Ellershouse Wind Farm: Environmental Fact Sheet

Background

The Ellershouse Wind Farm (the Project) is a seven turbine, 16.1 MW wind energy project located in Ellershouse, Nova Scotia (Figure 1). The Environmental Assessment (EA) for the Project was registered with Nova Scotia Environment (NSE) on December 19, 2013. The full EA can be found at http://www.novascotia.ca/nse/ea/ellershouse-wind-project.asp. This overview provides a brief look at the results of the EA and lists future activities to be undertaken to ensure the Project meets environmental best practices and standards.

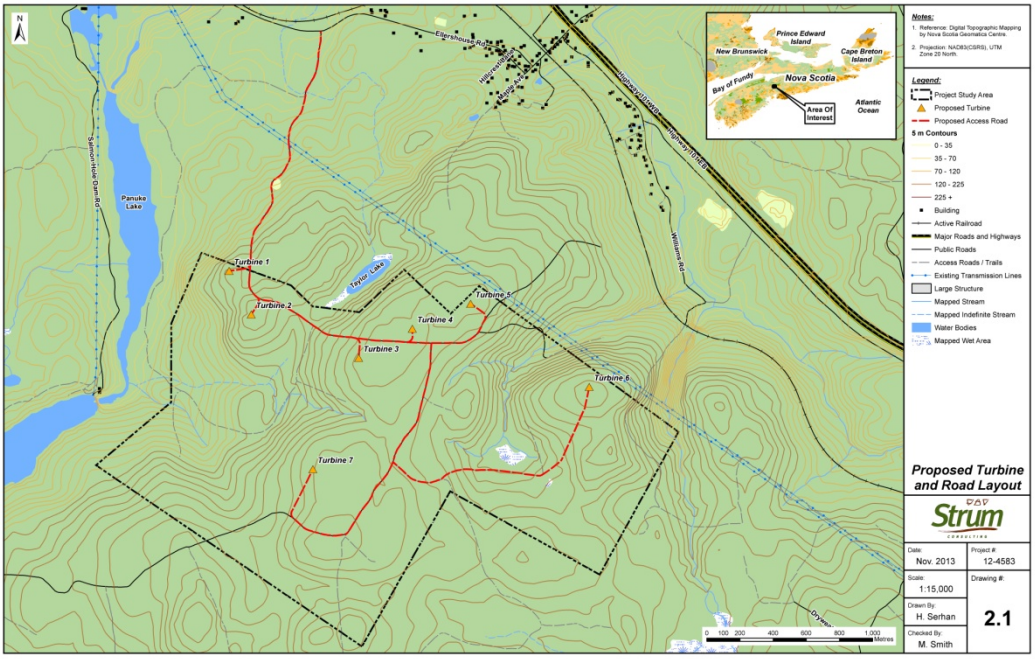

Figure 1: Site Plan.

Turbine locations were chosen to optimize energy yield while considering the following:

- Maintenance of a minimum 30 m (from tip of blade) buffer between turbine locations and field identified wetlands (NSE standard). NS Department of Natural Resources (DNR) requests that larger buffer distances (*i.e.*, 70 m from the tip of blade) are incorporated into Project design where a species of conservation interest (SOCI) has been identified during the breeding season within a wetland. Where appropriate, this buffer has been incorporated into Project planning.
- Maintenance of a minimum 1,000 m setback (exceeds the NSE standard) between turbines and permanent residences;
- Predictive sound modeling results to meet NSE standards (*i.e.,* 40 dBA for dwellings, daycares, hospitals, and schools);
- Predictive shadow flicker modeling results to meet NSE standards (*i.e.,* no more than 30 hours of flicker over a year and no more than 30 minutes of flicker on the worst day at dwellings, daycares, hospitals, and schools).

Studies were completed to establish existing environmental and socio-economic conditions. These studies included:

- Climate and Air Quality;
- Geology and Hydrogeology;
- Freshwater Environment and Fish Habitat;
- Plants;
- Terrestrial Habitats and Wetlands;
- Terrestrial Fauna;
- Birds;
- Bats;
- Socio-Economic Conditions;
- Human Health;
- Archaeology;
- Shadow Flicker;
- Radar/Radio Interference;
- Visual Impact; and
- Sound.

Climate and Air Quality

- Air emissions will be negligible.
- During the construction phase, a mitigation plan will be established to reduce air emissions including dust control.
- The mitigation plan will be part of the Project's Environmental Protection Plan (EPP) to be approved by NSE.

Geology/Hydrogeology

- Bedrock geology consists of the Goldenville Formation in the center of the site and the Halifax Formation to the north.
- The likelihood of acid rock drainage (ARD) to occur at the site will be determined following the results of the geotechnical evaluation. If ARD is found to be present, it will be handled in accordance with the Sulphide Bearing Material Disposal Regulations under the NS *Environment Act*.
- According to the NSE Well Log Database, there are no drilled wells within a 1 km radius of the Project site.
- Once the location of any required blasting is confirmed and the geotechnical investigation is completed, the need to implement mitigation measures or monitoring programs related to domestic wells will be evaluated.

Freshwater Environmental and Fish Habitats

- All water bodies on the Project site have been assumed to be fish bearing for the purpose of Project planning.
- No watercourses were observed within 100 m of proposed turbine locations and no mapped watercourses are present within 200 m of proposed turbine locations.
- An EPP will be developed for the Project, which will include provisions for an erosion and sediment control plan, spill contingency plans, and requirements for working near watercourses.

Terrestrial Vegetation

- Impacts to vegetation will be minimized by using existing logging roads to the extent possible.
- A plant survey was completed at the Project site in August 2013. No SOCI were observed on the Project site.

General Habitat Identification

- Based on aerial imagery interpretation, as much as 18.3% (83 ha) of the Project site has been cutover.
- Habitat mapping suggests that intact forest stands at the Project site are varied in their composition and successional stage. Balsam fir, red maple, red spruce, black spruce, and yellow birch characterize the canopy in most stands. Tolerant hardwoods, in general, are lacking from the site despite the prominence of well drained hilltops on the landscape.

Wetland Habitat

- Wetland delineation on the Project site was undertaken in Fall 2013.
- Based on the current layout, it is expected that minor wetland alterations (through the provincial permitting process) will be required in areas where upgrades and/or modifications to the access roads are required.
- No wetland alterations will be required in association with turbine pad locations.
- All turbines are located greater than 30 m (and where appropriate, 70 m) from the tip of a turbine blade from a wetland.
- Existing logging roads will be used where possible to minimize additional disturbance.
- An EPP will be developed and approved by NSE.

Terrestrial Fauna

- Mammals and herpetofauna species observed at the Project site are listed in the table below:

Mammal and Herpetofauna Species Observed during Field Studies

Common Name	Scientific Name	*SARA* Status[1]	NS *ESA* Status[2]	COSEWIC Status[3]	NSDNR Status[4]
American black bear	*Ursus americanus*	Not Listed	Not Listed	Not at Risk	Green
American porcupine	*Erethizon dorsatum*	Not Listed	Not Listed	Not at Risk	Green
Bobcat	*Lynx rufus*	Not Listed	Not Listed	Not Listed	Green
Green frog	*Lithobates clamitans*	Not Listed	Not Listed	Not Listed	Green
Snowshoe hare	*Lepus americanus*	Not Listed	Not Listed	Not Listed	Green
Spring peeper	*Pseudacris crucifer*	Not Listed	Not Listed	Not Listed	Green
White-tailed deer	*Odocoileus virginianus*	Not Listed	Not Listed	Not Listed	Green

[1]Government of Canada 2012; [2]NS *ESA* 2013; [3]COSEWIC 2012a; [4]NSDNR 2010

- Effects on mammals and herpetofauna species are considered very low, but are most prevalent during the construction phase of the Project.
- Habitat disturbance will be minimized to the extent possible.

- No SOCI were identified on the Project site. Desktop and field analyses for fauna SOCI revealed several species that have the potential to occur at the Project site. Species-specific mitigation techniques were recommended in the EA.

Bird Surveys

- Extensive bird surveys were conducted at and around the Project site, during which 60 bird species were identified.
- Bird studies included: breeding bird surveys, spring and fall migration bird surveys, a passage migration survey (fall), and a winter bird survey.
- It was determined that the Project is unlikely to have significant effects on migratory birds or bird SOCI.
- Clearing of the site will occur outside breeding and nesting season, unless otherwise authorized by NSE.
- An EPP will be established to be approved by NSE.
- Placement of turbines has avoided habitats significant to bird species (as identified during avian surveys) such as wetlands, mature forests, and areas with large, hollow trees.
- Post-construction monitoring will be implemented under direction from NSE and in consultation with Canadian Wildlife Service (CWS) and NSDNR to monitor for significant mortality trends. The duration of the post-construction monitoring will be determined in consultation with CWS and NSDNR.

Bat Studies

- Field surveys of bat migration/habitat use were carried out at two locations from August to September/October 2013 using two AnaBat SD2 Detectors.
- Only 20 bat echolocation calls, representing three species, were identified.
- It was determined that it is unlikely that the Project will have significant, adverse effects on bats.
- An EPP will be established to be approved by NSE.
- Placement of turbines has avoided habitats significant to bat species such as known hibernacula, wetlands, and lands directly adjacent to open bodies of water.
- Post-construction monitoring will be implemented under direction from NSE and in consultation with CWS and NSDNR to monitor for significant mortality trends. The duration of the post-construction monitoring will be determined in consultation with CWS and NSDNR.

Socio-Economic Conditions

- It is estimated that the Project will result in approximately $10 million in investments into the province of Nova Scotia.
- The Project is estimated to employ approximately 20-50 people during the construction phase.
- The Project will result in an increase in tax revenue to the Municipality.
- Local spin-offs will occur as a result of the increase in economic activity, particularly during the construction phase.

Human Health

- There is no evidence that the levels of infrasound produced by turbines present a risk to human health.

- Effects from Electromagnetic Fields (EMF) from wind developments are not significant.
- Ice throw can occur when ice accumulates on turbine blades and is subsequently thrown off. The wind turbines will be equipped with mechanisms to shut down the turbines if sufficient ice build up is detected on the blades by ice or vibrational sensors.
- Setbacks and safety awareness measures minimize any potential risk from ice throw.

Archaeology Study

- An archaeological study including a historic background study and reconnaissance of the Project site was completed to determine the potential for archaeological resources within the site.
- The site has been determined to be of low archaeological potential and, therefore, no further mitigation has been recommended at this time.

Shadow Flicker

- A shadow flicker study was undertaken to assess the effect on residences and other buildings within 2 km of the nearest turbine location.
- Modeling results indicated that no existing structure has predicted shadow flicker levels exceeding the NSE allowable level of no more than 30 minutes on the worst day and no more than 30 hours per year.

RADAR/Radio Interference

- An Electric Magnetic Interference Study was undertaken.
- Appropriate agencies have been notified of the Project to ensure interference is mitigated.
- Relevant agencies include NAVCan, Department of National Defence, RCMP, Environment Canada, Canadian Coast Guard, and Natural Resources Canada.

Visual Impact Study

- A visual impact study was completed and photomontages can be found in the EA.
- In general it was noted that the distance of turbines from permanent residences, in combination with the forested area helps reduce the visual impact of the Project.

Sound Study

- Acoustic modeling was undertaken to determine what effects the sound from the turbines will have on nearby receptors (buildings, schools, homes, etc).
- NSE require that sound at a receptor not exceed 40 dBA.
- Modeling results indicated that no existing structure has predicted sound levels exceeding 40 dBA with most receptors below 35dBA.

Public Consultation

- Public consultation has been ongoing.
- A Community Liaison Committee has been formed and has been meeting regularly.
- Residents within 4 km of the Project have received hardcopy newsletters which include Project updates and information on various Project milestones.
- A Project website and email list will continue to keep residents and the general public informed of the Project and its progress.

- An open house was held in Ellershouse in October 2013 and various meetings have occurred between the Project team and local stakeholders (see full EA for details).

Next Steps (Winter/Spring 2014)

- The EA was registered with NSE on December 19, 2013. Public comments can be submitted to NSE until January 28, 2014 with the Minister's decision expected on or before February 17, 2014.
- An EPP will be developed and will be approved by NSE prior to construction. The EPP will detail best practices and mitigative measures to be employed during construction to minimize potential environmental impacts.
- Provincial permitting will be sought for wetlands and watercourses related to road crossings.
- Environmental monitoring programs will be established in consultation with NSDNR and CWS for birds and bats.
- Erosion and sedimentation control plan will be developed and included within the EPP.
- A lighting plan will be developed in consultation with CWS and Transport Canada.