sound levels by assuming downwind propagation is occurring simultaneously in all directions of the wind turbines. Sound propagation in an upwind direction would result in a significant reduction of sound levels at any receptor located upwind from the turbine. A detailed list of the sound assessment assumptions and methodology is included in Appendix C.

Infrasound describes sounds with a frequency less than 20 Hz and can occur when large masses are in motion (Leventhall, 2007). The movement of wind turbine blades has generated infrasound in the local environment in some cases (Bolin et al., 2011). An additional assessment was completed through the Finland Low Frequency module of windPRO v3.5. This assessment showed a minimum frequency of 80 Hz observed at all receptors within 2 km of the Project. The results of the infrasound modeling show that the infrasound is not expected at the receptors since the lowest frequency created by the Project is expected to be much higher than the frequency designated as infrasound (20 Hz or less).

In addition to modelling for infrasound, research was conducted to evaluate its impact on local residents living near wind turbines. The results of this research lead to the review of a study conducted by the Massachusetts Institute of Technology which found that infrasound near wind turbines does not exceed audibility thresholds. However, epidemiological studies have shown a relationship between living near turbines and annoyance. Annoyance seems strongly related to the individuals' characteristics rather than noise from turbines. The studies also established that infrasound and low-frequency sound do not present unique health risks. (McCunney et. At., 2012)

Construction noise is not always constant and can produce impulsive and variable sounds at different noise levels, which could create heightened annoyance levels in the surrounding community. The construction noise assessment has considered the maximum noise levels produced by various

construction equipment to determine maximum sustained noise levels when all expected equipment is running.

General construction activities include those associated with vegetation clearing, road building, foundations, and turbine erection or decommissioning. These activities will likely involve the use of backhoes, concrete mixers and pumps, cranes, dump trucks, excavators and light-duty pick-up trucks with the associated sound levels predicted in Table 28.

TABLE 28: SOUND POWER LEVELS ASSOCIATED WITH CONSTRUCTION EQUIPMENT (WSDOT 2017).

Equipment	Max Sound Power Level (dB{A})
Backhoe	78
Concrete Mixer	79
Concrete Pump	81
Crane	81
Dump Truck	76
Excavator	81
Pick-up Truck	75

It is not expected that all equipment would be running at the same time, but to determine maximum expected sound levels during construction, the WSDoT (2017) guidelines for decibel addition were used to conclude that 86 dB[A] is the highest expected sound level during combined construction activities.

The environment in which the Project construction will occur is considered a soft environment with normal unpacked earth. The normal unpacked earth and topography will facilitate attenuation of noise emissions at shorter distances. Table 29 identifies the sound levels predicted to be observed at various distances from the construction site determined using WSDoT (2017) guidelines.

TABLE 29: WORST-CASE SOUND LEVELS IN THE SURROUNDING ENVIRONMENT CALCULATED USING WSDOT (2017) GUIDELINES*

Distance	Construction Sound Level (dB[A])
50 ft. (15.2 m)	86
100 ft. (30.5 m)	78.5
200 ft. (61 m)	71
400 ft. (122 m)	63.5
800 ft. (244 m)	56
1600 ft. (488 m)	48.5
3200 ft. (975 m)	41

* Assumes Sound Levels in Soft Environment Attenuates at -7.5 dB[A] per Doubling of Distance

Many sound level scales refer to 70 dB[A] as an arbitrary base of comparison where levels above 70 dB[A] can be considered annoying to some people (Purdue University 2017). As indicated in Table 29, at

61 m from the construction site, noise levels are approximately 70 dB[A], similar to that of a car travelling at 100 km/h and just at the threshold of possible annoyance (Purdue University 2000). Also indicated in Table 29, sound levels from the construction site reach approximately 40 dB[A] at 1 km from the site. With the nearest dwelling located approximately 1.6 km from a proposed turbine, construction noise is not expected to impact dwellings in the area. Further, the construction noise is not expected to be annoyingly high beyond 61 m from the construction site as sound levels at this distance have already attenuated to approximately 70 dB[A].

Additionally, this site has been chosen due to its excellent wind resource. Wind generally increases ambient sound levels in an area and in combination with the vegetative cover will aid in making construction noise less noticeable at even shorter distances (WSDoT 2017). Dense vegetation is estimated to reduce noise levels by as much as 5 dB for every 100 ft (30.5 m) and wind is estimated to reduce noise levels by as much as 20-30 dB at long distances (USDOT 1995).

The potential interactions of the Project with the ambient sound levels and the proposed mitigative measured are summarized in Table 30.

TABLE 30: POTENTIAL INTERACTIONS AND PROPOSED MITIGATIVE MEASURED FOR AMBIENT SOUND LEVELS

Potential Interactions with Ambient Sound Levels	Proposed Mitigative Measures
Sound levels generated during operation of the wind turbines has the potential to disturb the surrounding area.	• A sound level impact assessment has been conducted that shows the worst-case scenario sound levels that can be expected at nearby dwellings are below provincial guidelines of 40 dB{A}; • A complaint resolution plan has been developed to address sound level concerns; • Turbine locations have been sited in order to comply with provincial wind turbine sound level guidelines; • The wind turbine model selected for the Project will incorporate noise reduction technologies to mitigate sound levels generated by the moving blades, if feasible; and • Clearing of flora on the Project site will be minimized to aid in attenuation of sound levels.
Sound levels generated during site preparation and construction, and decommissioning activities by the use of equipment and machinery has the potential to disturb the surrounding area.	• Site preparation, construction, and decommissioning activities will be limited to daytime hours, when feasible; • A complaint resolution plan has been developed for handling sound level concerns; • Proper sound level management measures following the Environmental Management and Protection Plan (Appendix O) will be instated; • Clearing of flora on the Project site will be minimized to aid in attenuation of sound levels; and

Potential Interactions with Ambient Sound Levels	Proposed Mitigative Measures
	• Construction schedules will be provided to nearby residents and posted on the signage at the entry to the site prior to the commencement of construction activities.
Infrasound from the wind turbines during operation has the potential to disturb the surrounding area.	• Infrasound from wind turbines is not anticipated to be a concern based on the project modeling and given the distance the wind turbines are located relative to dwellings.

Significance of Residual Effects

Elevated sound levels caused by the construction and decommissioning phases will be temporary, during the day when possible, and short term. Sound level production from the turbines during operation have been mitigated by setback distances and confirmed by a sound level impact assessment. By using the mitigation identified above, the Project is not anticipated to have any significant residual environmental effect on sound levels for humans or wildlife outside the Project site. While any effect on ambient noise will be negative, the significance of residual effects on ambient noise is considered negligible and no follow up monitoring post-construction is recommended.

7.1.2 Physical Environment

7.1.2.1 Geology

Potential Interactions and Mitigation

The construction of the Project will require the excavation of material in order to support the turbine foundations, and the grading and filling for the crane pads and access roads. The geophysical conditions will be disturbed for the construction and installation of the Project.

The potential interactions of the Project with geology and the proposed mitigative measures are summarized in Table 31.

TABLE 31: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION FOR GEOLOGY

Potential Interactions with Geology	Proposed Mitigative Measures
Soil and ground conditions may need to be altered or blasted for construction.	• A geotechnical survey will determine the ground conditions and any potential limitations to construction; and • A designated professional will provide recommendations for design and construction of the Project based on the geotechnical surveys.
Excavation and transportation of material will be required for turbine foundations, crane pads and access roads.	• Topsoil will be stored separately from excavated material; • Topsoil and excavated material will be backfilled in a manner that does not result in soil inversion; • Areas susceptible to erosion will be stabilized and erosion will be minimized through the use of control measures (i.e. hay bales, coco mats, etc.);

Potential Interactions with Geology	Proposed Mitigative Measures
	• Soil compaction will be limited to the Project footprint; • Soil and aggregate mixing will be minimized; and • Soil will be visually and olfactory inspected during earth moving activities and identification of any contaminated soils will be reported to NSE and managed utilizing Nova Scotia Contaminated Site Regulations.

Significance of Residual Effects

It is expected that there will be disturbance to the local geophysical conditions for each WTG, the substation and at localized areas for the access roads. The impact is predicted to be of small magnitude and within the immediate area of the site infrastructure. The significance of residual effects on geology after applied mitigation measures is considered to be negligible and no follow up monitoring is recommended unless contaminated soil is encountered in which case, it will be managed utilizing Nova Scotia Contaminated Site Regulations.

7.1.2.2 Surface Water

Potential Interactions and Mitigation

Potential interactions with surface water from physical alterations of the Project areas during the construction phase are anticipated. The main interaction will be changes in the flow of surface water across the Project areas due to road construction and expansion activities that occur in or next to streams and that change the topography of the area. Interaction may occur during clearing and grubbing, and access road and laydown area construction, as well as during eventual infrastructure removal and site reclamation activities.

The potential interactions of the Project with surface water and the proposed mitigative measure are summarized in Table 32.

TABLE 32: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION FOR SURFACE WATER

Potential Interactions with Surface Water	Proposed Mitigative Measures
Vegetation clearing, grubbing, ground stripping, excavation and machinery traffic during the construction, road widening and construction, and decommissioning phases might induce a change in hydrology or sediment input into surface water.	• A plan for handling fill and construction materials for the site will be communicated to the contractor (i.e., if stockpiling is required, materials will be stored away from any watercourse or removed from site to a predetermined location) with an intent to minimize soil stockpiled, and the duration that soil is stockpiled at the site; • Fill and excavated materials will not be stockpiled for long periods of time to reduce the likelihood of sedimentation; • Weather will be monitored and additional erosion control measures such as the installment of hay bales and check dams/silt fences will be employed, as appropriate, should stockpiled fill be present in unexpected heavy rain events;

Potential Interactions with Surface Water	Proposed Mitigative Measures
	• Work will not be conducted during heavy rain events to minimize the movement of exposed soils, where practical; • Exposed soils will be stabilized as soon as practical to minimize emissions of fine particulate matter and soil erosion; • A NSECC watercourse alteration permit will be obtained prior to any work within a watercourse; • A Request for Review will be submitted to DFO under the Fisheries Act where necessary; • Work will be completed away from watercourses where possible and water course crossings will be minimized where possible • Earth work activities will be conducted in such a way that general overland flow directions are maintained and surficial flow during high storm events does not direct water to new areas; and, • Where possible, exiting roads that cross water courses will not be widened.

Significance of Residual Effects

Construction activities during the Construction and Decommissioning Phases have the potential to result in changes to surface water without the proper mitigation. Interactions are not expected during the Operation and Maintenance phase due to the passive nature of that phase. Construction activities are not anticipated to occur in watercourses, however if required will be minimized to the extent possible. With the implementation of the planned mitigation indicated above, including obtaining a Watercourse Alteration permit for activities with the potential to alter the watercourse, interactions between the Project and surface water are not anticipated to be substantive and are limited to the local environment temporarily during the construction and decommissioning phases.

Should Project activities be required directly within watercourses, either further assessment or follow-up or monitoring may be required to monitor environmental interactions with the physical environment.

7.1.2.3 Groundwater

Potential Interactions and Mitigation

Potential interactions with groundwater may occur during the clearing and grubbing activities for the construction of the access roads and infrastructure areas, as well as during eventual Project decommissioning and site reclamation activities. In addition, excavations to below ground level during the construction phase of the Project for turbine foundations may result in interactions with groundwater.

A geotechnical investigation will be conducted for the Project and if shallow groundwater is encountered during these surveys, depth to groundwater will be recorded. In light of the considerable distance between the Project site, Wellhead Protection Areas, Protected Water Areas, and residential areas, there are expected to be no impacts of the Project on the Wellfield or drinking water supplies.

The disturbance of bedrock potentially containing uranium has the ability to introduce or increase uranium into the groundwater. The potential for this interaction to occur is currently being studied and potential mitigation strategies may be employed following this assessment.

The potential interactions of the Project with groundwater and the proposed mitigative measures are summarized in Table 33.

TABLE 33: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION FOR GROUNDWATER

Potential Interactions with Groundwater	Proposed Mitigative Measures
Vegetation clearing, grubbing, ground stripping, excavation and machinery traffic during the construction and decommissioning phases might induce a change in ground water.	• Where possible, clearing shall take place in the winter months on frozen ground; • Where water must be pumped out of excavation pits, it will not be discharged into a wetland, watercourse or defined channel. If pumped water contains total suspended solids the water will be pumped to vegetated land with gentle slope to allow sediment to filter, or the water will be filtered before release with a filter bag; and • Used oil filters, grease cartridge containers and other products associated with equipment maintenance shall be collected and disposed of in accordance with regulatory guidelines.
Construction activities may disturb uranium deposits in the bedrock and increase uranium in groundwater.	• Geotechnical studies will be carried out to assess the composition of the ground and bedrock; and • A study is being carried out to assess the potential of this interaction and the appropriate prevention and mitigation techniques.

Significance of Residual Effects

After employing the proposed mitigative strategies, should any bedrock disturbance occur during construction or decommissioning it will be temporary, of small magnitude and contained. While any direct release into ground water would be a negative effect, it will be of small magnitude, of short duration and local. The significance of residual effects on groundwater is considered minor.

Given that no known potable water wells are located on the Project site, no follow-up or monitoring is proposed to monitor environmental interactions with the groundwater, unless required under permit from NSECC.

7.1.3 Visual Environment

7.1.3.1 Shadow Flicker

Potential Interactions and Mitigation

The Proponent has conducted an operational visual impact assessment of a 2.0 km area surrounding the proposed turbine locations. Prior to this assessment, careful siting of the turbines has reduced the

majority of visual impacts to neighbouring residents by applying sufficient setbacks. The visual assessment included a shadow flicker study. The study was carried out assuming the largest turbine model under consideration for the Project to model a worst case scenario.

A total of 64 receptors were included in the shadow flicker assessment representing the 64 dwellings located within 2.0 km of a proposed turbine. This assessment was completed in alignment with the Guide to Preparing an EA Registration Document for Wind Power Projects in Nova Scotia and by modelling the turbine locations, turbine model, receptor locations and local topography using the Shadow module of the WindPRO software v3.5 .The shadow flicker levels at every receptor complies with the Guide to Preparing an EA Registration Document for Wind Power Projects in Nova Scotia. As such, the modelled shadow flicker emitted by the Project is less than the maximum of 30 hours per year and 30 minutes a day at any receptor. The maximum shadow flicker predicted was 10 hours and 13 minutes per year and 24 minutes per day based on the worst-case scenario shadow flicker assessment. The worst case scenario contemplates that the sun is not obstructed by any cloud cover and that the wind is blowing such that the blades are facing all 64 receptors during all daylight hours throughout the year. A detailed list of the assumptions made for this conservative assessment are detail in Appendix D.

As summarized in Appendix D, Natural Forces is confident that receptors will not receive excessive amounts of shadow flicker and will work closely with the homeowners and businesses to observe occurrences of real-case shadow flicker impact during operation and apply mitigation as mentioned.

The potential interactions of the Project on shadow flicker and the proposed mitigative measures are summarized in Table 34.

TABLE 34: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION FOR THE VISUAL ENVIRONMENT

Potential Interactions with Shadow Flicker	Proposed Mitigative Measures
Shadow flicker may occur during certain weather conditions and times of the year.	• The potential negative effect of shadow flicker has been largely mitigated at the design stage through responsible turbine siting; • A shadow flicker assessment has been completed for dwellings within 2.0 km of the proposed turbines; • Compliance with industry standard guidelines on shadow flicker has been achieved. All dwellings will experience less than 30 hours of shadow flicker per year and 30 minutes of shadow flicker on the worst day; • If shadow flicker occurrences during operation are found to be exceeding guidelines and annoying to surrounding houses and buildings, screening receptors may be considered as detailed in Appendix D; and • A Compliant Resolution Plan has been developed for residents to refer to if they have concerns about any shadow flicker observed during operation.

Significance of Residual Effects

During Project operation, shadow flicker concerns from local residents is expected to be limited due to the distance between the Project site and nearest potential receptor, which is approximately 1.6 km.

While any effect from shadow flicker could be negative, the significance of residual effects is anticipated to be minor due to such short amounts of shadow flicker expected at nearby receptors under worst-case scenario conditions. No cumulative effects are expected to occur with respect to shadow flicker and no further monitoring or modelling are recommended.

7.1.3.2 Visual Aesthetics

Potential Interactions and Mitigation

The Proponent has conducted an operational visual impact assessment of a 2.0 km area surrounding the proposed turbine locations. Prior to this assessment, careful siting of the turbines has reduced the majority of visual impacts to neighbouring residents by applying sufficient setbacks. The visual assessment includes a Zone of Visual Influence (ZVI) assessment and a photomontage. These studies were carried out assuming the largest turbine model under consideration for the Project to model a worst case scenario.

The Zone of Visual Influence study acts to determine the locations in the surrounding area where the Project will be visible and to what extent. The ZVI assessment considers the impact on the existing landscape and shows the expected number of turbines visible from a point. The mapping shows that while the turbines will be largely visible from much of the surrounding landscape, there are areas where the receptors have a lower number of turbines visible compared to the surrounding area according to the ZVI assessment. A map showing the results of this assessment are included in Appendix D.

The Photomontage study demonstrates how the Project will be visible on the landscape from a nearby location used by community members. The photomontage photo was taken from the Bent Ridge Winery. On the current photomontage of the 28-turbine layout, 21 turbines are visible from the selected location. This number includes turbines in full and partial view. The photomontage is included in Appendix D.

While the wind project is operational, lighting could be visible on top and mid-way up the turbine tower during the night. The lighting intensity and flashes will be minimized, as allowable by Transport Canada; and the exterior turbine maintenance lights will be turned off prior to maintenance staff leaving the site.

The potential interactions of the Project on shadow flicker and the proposed mitigative measures are summarized in Table 35.

TABLE 35: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION FOR VISUAL AESTHETICS

Potential Interactions with Visual Aesthetics	Proposed Mitigative Measures
While the wind project is operational, lighting could be visible on top and mid-way up the turbine tower during the night.	• LED lighting will be used to minimize light throw; • Only the minimum amount of pilot warning and obstruction avoidance lighting will be used; • Only lights with short flash durations and the ability to emit no light during the 'off phase' of the flash (i.e. as allowed by strobes and modern LED lights) will be installed on turbine structures;

Potential Interactions with Visual Aesthetics	Proposed Mitigative Measures
	• Lights will operate at the minimum intensity and minimum number of flashes per minute (longest duration between flashes) allowable by Transport Canada; and • Exterior turbine maintenance lights will be turned off prior to maintenance staff leaving the site.
During the construction period, lighting required during construction activities in the dark could temporarily alter the night-time visual landscape.	• Construction activities will be limited to the day time when possible. It is noted that the turbine may be erected during the evening as the activity must be completed when the wind is less than 8 m/s as a safety measure. These conditions are commonly seen in the early evening.
Community members may have a negative reaction towards the aesthetics of the wind turbines during operation.	• The Proponent considered landscape aesthetics when deciding on specific siting of the turbines; • The paint on the turbines will be selected such that it does not contrast sharply with the environment and minimizes blade glint; and • Policies regarding responsible siting of wind turbines were followed to minimize the potential impact on the landscape aesthetics during siting.

Significance of Residual Effects

The potential for impacts during project construction from work lighting, if necessary, will be temporary and of short duration. Impacts to the visual landscape during the construction phase are not anticipated.

During Project operation, lighting concerns from local residents is expected to be limited due to the distance between the project site and nearest potential receptor, which is approximately 1.6 km.

The perception of landscape aesthetics is a subjective matter. The Proponent recognizes the development of the proposed wind turbines may have a negative effect within the perception of the community however through siting and construction materials has mitigated the potential impact to the visual landscape as much as is feasible.

While any effect on the visual aesthetics of the land could be negative, the significance of residual effects is anticipated to be minor. No cumulative effects are expected to occur with respect to visual aesthetics and no further monitoring or modelling are recommended.

7.2 Biophysical VECs

7.2.1 Terrestrial Environment

7.2.1.1 Vegetation

Potential Interactions and Mitigation

Protecting vegetation and plant biodiversity is an important and integral aspect of maintaining a diverse ecosystem. In an effort to preserve local flora species and to ensure flora species of conservation

concern remain unharmed, vegetation has been identified as a VEC. The Project's impact on vegetation is predicted to be minor in terms of significance of environmental effect. A significant environmental effect would result if a considerable change to vegetation was the result of Project activities.

The proposed Project is located within the South Mountain Ecodistrict, which is generally dominated by Acadian forest tree species. The majority of the site is covered by Spruce Hemlock Pine Hummocks and Hills in locations with well drained soils and Red and Black Spruce Hummocks in areas with wet imperfectly drained soils (NSDLF 2019).

Information collected during field surveys has covered all habitat types. Habitat types are outlined in **Section 6.**2.1. One SAR and four SoCC lichens were identified in the Terrestrial LAA. As a result of the field survey findings, the PDA was modified so that no clearing within 100 m of the identified SAR lichen will occur, as recommended by NSDRR (NSDRR 2018).

It is unlikely that the identified SAR and SoCC species will be directly disturbed due to their locations with respect to the PDA. However, if additional species are located, a buffer an appropriate setback will be applied surrounding the plant of SoCC or SAR. The setback distance will be determined based on the species habitat requirements and applicable guidance under the SARA and NSESA.

There will be some loss of vegetation for the construction of turbines and the upgrading, widening and construction of access roads but any areas of disturbance not required for the operations of the Project will be revegetated upon site clean-up.

The potential interactions of the Project on vegetation and the proposed mitigative measures are summarized in Table 36.

TABLE 36: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION FOR VEGETATION

Potential Interactions with Vegetation	Proposed Mitigative Measures
Earth works (clearing and grubbing) will result in the disturbance of vegetation and habitat during construction and reclamation.	• Proper vegetation management measures following the Environmental Management and Protection Plan (Appendix O) will be instated; • Through the site selection process, the Project footprint has been sited predominantly in areas previously disturbed via clear cutting through forestry activities, creating a highly fragmented habitat and the project footprint is limited, to the extent possible, in areas of undisturbed habitat; • The area to be disturbed by the Project will be minimized to the extent possible (i.e., limited to the area that is required to accomplish the Project objectives); • Following the construction and decommissioning phases of the Project, natural revegetation of the site will be promoted; • There will be minimal land/habitat loss attributable to the construction phase as determined by desktop and field studies; • The access roads have been optimized to make use of existing roads at the Project site to reduce the amount of flora to be cleared; and,

Potential Interactions with Vegetation	Proposed Mitigative Measures
	• Areas of disturbance will be revegetated at the earliest opportunity.
There is a risk of introducing invasive species through plant matter attached to construction equipment.	• Heavy equipment will be properly cleaned and visually inspected prior to mobilizing to site to avoid potential introduction of exotic and invasive species.
Project activities have the potential to impact rare plants from direct disturbance if they are present in the Project site.	• Vegetation control measures during the operational phase will be minimized to the extent possible; • Efforts will be made to maintain mature vegetation along the edges of the development area, particularly in riparian areas; and • During Project activities, should a new SAR/SOCC be identified, a buffer will be maintained and additional mitigation will be developed in consultation with applicable regulatory authorities.

Significance of Residual Effects

The Project will be developed in such a way as to minimize the area of disturbance within the Project site and natural revegetation of the site will be promoted at the earliest opportunity. The majority of the area of disturbance is in the regeneration phase due to previous site activities, including forestry, which are unrelated to the Project.

Given current knowledge as informed by the desktop assessment, biophysical assessments, and previous site activities, significant potential impacts to vegetation communities is not anticipated as a direct result of the Project with the appropriate implementation of the mitigation measures presented.

Project siting has minimized the flora footprint from the access roads, crane pads, turbine foundation and substation by making use of existing infrastructure and disturbed areas. While the construction phase presents potential for negative impact, land that has been cleared and is not needed for operation will be encouraged to naturally regenerate. Additionally, once the decommissioning phase occurs, land reclamation will restore the Project site to its previous state. With the proposed mitigation measures employed, the significance of residual effects on flora is predicted to be minor and further monitoring or biophysical assessments are not recommended.

7.2.1.2 Wildlife

Potential Interactions and Mitigation

In an effort to preserve wildlife habitat and ensure wildlife species remain unharmed, terrestrial wildlife has been identified as a VEC. The Project's impact on terrestrial wildlife (excluding birds and bats, which are evaluated in the sections below) is predicted to be negligible in terms of significance of environmental effect. A significant environmental effect would result if a considerable change to wildlife populations was a result of project activities.

The proposed Project is located within an area that has been extensively used for forestry practices. The PDA was selected to incorporate previously harvested areas (clear-cuts or strip-cuts) that are now in different stages of natural regeneration and avoid (to the extent possible) undisturbed forest habitat. Information collected during field surveys on the presence or potential presence of terrestrial wildlife is presented in **Section 6.2.**1.2. The encountered wildlife species at the Project site have populations in Nova Scotia that are considered secure according to the ACCDC (2021) with the exception of one fisher (i.e., a SoCC ranked S3/Vulnerable by the ACCDC) which was observed during the spring while crossing one of the site access roads. In addition, and as discussed in Section 6.2.5, potential habitat exists within the terrestrial LAA for two SAR species which have been historically observed and recorded within the ACCDC database within 10 km of the PDA (i.e., Eastern Painted Turtle and mainland moose).

Fishers can be found in mixed forests throughout Nova Scotia with a preference for forests with large areas of continuous overhead cover and suitable denning sites (e.g., hollow trees, brush and rock piles) (Sabean 1989). Suitable habitat is available within the site, however, the proposed Project layout was designed to minimize the alteration of forest habitats. As a result of careful Project planning, along with the mitigation measures presented, a significant environmental effect on Fishers as a result of project activities is considered to be negligible.

Although targeted surveys were undertaken and no turtles were discovered, potential habitat within the terrestrial LAA for Eastern Painted Turtles is present within wetlands and waterbodies with slow moving, relatively shallow and abundant vegetation, as well as basking sites (COSEWIC 2018). As previously discussed, the proposed Project layout was designed to minimize interactions with wetlands and water bodies. The locations of the WTGs are not within 30 m of wetlands or waterbodies, therefore, potential project impacts during the operational phase of the Project is considered to be negligible. Potential interactions with suitable Eastern Painted Turtle habitat during the construction and site restoration project phases are possible. The potential for a significant environmental effect on Eastern Painted Turtles as a result of project activities is considered to be negligible following the mitigation measures presented in Table 37, along with mitigations measures to protect wetland habitat (presented below in **Section 7.2.1.3**).

Mainland Moose have the potential to be present within the Terrestrial LAA, as they can reside in a variety of forest habitats. The potential for interactions with Mainland Moose is unlikely within the PDA because moose require an abundance of mature forest for security and thermal cover, (NSDNRR 2021) and the PDA is located mainly within fragmented and previously forested landscape. The potential for a significant environmental effect on Mainland Moose as a result of project activities is considered to be negligible; however, if a moose is observed during any phase of the Project, mitigation measures presented in Table 37 will be followed.

Overall, the Project will decrease some wildlife habitat from the access roads and crane pads. While the construction phase presents potential for negative impact, once the decommissioning phase has started, land reclamation will restore the Project site to its previous state.

The potential interactions of the Project on wildlife and the proposed mitigative measures are summarized in Table 37.

TABLE 37: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION FOR WILDLIFE

Potential Interactions with Wildlife	Proposed Mitigative Measures
Temporary disturbance of foraging fauna and loss of breeding and foraging habitat during Project activities due to increased human presence, noise and Project footprint.	• Proper wildlife interaction measures following the Environmental Management and Protection Plan (Appendix O) will be instated • Vegetation will be retained where possible to maintain wildlife habitat; • The Project footprint will be limited to that which is necessary to enable the Project to be carried out; • Existing roads and trails will be utilized to limit disturbance outside the Project footprint and minimize the interactions with wildlife and wildlife habitat; • To minimize wildlife encounters, the site and working areas will be kept clean of food scraps, and garbage will be removed from the site daily and traffic will be limited to roadways; • In the case of wildlife encounters, the following will be implemented: (1) no attempt will be made by any worker at the Project site to chase, catch, divert, follow or otherwise harass wildlife by vehicle or on foot; (2) equipment and vehicles will yield the right-of-way to wildlife; and (3) if a SAR or a nest of any bird is encountered during activities, work around the SAR or nest shall cease until a biologist is dispatched to assess the situation and appropriate mitigation is applied; • To minimize disruptions with wildlife activity at night, the Project construction activities will be limited to daylight hours when possible; and • All workers will adhere to the provincial Nova Scotia Endangered Species Act and federal Species at Risk Acts.

Significance of Residual Effects

The effects of the Project activities on wildlife are expected to be limited to the Project footprint that is required to meet Project objectives. Disturbance of fauna habitat as a result of this Project will be minimized by employing the proposed mitigation measures. With the proposed mitigation, the residual interactions of the Project with fauna species are anticipated to be short in duration are not anticipated to be substantive because they are limited to the construction and reclamation phases and are occurring already in highly fragmented habitat that has ongoing forestry activities.

7.2.1.3 Wetlands

Potential Interactions and Mitigation

Wetlands were assessed as part of the Terrestrial Environment VEC because they may perform many important functions and services in landscapes (e.g., improving water quality, controlling floods, providing critical habitat for rare and endangered species, and many others). In addition to performing important landscape functions, wetland ecosystems are typically some of the most productive

ecosystems encountered in Nova Scotia. As such, in Nova Scotia (and elsewhere), many VECs (e.g., SAR and SoCC, birds, as well as culturally significant flora) are hosted within wetland ecosystems. The Project's impact on wetlands is predicted to be minor in terms of significance of environmental effect. A significant environmental effect would result if a considerable change to wetlands or wetland functions was the result of project activities. As previously discussed, the proposed Project layout was designed to minimize interactions with wetlands. The locations of the WTGs are not within 30 m of wetlands, therefore, potential project impacts during the operational phase of the Project is considered to be minor. A change in wetland size or function could occur during the construction for access roads or site restoration in the areas of the wetlands may require clearing. This could alter the vegetation, increase erosion rates or alter natural drainage patterns in proximity to the aquatic receptors. Loss of wetland area or function (i.e., hydrological regime, habitat and water quality maintenance) could occur due to clearing of trees and vegetation within the wetlands.

Information gathered on wetlands within the Terrestrial LAA during the preliminary wetland assessment is outlined in **Section 6.2.1**.3. Over 100 wetlands (totaling approximately 286 ha of land) were assessed within the LAA, comprising of treed and shrub swamps with lesser areas of bogs and fens. Approximately 94 of the identified wetlands, primarily swamps, within the LAA are located adjacent to existing roads (i.e., within 30 m) and would likely already be seeing some level of impacts from the ongoing forestry activities onsite. Of the >280 ha wetlands identified within the LAA, only 32 ha are located within the PDA, noting that the proposed turbine locations are not located within 30 m of wetlands.

Prior to the construction phase of the Project, a functional assessment of wetlands within or downstream of the PDA that may be impacted will be conducted. The functional assessment will provide valuable baseline information for wetland monitoring should it be required following the avoidance of wetlands through the Project planning and the mitigation measures laid out in Table 38.

The potential interactions of the Project on wetlands and the proposed mitigative measures are summarized in Table 38.

TABLE 38: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION FOR WETLANDS

Potential Interactions with Wetlands	Proposed Mitigative Measures
During the construction phase, Project activities, such as clearing, grubbing, infilling, and excavation, have the potential to impact wetlands. Such activities might induce silt run-off, alter flow into the wetlands or see them become repositories of significantly increased water flow, nutrients or sediments.	• Wetlands within the PDA will be functionally assessed and delineated prior to disturbance; • Avoiding work within wetlands with current setbacks of 30 m from wetlands for WTGs where possible; • Where avoidance is not possible, disturbances will be minimize as much as feasible (i.e., limited to the area which is required to accomplish the Project objectives); • A wetland alteration permit will be obtained for work in any wetland, noting that work within wetlands will be avoided or minimized to the extent possible during the Project design phase;

Potential Interactions with Wetlands	Proposed Mitigative Measures
	• Appropriate sediment erosion and run-off control measures (e.g. silt fencing, hay bales) will be implemented as required; • Natural regeneration of the site will be promoted to aid in storm water retention and reduce run-off; • No stockpiling of materials will occur within 30 m of a wetland; • Vehicle traffic in the wetlands will be minimized by using alternate techniques (e.g. hand cutting vegetation) where possible; • Mats and other means to avoid disruption of the wetlands will be used during necessary tree clearing; • Wetland within the PDA of collector or transmission lines will be spanned with electrical poles; • Refueling equipment won't happen within 30 m of a wetland; • Avoiding contamination in wetlands by making sure equipment is routinely inspected for leaks; • Spill response kits will be in each piece of equipment; and • Proper wetland protection and erosion and sediment control measures following the Environmental Management and Protection Plan (Appendix O) will be installed and checked regularly during the construction phase and prior to, and after, storm events to ensure they are continuing to operate properly to minimize potential effects to adjacent habitat.

Significance of Residual Effects

The Project will be developed in such a way as to avoid wetlands, minimize disturbance to the wetlands where avoidance is not possible and minimize the area of disturbance within the Project site. As well, natural revegetation of the site will be promoted at the earliest opportunity. Avoidance through site design has been completed to the extent possible, (i.e., spanning wetlands using overhead collection lines, use of existing roads, and avoiding wetlands where possible). Given current knowledge as informed by the desktop assessment, biophysical assessments, and previous site activities, significant potential impacts to wetlands is not anticipated as a direct result of the Project with the appropriate implementation of the mitigation measures presented. Wetland monitoring during the construction phase for wetlands within the PDA will be carried out as required by NSECC. Due to locations of wetlands in proximity to site infrastructure, as well as avoidance of impact to wetlands with infrastructure no further monitoring will be conducted during operations.

7.2.2 Birds and Bird Habitat

Potential Interactions and Mitigation

Birds and their habitats have been identified as one of the biophysical VECs. Throughout the construction, operation, and decommissioning of the Project, the potential negative impacts on birds can be classified into four categories: collision, displacement due to disturbance, barrier effects, and habitat loss. As a result, birds have been identified as a VEC. The Project's impact on birds, overall, is predicted to be minor in terms of significance of environmental effect. A significant environmental effect would result if a considerable change to migratory and breeding birds was the result of project activities.

During the 2021 bird field surveys, over 7,000 individual birds of over 90 different species were recorded within the local assessment area. In addition, radar and acoustic monitoring confirmed that migration was focused on a few nights during the season when tailwinds were light to moderate. Information on the existing state of birds and bird habitat based on information gathered and data collected during field surveys, as well as radar and acoustic monitoring is outlined in **Section** 6.2.2.Specifically, eight SAR and 20 SoCC birds were observed during the birds surveys. The SAR birds observed in 2021 within the bird LAA are summarized below, more information in bird SAR and SoCC is further detailed in Sections 6.2.2 and 6.2.5.

- Potential breeding Canada Warbler were mainly observed during the spring and summer surveys within the bird LAA. Suitable nesting habitat, such as wet mixed forests with well-developed shrub layers, as well as regenerating areas is widly available within the LAA.
- Chimney Swift was detected within the Project site in 2021 and is likely to use the site for foraging purposes. Most observations of Chimney Swift were reported during the fall migration, however, one bird was observed during a summer breeding survey. Chimney Swifts are aerial foragers and tend to concentrate near water where insects are abundant. Chimney Swift have adopted chimneys as preferred nesting sites and suitable nesting habitat for chimney swifts was not observed in the PDA.
- Common Nighthawks were detected mainly during the summer surveys within the Project site. They typically nest on the ground in open or sparsely vegetated habitats and suitable nesting habitat does exist within the LAA for birds.
- Eastern Wood-Pewee (Contopus virens). This species was detected within the Project site in 2021 and is likely to use the site for foraging and nesting purposes The Eastern wood-pewee breeds in open woodlands with a dominance of deciduous trees and typically forages on flying insects in the middle canopies of forests. Due to existing site disturbance, suitable habitat for Eastern Wood Peewee within the PDA is very limited but exists mainly within the non-forested land within the PDA
- Evening Grosbeaks were identified during the 2021 late-winter, spring summer and fall bird surveys. Suitable breeding habitat for Evening Grosbeaks within the PDA is very limited but exists mainly within the non-forested land within the PDA
- Olive-sided Flycatchers were detected within the Project site and suitable nesting habitat, such as open, forested areas, often with many conspicuous perches does exist within the bird LAA. Most observations of olive-sided flycatchers were reported during the spring and summer surveys;

however a few observations were noted early during the fall migratory period (late August) at locations that spanned the site and multiple habitat types.

- Two Peregrine Falcons were observed at the Project site during the fall migratory surveys. Although this species was not detected during the breeding season, there are numerous bedrock outcroppings that could provide potential nesting habitat for Peregrine Falcons.
- During the 2021 bird surveys, 2 Rusty Blackbirds were detected during the spring migration window in wetlands. Rusty Blackbirds nest in conifer-dominated forests, wetlands, bogs and wet meadows. This species may occur within the Project site as suitable nesting habitat does exist.

During the construction and decommissioning phases interactions are possible as a result of disturbance caused by noise and the loss of habitat within the Project footprint. The Project layout was designed to minimize the disruption to terrestrial habitats. In addition, mitigation measures outlines in Table 39 with minimize the disturbance to birds and loss of bird habitat during the construction and decommissioning phases.

During operation there is a possibility that migrating birds could collide with the wind turbines and Project infrastructure. In addition, birds may alter their migration flyways and/or local flight paths to avoid wind turbines. The data from the radar and acoustic monitoring suggest that while the proposed turbines for the Project are taller than previous generations of turbines constructed in Nova Scotia, the majority of migration will be above the rotor sweep area (RSA). Although the predicted mortality rate of birds due to collision and/or habitat loss cannot be accurately predicted prior to the operational phase, technology and more robust biophysical assessments have improved understanding of the potential interactions between wind projects and wildlife. Further mitigation measures and monitoring, as outlined in Table 39, will minimize the effects of the project on birds.

The potential interactions of the Project with birds and bird habitat and the proposed mitigative measures are summarized in Table 39.

TABLE 39: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION FOR BIRDS AND BIRD HABITAT

Potential Interactions with Birds and Bird Habitat	Proposed Mitigative Measures
During construction vegetation might be cleared and areas disturbed that may be habitat to migratory and breeding birds.	• Desktop and field studies conducted suggest a minimal loss of bird habitat due to clearing. The clearing footprint is minimized by using existing access roads and areas previously cleared from forestry activities; • The Proponent will endeavor to conduct construction activities such as clearing and grubbing during a time period that does not coincide with the time period in which migratory and breeding birds would be in the area; • Should clearing and grubbing be required during the region's breeding bird season, the Project area will be visually checked on a daily basis for nesting migratory birds. Should a nesting migratory bird be identified within the work area, ECCC/Canadian Wildlife Service (CWS) will be notified and an

Potential Interactions with Birds and Bird Habitat	Proposed Mitigative Measures
	appropriate no-work buffer zone (in consultation with ECCC/CWS) will be applied around the nest until the nest has been fledged. No flagging of the nest will occur to minimize chances of predation; • Stockpiling of fill and excavated materials will be minimized to deter the potential for nesting by bank swallows or other ground nesting species (e.g., common nighthawk). Fill/excavation material piles will be at low angles, if left standing for long durations; • All workers will adhere to the Migratory Birds Convention Act, 1994 and the Migratory Birds Regulations; and • All workers will adhere to the provincial Nova Scotia Endangered Species Act and federal Species at Risk Acts.
Construction lighting may alter the behavior of birds.	• To minimize disruptions with wildlife activity at night, the Project construction activities will be limited to daylight hours when possible; • Necessary construction lighting will be pointed downwards; and, • Instruction will be given to maintenance staff to ensure all work lights are turned off upon leaving the site particularly during foul weather events.
During operation there is a possibility that migrating birds could collide with the wind turbines and Project infrastructure.	• A follow up avian mortality survey will be planned and conducted in consultation with NR&R and CWS after the Project commissioning. • Should unexpected negative impact to migration flyways occur, appropriate actions will be taken in consultation with CWS and NR&R; • Non-operational towers shall be dismantled if not expected to be put back into operation; and • A comprehensive Adaptive Management Plan will be developed and implemented in consultation with CWS and NR&R.
Birds may alter their migration flyways and/or local flight paths to avoid wind turbines.	• A follow up avian mortality survey will be conducted after the Project commissioning and appropriate actions will be taken in consultation with CWS and NR&R.
Lighting on turbines can result in adverse impacts on birds. The Proponent recognizes that nocturnal migrant and night-flying seabirds are the birds most at risk of attraction to lights.	• Lighting requirements will meet ECCC standards to minimize the potential impacts to migratory birds; • Only the minimum amount of pilot warning and obstruction avoidance lighting will be used; • Only lights with short flash durations and the ability to emit no light during the 'off phase' of the flash (i.e. as allowed by strobes and modern LED lights) will be installed on tall structures; • Lights will operate at the minimum intensity and minimum number of flashes per minute (longest

Potential Interactions with Birds and Bird Habitat	Proposed Mitigative Measures
	duration between flashes) allowable by Transport Canada; • Instruction will be given to wind farm maintenance staff to ensure all work lights are turned off upon leaving the site particularly during foul weather events; and • A follow up avian mortality survey will be conducted after the wind farm commissioning, and appropriate actions will be taken in consultation with CWS and NR&R.
Fog events can impair avian visibility, increasing the likelihood of mortality from collision with wind turbines.	• Instructions will be given to wind farm maintenance staff to ensure all work lights are turned off upon leaving the site particularly during foul weather events.

Significance of Residual Effects

The predicted mortality rate of birds due to collision and/or habitat loss cannot be accurately predicted prior to the operation of the Project, however, it is expected that the mortality rate of birds from collision or habitat loss during Project operation, if at all, will be low. Mabee et al. (2006) reported that migration altitudes averaged 410 m a.g.l within the ground to 1.5 km altitude range, and nightly averages ranged from 214 to 769 m. It is important to note that the percent of targets detected in that study was relatively uniform between 0 and 500 m a.g.l., which would indicate that there isn't a greater risk of avian collision if turbine heights were increased to 200 m.

Horton (2016) indicates average heights of birds flight paths during migration recorded from multiple studies ranged between 119.8 m and 1135.6 m. As these are averages, night migrants were found both above and below these levels suggesting current wind energy facilities are already within this migration corridor and thus, using turbines with a maximum height range of 200 m does not pose a new risk. Erickson et al. (2014) indicated that bird mortality at wind energy facilities in North America account for at most 0.043 % of the population estimates for the species most affected by collision mortality; turbine collision mortality accounted for a lower rate than this for all other species and does not pose a threat to populations.

The avian nocturnal migration survey found that, while some level of migration was observed on most nights, a large proportion of the migratory activity observed in each season was only limited to only a few nights. When examining nights when large numbers of targets were detected (i.e., when most of the migration occurred) the bulk of the migratory movements were detected at around 500 m altitude and there tended to be fewer of targets at lower altitudes (i.e., within the Rotor Sweep Area [RSA]).

The Proponent does not anticipate significant mortality rates for the proposed turbines at a maximum height of 200 m. The recommended post-construction monitoring for bird mortality during operation will verify the impact the Project has on migratory and breeding birds. With the proposed mitigation measures employed, the significance of residual effects on migratory and breeding birds is predicted to be minor. Should the post-construction surveys indicate something different,

the Proponent will follow the Adaptive Management Plan and engage regulatory authorities in applying additional mitigative measures.

7.2.3 Bats and Bat Habitat

Potential Interactions and Mitigation

Throughout all phases of the Project, the potential impacts on bats can be classified into two categories: collision and habitat disturbance.

The predicted mortality rate of bats due to collision and/or habitat loss cannot be accurately predicted at the time of EA registration. However, industry standards, technology and more robust biophysical assessments have improved understanding of the potential interactions between wind projects and wildlife.

Bat activity was surveyed in the field using acoustic bat monitors, as discussed above in **Section 6.2.**3. The average total bat passes and migratory bat passes per detector night for the breeding period spanning June 1 through July 31 and a fall migration period of August 1 through October 15, equates to 0.08 to 0.03 bat passes, and 0.25 to 0.08 bat passes, respectively. Based on Dillon's experience on similar bat acoustic programs throughout the country, both the total number of bat passes and the average bat passes per detector night (during the breeding period, fall migration, and entire survey period) are considered very low.

The potential interactions between bats and bat habitat with the project include the loss of habitat, or displacement from surrounding habitat, due to construction activities; fatalities due to collisions with turbine towers or blades or the transmission line infrastructure during operation; and modifications to existing flight paths as bats avoid the project area or are attracted to the area by tower lights. The potential interactions of the Project on bats and bat habitat and the proposed mitigative measures are summarized in Table 40.

TABLE 40: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION FOR BATS AND BAT HABITAT

Potential Interactions with Bats and Bat Habitat	Proposed Mitigative Measures
Clearing and construction activities have the potential to cause disturbance to bat habitat.	• The Project site has been designed to minimize the amount of land cleared. This reduces the ecological impact of the Project Footprint and minimizes the potential impact to bat habitat; and, • The area of disturbance will be vegetated as soon as feasible.
During operation there is a possibility that bats could collide with the wind turbines or succumb to barrotrauma.	• A follow up bat mortality survey will be conducted after the Project commissioning and appropriate actions will be taken in consultation with the appropriate authorities should there be a significant negative impact to bats; • Non-operational towers shall be dismantled if not expected to be put back into operation; and • A comprehensive Adaptive Management Plan will be developed and implemented in consultation with CWS and NR&R.

Significance of Residual Effects

Disturbance of bat habitat during construction has the potential to occur, however due to the low number of bat passes recorded at the Project site, limited predicted impacts to the habitat, and with the implementation of planned mitigation and careful development and implementation of contingency and emergency response plans, it is anticipated that effects related to the Project will not be substantive. Should follow up surveys indicate something different, the Proponent will engage regulatory authorities in applying additional mitigative measures.

Post-construction monitoring for bat mortality during operation will also verify the effect the Project has on bats. Should a significant amount of bat mortality be observed following the post construction surveys, the Proponent will follow the Adaptive Management Plan and engage regulatory authorities in applying additional mitigative measures.

7.2.4 Aquatic Environment

7.2.4.1 Fish and Fish Habitat

Potential Interactions and Mitigation

Water crossings of watercourses that have suitable fish habitat exist within the PDA and were included at VECs. The PDA was selected to minimize interactions with watercourse crossings by avoiding development in locations with watercourses to the extent possible. As a result of careful Project planning, the locations of the WTGs are not within 30 m of watercourses, however, 23 watercourses were identified within 50 m of existing forestry roads to be upgraded or proposed new access roads, including 13 that are considered likely to be fish-bearing. The Project's impact on fish and fish habitat, overall, is predicted to be minor in terms of significance of environmental effect. A significant environmental effect would result if a considerable change to fish and fish habitat was the result of project activities.

Potential temporary interactions with fish and fish habitat may occur from physical alterations of the aquatic environment (i.e. watercourse crossings) during the construction phase. Interaction may primarily occur during clearing and grubbing and access road widening, as well as during eventual infrastructure removal and site reclamation activities in the decommissioning phase. The mitigation measures, outlines in Table 41, will minimize the potential for runoff from the Project areas to reach fish-bearing watercourses.

The proposed Project is situated within the Avon River secondary watershed named watercourses within or downstream of the PDA include the Mint River, Levy Meadow Brook, and Five Island Brook. Lakes in the vicinity of the Project Area include Five Island Lake, Bennett Lake, Duck Ponds, Pine Lake, and Splash Dam Lake. According to Department of Fisheries and Oceans (DFO) SAR mapping review, Atlantic salmon, Inner Bay of Fundy population (Salmo salar) are identified throughout the Avon River watershed (DFO, 2021). Although suitable Atlantic salmon habitat was not identified during initial field studies, watercourses that may be impacted by the final design will undergo additional detailed assessments to ensure that potential impacts to the species are considered and appropriately mitigated.

Information and data collected during field surveys on potential fish-bearing watercourses is presented in **Section 6.2**.4.

The potential interactions of the Project on fish and fish habitat and the proposed mitigative measures are summarized in Table 41.

TABLE 41: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION FOR FISH AND FISH HABITAT

Potential Interactions with Fish and Fish Habitat	Proposed Mitigative Measures
Loss or damage to fish and fish habitat during watercourse alteration and erosion.	• Limit the removal of riparian zone vegetation; • Minimize the use of heavy equipment within 30 m of a watercourse; • All construction activities near watercourses will comply with the applicable regulations and guidelines such as the *Fisheries Act* and will be carried out strictly in accordance with NSECC and DFO Approvals, Terms and Conditions, and Letters of Advice; • Any necessary watercourse crossings will be located in areas that exhibit a stable soil type where grades approaching the crossings will not be too steep, and will span the watercourse where possible; • Proper erosion and sediment control measures will be installed and checked regularly during the construction phase and prior to, and after, storm events to ensure they are continuing to operate properly to minimize potential effects to adjacent habitat; • Sufficient staff and equipment to manage erosion and sediment control during storm events and other emergencies; • In stream work will be timed to occur in the dry season and not during significant rainfall Culverts will be designed and installed to prevent the creation of barriers to fish movement and maintain bankfull channel functions and habitat functions to the extent possible; and • Runoff shall be controlled, and sediment will be prevented from leaving the Site at all times; and • Visual monitoring of silt or sedimentation within watercourses will occur during construction after heavy weather events.

Significance of Residual Effects

Interactions between the Project and the aquatic environment are expected to be primarily related to the operation of heavy mobile equipment and vehicles as well as the transport of materials on- and off-site. These construction activities may require the installation of watercourse crossings or widening of existing crossings which could impact fish and their ability to use and/or access upstream habitat. Sediment laden runoff from the Project can harm fish and damage their habitat by entering watercourses that flow through the Project site. By limiting the timing of soil disturbance activities to avoid high precipitation events, working within the dry season, and installing sediment control

measures, these interactions will be limited and controlled. With the implementation of these mitigation measures, interactions between the Project and the fish and fish habitat are not anticipated to be substantive and no follow-up or monitoring is recommended unless required under permit from NSECC or DFO.

7.2.5 Species at Risk

Potential Interactions and Mitigation

The proposed Project is located in a primarily forested area that has the potential to provide habitat for some SAR and SoCC. The Proponent is committed to protecting SAR, SoCC and their habitat as important features and VECs related to the proposed Project. A significant effect would include the loss of SAR, SoCC and their habitats.

SAR and SoCC either confirmed or that have the potential to be present within the PDA are listed in **Section 6.2.**5. A buffer of 100 m has been applied to a SAR lichen species identified within the PDA. Although the site provides suitable habitat for several SAR fauna species, no critical habitat SAR was identified within the PDA.

Surveys for birds and bats were conducted in 2021 and confirmed the presence of SAR and SoCC birds and SAR bats within the assessed area. These potential interactions and mitigation for birds and bats through the operational phase of the project are discussed in Sections 7.3.3 and 7.3.5, respectively.

The Project layout was designed to avoid plant SAR and additional mitigation protecting other VECs would also protect SAR. The potential interactions of the Project on species at risk and the proposed mitigative measures are summarized in Table 42.

TABLE 42: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION FOR SPECIES AT RISK

Potential Interactions with Species at Risk	Proposed Mitigative Measures
Project activities have the potential to impact SAR from direct disturbance if they are present in the Project site.	• During Project activities, should a SAR/SOCC be identified, a buffer will be maintained and additional mitigation will be developed in consultation with applicable regulatory authorities specific to the SAR/SOCC species identified; and • Proper wildlife interaction measures following the Environmental Management and Protection Plan (Appendix O) will be instated.

Significance of Residual Effects

The effects of the Project activities on species at risk are expected to be limited to the Project footprint that is required to meet Project objectives. Disturbance of flora and terrestrial fauna (excluding birds and bats) species at risk and their potential habitat as a result of this Project will be avoided or minimized by employing the proposed mitigation measures. With the proposed mitigation, the residual interactions of the Project with species at risk are anticipated to be short in duration are not anticipated to be substantive because they are limited to the construction and reclamation phases.

Residual effects of the Project during the operational phase are possible for Bird and bat species at risk, especially migratory species. The Proponent does not anticipate significant mortality rates for the proposed turbines at a maximum height of 200 m. The recommended post-construction monitoring for bird and bat mortality during operation will verify the impact the Project has on these species. With the proposed mitigation measures employed, the significance of residual effects on bird and bat SAR is predicted to be minor. Should the post-construction surveys indicate something different, the Proponent will follow the Adaptive Management Plan and engage regulatory authorities in applying additional mitigative measures.

7.3 Socioeconomic VEC

7.3.1 Economy

Potential Interactions and Mitigation

The Project is expected to provide jobs to the local community through the use of accommodations and services during onsite work and through local hiring of contractors. This is expected to be beneficial for the area. Additionally, the Project will produce economic benefits to the municipality through the payment of property taxes. The installation of the Project may also provide tourism benefits for the area as people may come through to view the Project.

As the Proponent is committed to utilizing the local labor force where possible, the Project is not anticipated to add strain to the community services already in place.

The potential interactions of the Project on the economy and the proposed mitigative measures are summarized in Table 43.

TABLE 43: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION FOR THE ECONOMY

Potential Interactions with the Economy	Proposed Mitigative Measures
The Project will provide employment opportunities to the local community during construction, operation, and decommissioning phases.	• Where possible the local workforce will be sourced to fill the employment opportunities.
The Project will provide economic development opportunities for the Mi'kmaq, local communities, West Hants Regional Municipality, and Nova Scotia.	• The proposed Project will support community economic development through hiring local consultants and contractors, when possible, the use of local services such as accommodations, restaurants and fuels, and will be required to pay municipal taxes; • The proposed Project will support a stable long term revenue source to the 13 Mi'kmaq bands in Nova Scotia; and • Community economic development is a positive impact: no mitigation is required.

Significance of Residual Effects

The Proponent will, when appropriate, make every effort to utilize local services and products, which is in line with the Proponents' ideology of community-based projects. The predicted effects of this Project

on the local economy are positive and as a result of the municipal taxes and economic spinoff, the significance of residual effects on local economy is expected to be beneficial.

7.3.2 Land Use and Values

Potential Interactions and Mitigation

The Project is located in a fairly remote area of the West Hants Regional Municipality on a mix of privately-owned and provincial Crown land. The private land has been used for forestry and is, therefore, a disturbed area with a network of existing access roads. The land is currently used for some recreational purposes, such as hunting and snowmobiling. A wind project is considered a compatible use for these existing land uses.

A review of the available literature found that there were no correlating negative associations between wind farms and property value. In 2010 a study in the Municipality of Chatham-Kent, Ontario was prepared to assess the effects of wind energy on real estate values. This report was prepared in accordance with the Canadian Uniform Standards of Professional Appraisal *Practice* for the Appraisal Institute of Canada (Canning et al. 2010). The report is widely recognized in the wind industry as a thorough study and demonstrates what many other studies also indicate. The study found that it was highly unlikely that a relationship exists between wind farms and the market values of rural residential real estate (Canning et. al. 2010).

A study by the University of Guelph analyzed more than 7,000 home and farm sales that occurred between 2002 and 2010 in Melancthon Township, Ontario, which saw 133 turbines erected between 2005 and 2008. Of the 7,000 homes and farms, 1,000 were sold once, and some multiple times. Co-authors, Richard Vyn and Ryan McCullough conclude that the turbines in question have not impacted the value of the surrounding properties. Further, the nature of the results, which indicate a lack of significant effect, is similar across both rural residential properties and farm properties (Vyn McCullough 2014).

There is the potential that the turbine rotor may interfere with the transmission and receipt of telecommunication signals from radiocommunication towers. A Radiocommunication Impact Study has been completed to locate the communication towers in the area and assess the potential for the Project to impact them. Appropriate buffers have been applied to all radiocommunication towers and their signal corridors according to the Radio Advisory Board of Canada (RABC) guidelines.

There is no anticipated interference to the existing radiocommunication infrastructure and systems as a result of the Project as none of the turbines are sited within the consultation zones outlined by the Radio Advisory Board of Canada and the Canadian Wind Energy Association (RABC-CanWEA) (2020). The Radiocommunications System Impact Study in Appendix M demonstrates adherence to these standards.

Transport Canada and Navigation Canada have been consulted in regards to the Project. Aeronautical Obstruction Evaluations and Land Use Proposal Forms have been submitted for evaluation of the proposed location and have received approval. The Department of National Defence has also been notified about the proposed project and location and no objections have been received.

The potential interactions of the Project on land use and values and the proposed mitigative measures are summarized in Table 44.

TABLE 44: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION FOR LAND USE AND VALUES

Potential Interactions with Land Use and Values	Proposed Mitigative Measures
Temporary noise and/or light disruption from construction equipment.	• Local residents have been notified of the Project, including planned activities and planned schedule; • Adjacent residents will be re-notified immediately before the commencement of construction activities (i.e., when the contractor is retained and the schedule is finalized); and • Construction activities will be limited to daytime hours unless absolutely necessary.
Wind turbine operation may interfere with telecommunication and/or radar communication infrastructure	• Consultation was completed as recommended by the CanWEA and RABC's guidance document – Technical Information and Guidelines on the Assessment of the Potential Impact of Wind Turbines, on Radio Communications, Radar and Seismoacoustic Systems; • A desktop radiocommunication impact assessment was conducted by the Proponent in line with the RABC guidelines. The results of the assessment show that the turbine locations will not interfere with the telecommunication corridors of nearby towers; • Approval has been received from Navigation Canada, ensuring that the Project does not pose any hazard to the navigational systems; and • Transport Canada and Department of National Defence have also approved the Project location.
Land use of the project site where the turbine is proposed will change from clear-cut, fragmented habitat to a source of renewable energy.	• The land use changes are predicted to be positive: no mitigation is proposed.
Current land use may be impacted during the construction and operation of the Project.	• Consultation with all current land users is ongoing; • Ongoing consultation with the local snowmobile club has and will continue to occur to ensure safe recreational use of the Project lands; • When forestry activities are occurring onsite, extra caution will be taken on roads; and • The zoning for the Project is appropriate with surrounding land uses, so incompatible land uses are not expected to occur.
Public concern that property value may decrease as a result of the Project	• Real estate value studies have consistently determined no correlation between proximity to wind farms and property devaluation (Canning et. al. 2010); and • Education through public consultation can be effective in providing factual, relevant information to alleviate the concerns of local residents.

Significance of Residual Effects

Based on consultation with the appropriate authorities, no impedance on communication infrastructure is to be expected. As a result, the significance of residual effects on telecommunication and radar communication is expected to be negligible.

Consultation with direct and adjacent land users will continue on an ongoing basis to ensure safe and compatible use on the Project site.

The significance of residual effects on land use and property value is expected to be negligible.

7.3.3 Transportation

Potential Interactions and Mitigation

During construction of the access roads and turbine foundations, there will be an increase in truck traffic on the roads leading to and from the Project site. During delivery of the turbine components, delivery of oversized loads may slow traffic flow.

Oversized loads will be associated with the delivery of turbine towers, blades, nacelles, and the cranes required for erection and decommissioning. These deliveries are anticipated to be subject to movement orders as agreed upon with governing authorities.

The potential interactions of the Project on transportation and the proposed mitigative measures are summarized in Table 45.

TABLE 45: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION FOR TRANSPORTATION

Potential Interactions with Transportation	Proposed Mitigative Measures
Temporary traffic delays are possible during construction due to movement of equipment and materials to the Project site.	• Detour and other traffic control signs will be posted where necessary during construction to minimize traffic within the construction site; • Delivery of materials to site will be scheduled outside of peak traffic times, when possible; • Truck drivers will adhere to posted speed limits and warning signage and adjust driving to meet weather and road conditions; • All necessary permits will be obtained and industry best practices will be followed for special moves or traffic interruptions on public roads; • Any potential modifications to intersections for access to the Project Area will follow appropriate traffic controls and permitting; and • The construction schedule will be shared with nearby residents.

Significance of Residual Effects

The time frame in which an impact to traffic may occur will be temporary, and combined with the proposed mitigative measure of avoiding high traffic times; the significance of residual effects on vehicular traffic is expected to be negligible.

7.3.4 Human Health and Safety

Potential Interactions and Mitigation

Public health and safety are of great importance in the development of the Project. During all Project phases, the protection of worker and the public health and safety is protected under the provincial OHS (Occupational Health and Safety) Act.

Proper setbacks have reduced the risk to public health and safety from noise and shadow flicker impact, possible fires, ice throw and malfunction. Technological considerations, including a built-in system to detect ice on the blades, to reduced ice throw will be implemented. Further, a lightning protection system will conduct electrical surges away from the nacelle to prevent fires. This system includes wiring around and throughout the turbine to transport and dissipate the surge to the ground.

Consultation with applicable aviation authorities has occurred, and the turbine lighting will conform to Transport Canada requirements for aviation safety. Safe work practices will be encouraged onsite during the construction phase.

Over the past few years, there has been growing concern over public safety in relation to possible exposure to electromagnetic fields (EMFs) from wind turbines. Electric fields are generated by a difference in voltage while magnetic fields are generated when there is a flow of electric current. A higher voltage and greater the current will result in a larger EMFs (WHO, 2017).

EMFs can also occur naturally in the environment and are generated from every electrical distribution line that connects to homes and from all household electronic devices. A study conducted in 2014 (McCallum et al.) found that EMFs around wind turbines do not present a health concern to the public and that levels surrounding wind turbines are found to be lower than levels found around homes from use of common household electrical devices.

EMFs generated from wind turbines are not considered to pose health concerns and are not considered a potential impact to public health and safety.

Ice accumulation on wind turbine blades can occur during the winter months when the appropriate conditions of temperature and humidity exist, or during certain extreme weather conditions, such as freezing rain (Seifert et al., 2003). In the event that ice builds up on the wind turbine blades, there are two types of risks possible: the first is ice throw from an operating wind turbine, and the second is ice fall from a wind turbine that is not in operation.

Ice throw was investigated to determine the risk probability for an individual to be struck by ice thrown from an operating wind turbine The results of the statistical analysis by LeBlanc et al., 2007), as discussed further in Section 8.3, found that individual risk probability for an individual is incredibly low,

The potential interactions of the Project on human health and the proposed mitigative measures are summarized in Table 46.

TABLE 46: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION FOR HUMAN HEALTH.

Potential Interactions with Human Health	Proposed Mitigative Measures
During cold weather there is the potential for ice to build up on the turbine blades and be thrown.	• Turbines will be equipped with ice-detection systems on each blade; • Turbines will be designed to shut down in the case of ice-buildup and/or activate the de-icing system, if available; and • Signage will be posted on site to indicate the risk of ice throw to any land users and to require Personal Protection Equipment to be worn when near the turbines.
During extreme weather events, there is the potential for electrical fires within the turbine nacelle through lightning strikes.	• Turbines will be equipped with lightning protection that, in the unlikely event of a lightning strike, will dissipate the lightning current to the ground.
Potential aviation hazard to low flying aircraft.	• Approval has been received from Navigation Canada and Transport Canada for the turbine locations, ensuring that the Project does not pose any hazard to the navigational systems.
Increase in vehicular traffic may have the potential to affect public safety.	• Every effort will be made to ensure that oversized loads are delivered during times of lowest traffic to mitigate road traffic.; • Speed limit signs will be posted across the site and roads onsite will be maintained in good working order.
Shadow flicker may affect human health.	• This potential impact has been addressed in the Shadow Flicker Section 7.2.3.
Sound levels may affect human health.	• This potential impact has been addressed in Section 7.2.1.
Potential for accidents and malfunctions pose a risk to workers and the public's health and safety.	• The OHS Act will be followed.

Significance of Residual Effects

The development of the Project has the potential to interact with human health through temporary disturbance such as increases to traffic. However, the construction phase of the Project will be temporary and the ongoing operation of the Project is expected to result in minimal to no disruptions. Furthermore, the Project will provide a clean and renewable source of electricity generation that will ultimately help to mitigate climate change and reduce the amount of greenhouse gas emissions, which are positive environmental interactions. Therefore, with proposed mitigation, the residual interactions of the Project with human health are not expected to be substantive.

Throughout Project planning and design, the top priority has been health and safety. This is to make every reasonably effort to eliminate any negative potential impacts the Project may have on public health and safety. By following the proposed mitigative measures as well as regulatory guidelines pertaining to health and safety, the significance of residual effects on health and safety is expected to be negligible.

7.4 Cultural and Heritage VECs

7.4.1 Archaeological and Cultural Resources

Potential Interactions and Mitigation

The Project has the potential to interact with heritage resources via accidental discovery of archaeological resources during excavation activities. However, it is unlikely that heritage resources will be encountered in the Project areas because the Project is largely located on previously disturbed land, but as with any ground moving activity, such as excavation, the potential to uncover previously undiscovered heritage resources exists. Without mitigation, environmental effects include the potential permanent destruction of any previously undiscovered archaeological or palaeontological resources that might be present within the Project areas.

The potential interactions of the Project on archaeological and cultural resources and the proposed mitigative measures are summarized in Table 47.

TABLE 47: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION FOR ARCHAEOLOGICAL AND CULTURAL RESOURCES

Potential Interactions with Archaeological and Cultural Resources	Proposed Mitigative Measures
Direct impact to cultural resources during construction activities, such as blasting and excavation.	• Avoidance is the preferred method of mitigation in all instances where archaeological resources are present; • An archaeologist will walk over recommended Project areas prior to construction; • Ground intrusive work activities will not exceed the predefined Project areas; • Construction workers working within 80 m of a watercourse will be advised of the higher potential for archaeological resources; • Should archeological resources be encountered by chance during construction, all work in the area will cease immediately and the Archaeology and Heritage Branch of Nova Scotia Communities, Culture, Tourism and Heritage will be contacted at (902) 424-6475 for further mitigation; • Until a qualified archaeologist arrives at the scene, no one shall disturb, move or re-bury any uncovered artifact; • Activities at the site may resume only when authorized by Archaeological Services and once mitigation measures have been completed; • If bones or human remains are found, work in the area must cease, and the RCMP shall be immediately notified;

Potential Interactions with Archaeological and Cultural Resources	Proposed Mitigative Measures
	• No one shall disturb, move or rebury any uncovered human remains; • If the discovered resources are related to Indigenous culture, the Nova Scotia Office of L'nu Affairs will be contacted to determine how best to proceed with respect to repatriation of the resources; and • The Nova Scotia Museum of Natural History will be notified at (902) 424-7353, should fossils be encountered during the ground intrusive work.

Significance of Residual Effects

Given the history of the Project area, the potential to encounter previously undiscovered heritage resources during the construction phase of the Project is low, despite the proximity of the Project areas to several watercourses and lakes (note: all areas within 80 m of a watercourse are considered to have elevated archaeological potential until an ARIA determines those areas to be of low potential). As described above, no interactions are anticipated during the operation and maintenance phase or the decommissioning phase. In addition, results of the ARIA indicated that there are no known cultural heritage or archaeological resources located within the Project Development Area. It is recommended that any proposed impact areas for the Project be subjected to the Archaeological Reconnaissance phase of the ARIA prior to any ground disturbance activity. With the mitigation proposed, the significance of residual effects on archaeological resources is expected to be negligible as it is expected that should any resources be found onsite, that they can be successfully avoided.

7.5 Assessment of Potential Project Interactions with the Environment as a Result of Accidents, Malfunctions, and Unplanned Events

Potential Interactions and Mitigation

There is a potential for accidents, malfunctions, or unplanned events related to any project, particularly during the construction and decommissioning phases. Without proper mitigation, the Project could interact with many of the VECs as a result of accidents, malfunctions, or unplanned events associated with the Project activities. To limit accidents, malfunctions, and unplanned events during the Project, mitigation measures will be followed.

The potential interactions of the Project with VECs as a result of accidents, malfunctions, and unplanned events and the proposed mitigative measures are summarized in Table 48.

TABLE 48: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION FOR UNPLANNED EVENTS, MALFUNCTIONS AND ACCIDENTS

Potential Interactions due to Unplanned Events, Malfunctions and Accidents	Proposed Mitigative Measures
The accidental release of a hazardous materials through spills and vehicle traffic could affect soil, groundwater, surface water, wetlands, and fish and fish habitat through runoff or direct interactions at those VECs from a localized spill meandering into the receiving watercourses, potentially resulting in degradation of water quality or even mortality of fish during all Project phases.	• Loads of fill material will be thoroughly checked and secured for delivery to minimize potential for spillage and any spills will be promptly removed following applicable safety procedures; • Equipment shall be kept in good working order and maintained so as to reduce risk of spill/leaks and to avoid water contamination; • Spill response kits will be provided on site for each piece of equipment to ensure immediate response to a potential waste release and will be stocked with supplies to handle a worst-case scenario in surface or groundwater; • Onsite workers will be required to be knowledgeable of how to use spill kits; • Routine maintenance, refueling and inspection of machinery will be performed off-site or on level ground onsite; • Corrective measures will be implemented immediately; • Secondary containment and limited quantities of chemicals and fuels required to be stored on site shall be in an area away from the surrounding terrestrial environment, or direct pathways (i.e., ditches) to the surrounding environment; • If contaminated soil is encountered, it will be reported to NSE and managed utilizing the Nova Scotia Contaminated Site Regulations; • Refueling, oiling, and maintenance of equipment will be completed in specifically designated areas located at least 30 m away from any watercourse, wetland, or well to minimize potential effects that could arise in the event of a spill; and • Servicing of equipment will be completed off-site by a licensed mechanic; however if required to be completed on-site, the work will be completed over an impervious surface.
In the event of the failure of erosion and sediment control (ESC) measures, the discharge of runoff containing sediment to watercourses (i.e., surface water) and fish and fish habitat during storm events or spring runoff may result in the degradation of those VECs on a temporary basis.	• Construction of the ESC measures will be completed using quality materials and sound and proven construction practices in accordance with industry best practice; • Periodic inspection and maintenance (as required) of the ESC measures will be carried out, particularly prior to and following each major precipitation event; and • In the event of a significant ESC failure that results in noncompliance with a permit/approval, all work will

Potential Interactions due to Unplanned Events, Malfunctions and Accidents	Proposed Mitigative Measures
	be immediately stopped, and all available resources will immediately focus on mitigating the failure(s) in an effort to minimize negative impacts.
Several factors including but not limited to the accumulation of fill and materials for long periods of time, and minimizing disruptions at night (i.e., lights pointed up) can all increase the potential for interactions with wildlife (i.e., birds), potentially causing avoidance, sensory disturbance, or even mortality.	• Rubbish and waste materials will be kept at minimum quantities and burning of this material will be prohibited; • Waste materials will be collected on a regular basis and disposed of at an appropriate approved facility; and • If work is required at night, the area will be appropriately lit with shielded lights pointing downwards.
Fire may result in a loss of vegetation which has the potential to impact important habitats and food sources.	• Chemical and petroleum hydrocarbons will be stored in appropriate containers and in specifically designated areas to reduce potential for leaks. Where applicable, secondary containment of chemicals or petroleum hydrocarbons will be employed; • Oily rags will be stored in approved receptacles and disposed of at approved waste facilities; • No fires will be lit onsite; and • If fuel storage is required onsite, double walled fuel storage tanks will be required.
Harm to humans or wildlife as a result of collisions or accidents with equipment or vehicles throughout the project duration.	• Work entailing use of toxic or hazardous materials, chemicals, or otherwise creating hazard to life, safety of health, will be conducted in accordance with National Fire Code of Canada to minimize the potential for spills or fires; • Occupational health and safety measures will be in place throughout all phases of the Project; • Detour and other traffic control signs will be posted where necessary during construction to minimize traffic within the construction site; • Delivery of materials to site will be scheduled outside of peak traffic times, when possible; • Truck drivers will adhere to posted speed limits and warning signage and adjust driving to meet weather and road conditions; • All necessary permits will be obtained and industry best practices will be followed for special moves or traffic interruptions on public roads; • Any potential modifications to intersections for access to the Project Area will follow appropriate traffic controls and permitting; and • The construction schedule will be shared with nearby residents.

Significance of Residual Effects

With the implementation of the planned mitigation, and with the careful development and implementation of contingency and emergency response plans to be applied in the unlikely occurrence of an accident, malfunction, or unplanned event, interactions between the Project and the environment arising from an accidental event are not anticipated to be substantive.

7.6 Cumulative Effects

Cumulative effects are changes to the environment that are caused by an action in combination with other past, present and future human actions (Hegmann et al. 1999). Nearby wind energy projects to the proposed project include the South Canoe Lake Wind Energy Project, the Martock Ridge Wind Project and the Ellershouse Wind Project.

The South Canoe Lake Wind Energy Project is a 34-turbine project located approximately 8 km south-southwest of the Project. The Martock Ridge Wind Project (3 turbines) and the Ellershouse Wind Project (10 turbines) are located 8.6 km and 16 km east-northeast of the Project, respectively. The distances between these projects and the BMWP (i.e. outside of the LAAs for all VECs) suggests the potential for interaction between the residual effects of the combined projects is low. Regional population-wide effects due to the individual residual effects of each project could occur. However, population level impacts are unlikely, provided that highly sensitive or rare habitats, as well as concentration areas for species at risk, have been avoided by this Project.

The anticipated cumulative effects for this Project on migratory bats and birds are anticipated to be negligible and unmeasurable. In the context of other infrastructure that is also a source of collision effects, such as transmission/distribution lines, roads (Highway 14, Highway 101) and communication towers, the cumulative effect of these projects on wildlife, specifically on migrating birds is expected to be negligible (Zimmerling et al. 2013).

No other cumulative effects are anticipated.

7.7 Summary of Effects

Based on the assessment of the effects of the undertaking on the environment, the Project effects have been evaluated and a summary of the assessment is presented in Table 49 with the following criteria:

- Nature: positive (+), negative (-), or No Impact, where no impact is predicted;
- Magnitude: size of the potential impact – small, medium, or large;
- Reversibility: reversible (REV) impact or irreversible (IRR) impact;
- Timing : Duration of the anticipated impact – short or long-term;
- Extent: spatial extent of the impact – local, regional, provincial;
- Residual Effect: characterization of the residual effects – negligible, minor, significant, beneficial, or no impact.

TABLE 49: SUMMARY OF THE RESIDUAL EFFECTS FOR THE PROJECT

	Assessment of Potential Effects of Project on VECs					
VEC	Nature	Magnitude	Reversibility	Timing	Extent	Residual Effect
Physical Environment						
Weather Conditions	No Impact	small	N/A	Short	Local	Negligible
Climate and Climate Change	+	medium	N/A	Long	Provincial	Beneficial
Ambient Air Quality	-	small	REV	Short	Local	Negligible
Ambient Sound Levels	-	small	REV	Long	Local	Negligible
Geology	-	small	IRR	Short	Local	Negligible
Surface Water	-	small	REV	Short	Local	Minor
Groundwater	-	small	IRR	Long	Local	Minor
Shadow Flicker	-	small	REV	Long	Local	Minor
Visual Aesthetics	-	small	REV	Long	Local	Minor
Biophysical VECs						
Vegetation	-	small	REV	Long	Local	Minor
Wildlife	-	small	REV	Long	Local	Negligible
Wetlands	-	small	REV	Short	Local	Minor
Birds and Bird Habitat	-	small	REV	Short	Local	Minor
Bats and Bat Habitat	-	small	REV	Short	Local	Minor
Fish and Fish Habitat	-	small	REV	Short	Local	Minor
Species at Risk	-	small	REV	Short	Local	Negligible
Socioeconomic VECs						
Economy	+	Small	N/A	Short	Local	Beneficial
Land Use and Value	-	small	REV	Short	Local	Negligible
Transportation	-	small	REV	Short	Local	Negligible
Human Health and Safety	-	small	REV	Long	Local	Negligible
Cultural and Heritage VECs						
Archaeological and Cultural Resources	No Impact	N/A	N/A	N/A	N/A	No Impact

8.0 Effects of the Environment on the Undertaking

Effects of the environment on the Project are those effects related to risks of natural hazards and influences of the natural environment that might affect the normal execution of the Project or cause damage to infrastructure related to it. Potential effects of the environment on any project are a function of project or infrastructure design in the context of its receiving environment, and ultimately how the project is affected by the natural environment. These effects may arise from physical conditions, land forms, and site characteristics or other attributes of the environment which may act on the project such that the project components, schedule, and/or costs could be substantively and adversely changed.

Based on the nature of the undertaking, the following environmental attributes have been selected for consideration in this assessment:

- Climate and climate change;
- Severe weather events;
- Turbine Icing; and
- Forest fires resulting from causes other than the Project.

8.1 Climate Change

Climate is defined as the statistical averages of precipitation, temperature, humidity, sunshine, wind velocity, and other phenomena such as fog, frost and hail storms for a particular region and time period, generally taken over a 30 year period (NASA 2017). Climate change is an acknowledged change in climate that has been documented over two or more 30-year periods. According to the Intergovernmental Panel on Climate Change (IPCC), climate change may be due to natural internal processes or external forces, or to persistent anthropogenic changes in the composition of the atmosphere or in land use (IPCC 2014). The United Nations Framework Convention on Climate Change (UNFCCC) makes a distinction between climate change attributed to human activities and climate variability attributable to natural causes, by defining climate change as a change of climate directly or indirectly attributed to human activity that alters the composition of the global atmosphere, and which is in addition to natural climate variability observed over comparable time periods (IPCC 2014).

Climate change is important to consider as the project is expected to be operational for 25+ years. Some of the long-term effects of global climate change include rising temperatures, changes in precipitation patterns, increases in droughts and heatwaves, stronger and more intense hurricanes and in increase in sea level (NASA 2021). Climate change could impact the Project by impacting the ability of the WTG to function due to high temperatures. The Project site was selected in a location with an elevation greater than 100 m above sea level (ASL), therefore, the effects of sea level rise should not directly impact the operation of the WTGs. A summary of the ways climate change could impact the Project is presented in Table 50.

TABLE 50: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION OF EXTREME WEATHER EVENTS ON THE PROJECT

Potential Interactions due to Climate Change	Proposed Mitigation
Increase in temperatures could impact the function of the WTG	• The WTGs are designed with incorporated technology to prevent damage from rising temperatures. Weather conditions will be monitored throughout the operational life of the project with SCADA systems in place to remotely monitor the WTGs and with the ability to halt operations if needed.

8.2 Severe Weather Events

Extreme precipitation and storms can occur in Nova Scotia throughout the year, but tend to be more common and severe during the winter season. Winter storms can generally bring high winds and a combination of snow, rain and ice.

In Nova Scotia, an extreme rainfall event is when 25 mm or more rain falls over a 24-hour period, ECCC issues a rainfall warning when this is forecasted to occur (ECCC 2020).

Significant ice storms have also affected Nova Scotia with an increased frequency. Ice buildup on power infrastructure during these storms has led to significant damage to equipment and transmission/ distribution infrastructure, as well as impassable roads, wide-spread power outages, and health emergencies.

Severe weather events could potentially damage the wind turbines due to conditions exceeding the operational design of the wind turbines. High winds, extreme temperatures and icing on blades all have the potential to shut down the wind turbines. Extreme weather events that could occur at the Project site are listed in Table 51.

TABLE 51: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION OF EXTREME WEATHER EVENTS ON THE PROJECT

Weather Event	Potential Interaction with Project	Proposed Mitigation
Extreme wind	• Damage to blades	• Automated control system would initiate shut down.
Hail	• Damage to blades	• Appropriate wind turbine maintenance.
Heavy rain and flooding	• Flooding of road and project site	• The project has been sited on an elevated plateau in the landscape and the roads will be designed to maintain water flow where needed to prevent flooding and wash-outs from current precipitation levels and to mitigate risks associated with predicted increases in precipitation from climate change. Appropriate storm water management will also be implemented.

Weather Event	Potential Interaction with Project	Proposed Mitigation
Heavy snow	• Damage to wind turbine components	• Automated control system would initiate shut down.
Ice storms	• Icing on blades resulting in potential ice throw	• Automated control system would initiate shut down procedures until ice has melted.
Lightning	• Potential for fires within nacelle of wind turbines	• Lightning protection system would conduct electrical surge away from nacelle.

8.3 Turbine Icing

Ice accumulation on wind turbine blades can occur during the winter months when the appropriate conditions of temperature and humidity exist, or during certain extreme weather conditions, such as freezing rain (Seifert et al., 2003). In the event that ice builds up on the wind turbine blades, there are two types of risks possible: the first is ice throw from an operating wind turbine, and the second is ice fall from a wind turbine that is not in operation.

When a wind turbine is in operation, it is assumed that ice may collect on the leading edge of the rotor blade and detaches regularly due to aerodynamic and centrifugal forces (Seifert et al., 2003). The distance that the ice will be thrown from the moving wind turbine blade will vary depending on the wind speed, the rotor azimuth and speed, the position of the ice in relation to the tip of the blade, as well as characteristics of the ice fragment.

In a Canadian study titled *Recommendations* for Risk Assessments of Ice Throw and Rotor Blade Failure in Ontario (LeBlanc et al., 2007) ice throw was investigated to determine the risk probability for an individual to be struck by ice thrown from an operating wind turbine. The following parameters and assumptions were used:

- Rotor diameter of 80 m;
- Hub height of 80 m;
- Fixed rotor speed of 15 RPM (Rotations Per Minute);
- Ice fragment is equally likely to detach at any blade azimuth angle and 3 times more likely from the blade tip than the rotor;
- Ice fragments have a mass of 1 kg and frontal area 0.01 m^2;
- All wind directions are equally likely; and
- Ever-present individual between 50 m and 300 m (doughnut shaped buffer around WTG), individual equally likely in any given 1 square m within that area.

The statistical analysis found that individual risk probability for an individual is 0.000000007 strikes per year or, 1 strike in 137,500,000 years. For an individual to be ever-present in the defined area, this

assumes that the individual would be outside during the unpleasant weather necessary for icing conditions. This analysis does not take into account the presence of trees that could provide shelter from potential ice throw (Seifert et al., 2003). The wind turbines that will be used for the Project may have different specifications than used in this example; however, this should be used as a general example to understand the incredibly low probability of an individual being struck by ice throw.

As with trees, power lines, masts, and buildings, ice can accumulate on a stationary wind turbine, and will eventually be released and fall to the ground. Depending on the rotor position of the stationary rotor, different fall distances along the current prevailing wind will occur (Seifert et al., 2003).

8.4 Forest Fires

The Fire Weather Index is a component of the Canadian Forest Fire Weather Index System. The index provides a numeric rating of fire intensity, and is the general index of fire danger throughout the forested areas of Canada (Natural Resources Canada 2021c).

The mean Fire Weather Index in the West Hants area for July (i.e., normally the driest month of the year), when risk of forest fire is typically greatest, is rated from 5 to 10, as shown in Figure 22, which is the second lowest rating on the scale of possible fire risk. This risk is based on Fire Weather Normals data, representing the average value of a fire weather code or index over the 30-year period from 1981 to 2010 (Natural Resources Canada 2021c).

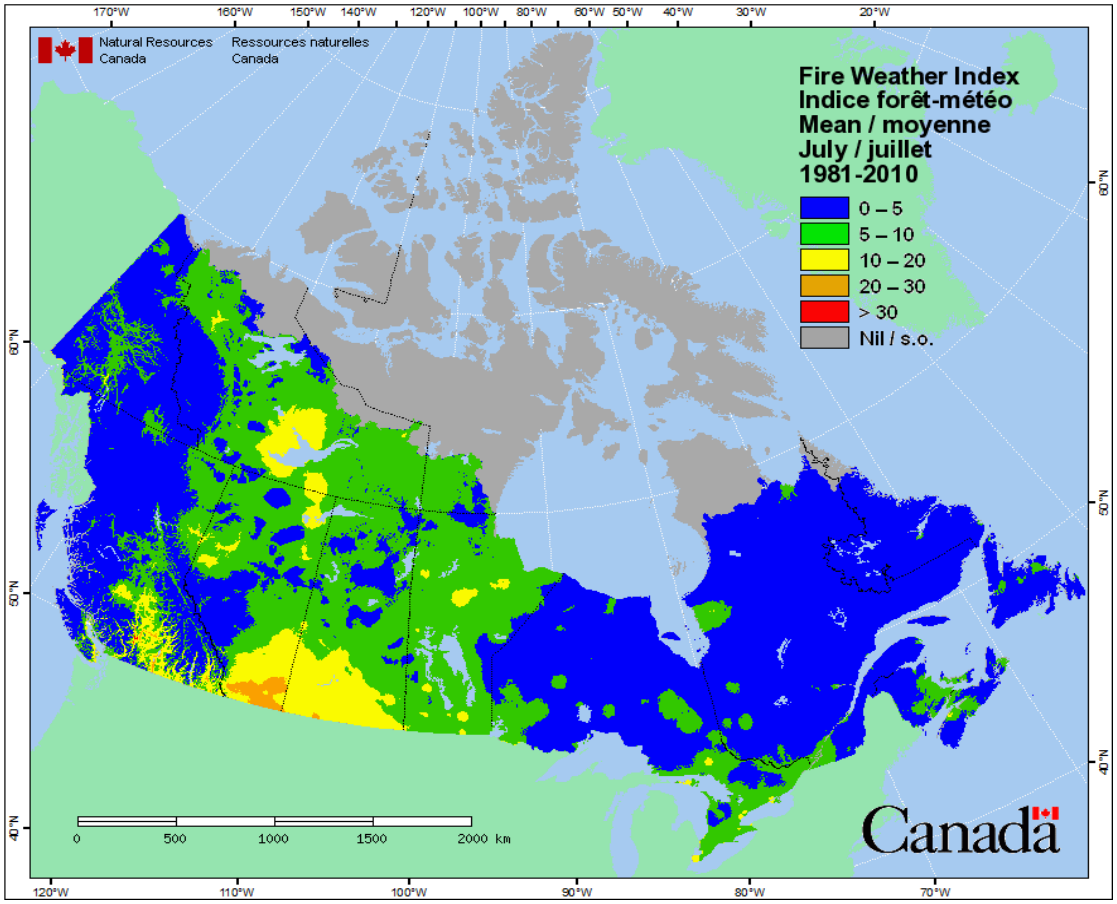

FIGURE 22: NATURAL RESOURCES CANADA FIRE WEATHER INDEX

8.5 Significance of Residual Effects

The Proponent recognizes the vulnerability of this project to impacts from the environment. However, careful design measures have been implemented based on the Project's location and the Project's technology to protect the Project from potential impacts from climate change, extreme weather and other environmental factors throughout the operational phase.

Extreme weather events have been considered while selecting the proper technology and the proper turbine model for its specific location. Using the most advanced technology will help ensure the turbine can withstand these events and that appropriate mitigation measures will be activated during the events. Examples of such mitigation measures include but are not limited to shutting down the turbine by pitching the blades, and rotating the hub to help avoid damage to the machinery.

Additionally, for extreme events occurring in the winter months, technology is now available that detects the formation of ice on the blades and shuts down the wind turbines until the ice has melted either passively or actively.

In the case of a forest fire or extreme weather event, the turbine can be shut down remotely if deemed necessary.

9.0 Greenhouse Gas Emissions

Operational wind projects reduce greenhouse gas (GHG) emissions by producing emission-free electricity that would have otherwise been produced by carbon-intensive energy sources, such as coal. This section details the methods and assumptions used to calculate the emission reductions the Project will cause over the operational lifetime.

9.1 Methodology

The methodology followed to complete the GHG emission analysis for the Project follows the international standard ISO 14064-1 and 14064-2. As is standard for this type of analysis, all emission values are presented in tonnes of carbon dioxide equivalent (tCO_2e).

Define Project Scenario

The Project consists of 28 wind turbines that collectively produce 150 MW of renewable energy. By supplying clean, renewable energy to the Nova Scotia Power Inc electrical grid, the Project is a GHG emissions reduction project within Nova Scotia. The operational term of the Project is assumed to be 25 years, from 2024 to the end of 2048.

Identify Project GHG Sources, Sinks and Reservoirs

The main sources of GHG emissions associated with the Project are during construction. This includes emissions related to manufacturing, installation, and commissioning for all Project components. A secondary source of GHG emissions will be during decommissioning, but this is not included in this analysis because it is difficult to estimate these sources so far in advance, especially since the Project could be retrofitted after the 25 years of assumed operation, rather than being decommissioned.

The main sink for GHG emissions, which reduces the emission rates, is the operational phase of the Project. This is when the Project is producing renewable, emission-free electricity that offsets emission-intensive sources of energy production.

There are no reservoirs associated with the Project.

Define Baseline Scenario

In order to quantify GHG emission reductions associated with the Project, a baseline scenario must be established as a reference point from which reductions can be made. In this case, the baseline scenario is a business-as-usual scenario in which the Project is not constructed and the Nova Scotia electricity emission intensities projected by the Government of Canada over what would have been the operational term of the Project are not offset (GoC, 2020).

This baseline scenario assumes that electricity imports have no emissions and that all fossil fuel based generation in Nova Scotia goes to domestic consumption.

Identify Baseline GHG Sources, Sinks and Reservoirs

The main source of GHG emissions associated with the baseline scenario is associated with the existing and projected electricity production sources in Nova Scotia.

There are no sinks or reservoirs associated with the baseline scenario.

Calculate Annual GHG Emissions Reduction for Project

Using standard emission factors from the Inventory of Carbon & Energy, Version 2.0; the Idemat App for Material Selection; and Canada's Greenhouse Gas Emissions Projections for Nova Scotia, the annual GHG emissions from each source and sink associated with the Project and the baseline scenarios was calculated. The emission factors are listed in Table 52. This calculation also used the following information:

- The expected annual production in MWh/yr from the Project based on wind data collected on site. This value is confidential at this time, so is not listed here.
- The following information about wind turbine manufacturing and transport:
    - Weight of steel for one wind turbine: 532,000 kg
    - Turbine tower distance traveled by marine cargo: 15,000 km
    - Weight of fibreglass for the blades of one wind turbine: 62,000 kg
    - Turbine blade distance traveled by marine cargo: 5,500 km
    - Weight of concrete for foundations of one wind turbine: 703,000 kg
    - Concrete distance traveled by road: 50 km

TABLE 52 CALCULATED ANNUAL GHG EMISSIONS REDUCTION FOR THE PROJECT

Input	Emission Factor
Electricity generated by wind turbines	0
Steel Production	1.50 kg CO_2e/kg
Marine Cargo	15.10 g CO_2e/tonne-km
Fibreglass Production	1.4 kg CO_2e/kg
Concrete Production	0.30 kg CO_2e/kg
Heavy Duty Diesel Truck	135.0 g CO_2/tonne-km
Average NS Electricity Production Emission Factor Projected from 2024 to 2048	0.243 t CO_2/MWh

The following steps were taken using this information to calculate the annual GHG emission reduction that will result from the Project:

1) Project Scenario:

a. Total emissions from Project manufacturing, installation, and commissioning were calculated. This value was then divided by 25 to get an emission value per year of Project operation. This value is 1,306 tCO2e/year.

b. Annual emissions from Project operation was calculated. This value is 0 tCO2e/year because it is a non-emitting, renewable source of electricity generation.

2) Baseline Scenario:

a. Annual emissions from the Nova Scotia grid from 2024 to 2048 based on the projected emission factor and the expected annual production from the Project were calculated.

3) GHG Emission Reduction

a. The annual Project scenario emissions were subtracted from the annual baseline scenario emissions.

9.2 Results

The Project is expected to reduce GHG emissions from the electrical grid in Nova Scotia by up to 128,000 tCO_2e/year.

10.0 Other Approvals Required

The Project also requires various other approvals, permits, and authorizations in order to proceed. The known requirements are summarized in Table 53, along with the relevant authority and current status.

TABLE 53: REQUIRED APPROVALS AND PERMITS FOR PROJECT COMPLETION

Approval/Permit	Agency	Jurisdiction	Status
Land Use Approval	Navigation Canada	Federal	Obtained
Aeronautical Assessment Approval	Transport Canada	Federal	Obtained
Radiocommunication Layout Authorization	Meteorological Services Canada, Environment, and Climate Canada Approval	Federal	Obtained
Radiocommunication Layout Authorization	National Radio Services, RCMP	Federal	Obtained
Radiocommunication Layout Authorization	Canadian Armed Forces, Department of National Defense	Federal	Obtained
Radiocommunication Layout Authorization	Canadian Coast Guard	Federal	Obtained
Development Agreement	West Hants Regional Municipality	Municipal	Submitted; ongoing

Approval/Permit	Agency	Jurisdiction	Status
Development Permit	West Hants Regional Municipality	Municipal	To apply upon Development Agreement approval
Building Permit	West Hants Regional Municipality	Municipal	To apply closer to construction start date
Watercourse and Wetland Alteration (WAWA) Permit	Nova Scotia Department of Environment and Climate Change	Provincial	To apply closer to construction start date when civil designs are complete, if required
Archaeology Field Research Permit	Nova Scotia Department of Communities, Culture, and Heritage	Provincial	Obtained
Special Move Permit	Nova Scotia Department of Transportation and Infrastructure Renewal	Provincial	To apply closer to construction start date, if required
Transportation Plan Approval	Nova Scotia Transportation and Infrastructure Renewal	Provincial	To submit closer to construction start date, if required

11.0 Funding

No government funding has been secured for the Project. If this changes, the Proponent will provide this information. Regardless of whether government funding is secured, the Proponent will fully fund the project through equity and financing.

12.0 Additional Information

All information necessary and relevant to this EA is included in the sections above.

13.0 Closure

Many adaptation and mitigation options can help address climate change; however, no single potion is sufficient alone. As discussed at COP26, substantial emissions reductions over the next few decades are required to limit climate warming to below 2 degrees Celsius relative to pre-industrial levels. The Benjamins Mill Wind Project and other similar projects represent an integral part of the global effort to reach these reduction targets, which the Province of Nova Scotia has recognized and integrated into legislation.

A thorough analysis of the Project components and activities has been carried out for all phases – construction, operation, and decommissioning – of the Project. Baseline existing environmental characteristics of the region have been documented and the VECs have been assessed. The Mi'kmaq in Nova Scotia have been and will continue to be engaged with and updated on Project activities, and a Mi'kmaq Ecological Knowledge study has been initiated. Consultation with the public and various stakeholders is ongoing to gauge the full range of impacts and concerns with regards to the Project,

which is integrated into planning efforts. The impact of the Project on the local environment has been evaluated based on these many criteria and mitigative measures have been presented and will be adopted to minimize the chance and reduce the significance of the potential residual impacts as a result of Project activity. Cumulative effects of the Project on the environment due to other regional Projects and activities have also been identified and assessed. From the data presented in the EA process, there are no significant residual environmental effects predicted for the construction, operation, and decommissioning phases of the Project.

The following benefits will result due to the Project and are considered as advantages of this development:

- Production of emission-free energy, which will displace energy produced from fossil fuels in Nova Scotia;
- Assist Nova Scotia in meeting the target of 80% renewable energy set in the Renewable Electricity Regulations made under Section 5 of the Electricity Act;
- Help decrease anthropogenic induced climate change, which is putting both human and environmental health at risk;
- Increase revenue to the West Hants Regional Municipality through the payment of annual property taxes;
- Increased revenue to local businesses due to activities associated with the construction, operation, and decommissioning of the Project; and
- Creation of additional employment in the region during all Project phases.

The Benjamins Mill Wind Project provides an excellent opportunity to transform fragmented habitat into a productive source of renewable energy, providing source diversity and helping to meet increasing energy demands in Nova Scotia. The Proponent is seeking to develop the proposed Project with the intent of helping Nova Scotia meet its renewable electricity targets while providing local economic benefits. The Proponent is pleased to provide this EA to the Policy, Planning & Environmental Assessment Branch of the Department of Environment and Climate Change and looks forward to working with provincial regulators to progress the Project to a construction ready stage.

14.0 Disclosure

This report was prepared by Natural Forces Developments Limited Partnership and Dillon Consulting Limited (Dillon). Both parties have used the degree of care and skill ordinarily exercised under similar circumstances at the time the work was performed by reputable members of the environmental consulting profession practicing in Canada. Dillon assumes no responsibility for conditions which were beyond its scope of work. There is no warranty expressed or implied by Dillon.

The material in the report reflects the Proponent's, and Dillon's, best judgment in light of the information available at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Dillon accepts no

responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Respectfully submitted,

Natural Forces Developments Limited Partnership

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15.2 Personal Communications