

Settlers Landing Wind Park and Snowy Ridge Wind Park – Frequently Asked Questions (FAQ)

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Capstone Power Development (“Capstone”) is proposing to develop two 10 megawatt (5-turbine) wind farms in the City of Kawartha Lakes: the Settlers Landing Wind Park (“Settlers Landing”) near the town of Pontypool, and the Snowy Ridge Wind Farm (“Snowy Ridge”) near the community of Bethany. Capstone is currently seeking a Renewable Energy Approval (“REA”) for the each project pursuant to Ontario Regulation 359/09 under the *Environmental Protection Act* (O. Reg. 359/09).

The project REA Applications are currently under technical review by the Ministry of Environment and Climate Change, and are open for public comment via the Environmental Registry (EBR - www.ebr.gov.on.ca). The EBR public comment period is another opportunity for community members and project stakeholders to submit their comments on the proposed projects and final Renewable Energy Approval (“REA”) reports.

In an effort to support stakeholders’ participation in the EBR process, Capstone has prepared this FAQ document to help facilitate further understanding of the projects’ impacts. This FAQ addresses the most common concerns and questions that have been raised during the project development process, focusing on questions relating to commercial-scale wind turbines and their impact on human health and safety, property values, the Oak Ridges Moraine, and natural heritage.

Human Health and Safety

Q: Will the projects have negative health effects on nearby residents?

The impact of wind turbines on human health has been studied and assessed in numerous reports. Now there are roughly 60 scientific peer-reviewed articles on this issue. The available scientific evidence demonstrates that electromagnetic fields (EMFs), shadow flicker, low frequency noise and infrasound from wind turbines are not likely to affect human health; some studies have found that audible noise from wind turbines can be annoying to some. Annoyance may be associated with some self-reported health effects (e.g., sleep disturbance) especially at sound pressure levels >40 dBA. Because environmental noise above certain levels is a recognized factor in a number of health issues, siting restrictions have been implemented in many jurisdictions to limit noise exposure.

In Ontario, the noise guidelines for wind turbines were developed consistent with the World Health Organization 2009 recommended night noise guideline of 40 dBA. The World Health Organization (WHO, 2009) night-time noise guideline, is a health-based limit (based on sleep) “...necessary to protect the public, including the most vulnerable groups such as children, the chronically ill and the elderly, from the adverse health effects of night noise.” Based on this, the province-wide setbacks are sufficient to ensure the safety of residents that live near the project, and there is no need to be concerned about negative health impacts from the wind turbines at the proposed Settlers Landing and Snowy Ridge projects.

Based on the findings and scientific merit of the research conducted to date, the weight of evidence suggests that when sited properly, wind turbines are not related to adverse health effects. This claim is supported by findings from a number of government health and medical agencies and legal decisions (e.g.,: National Health and Medical Research Council in Australia, 2010; Chief Medical Officer of Health (ON), May 2010; MassDEP and MDPH, 2012; Oregon Health Authority, 2013; National Health and Medical Research Council in Australia (Merlin et al., 2014)).

Q: Are there any health impacts associated with electrical cables and substations?

The science around transmission lines and possible health concerns has been extensively researched for decades. Government and medical agencies including Health Canada, the World Health Organization (WHO), the International Commission on Non-Ionizing Radiation Protection (ICNIRP), the International Agency for

Research on Cancer (IARC) and the US National Institute of Health (NIH) and National Institute of Environmental Health Sciences (NIEHS) have all thoroughly reviewed the available information.

As recently as November 2012 Health Canada has stated:

“Health Canada does not consider that any precautionary measures are needed regarding daily exposures to EMFs [electromagnetic fields] at ELFs [extremely low frequency]. There is no conclusive evidence of any harm caused by exposures at levels found in Canadian homes and schools, including those located just outside the boundaries of power line corridors.”

Health Canada also states: “When you are inside your home, the magnetic fields from high voltage power lines and transformer boxes are often weaker than those from household electrical appliances.”

Stray voltage can occur on grounded surfaces in buildings, barns, and other structures, and is a direct result of poor grounding practices, improper or inadequate wiring, or the breakdown of insulation in old wires or electrical loads. The projects’ electrical system will be designed and constructed in accordance with standard utility practices and meeting the required strict design and inspection requirements of the Electrical Safety Authority.

Q: *Does the operation of wind turbines pose a safety concern to nearby residents?*

The REA process consists of a rigorous and thorough set of regulations for ensuring that wind energy facilities are developed in a safe and environmentally responsible manner. Setbacks are stringent and set to ensure that wind turbines are operated a safe distance from people and property. The Settlers Landing and Snowy Ridge projects are required to adhere to a minimum setback of 550 metres, with increased setbacks based to ensure compliance with the 40 dBA noise limit, including cumulative impact of projects in the vicinity. In the case of the Settlers Landing project, the closest non-participating residence is 644 metres from Turbine 4. For the Snowy Ridge project, the closest non-participating residence is 568 metres from Turbine 2.

During operations, the rotation of the turbine blades can produce a shadow, depending on visibility and location of the sun in the sky, and the direction the wind turbine is facing; this phenomenon is known as a “shadow flicker.” A detailed shadow flicker assessment was included as part of the REA submission for each project (included in Appendix III of the *Design and Operations Reports*). The purpose of the assessment was to model and analyze expected shadow flicker for residences nearby the projects. For both the Settlers Landing and Snowy Ridge projects, the maximum expected shadow flicker over the course of a year for any non-participating residence is 25 hours. The shadow flicker assessment reports conclude that the shadow flicker from each project is not expected to cause adverse health or safety effects due to the low frequency of the flicker, and that nuisance impacts are expected to be minimal. As such, during operations, Capstone does not anticipate any material negative impacts to Project neighbours from turbine shadow flicker. In the unlikely event that a concern is raised, Capstone will work directly with any individuals to implement appropriate mitigation measures.

Another common public concern regarding the operation of the turbines is the possibility of ice throw from the blades during inclement weather conditions. Ice throw mitigation measures (as described in section 5.4.3.3 of the *Design and Operations Report*) will be implemented at the projects to ensure public safety and safe operation of the wind turbines. Mitigation measures include a passive ice-shedding system, whereby the turbines cease to operate when installed sensors indicate potential icing, and the requirement for a manual restart, post-icing event to ensure ice has been shed. Furthermore, site access roads will be signed at the entrance to restrict entry, and warn of the potential for ice-shedding. Given the turbine setback distances from roads and residences at the Settlers Landing and Snowy Ridge projects, and available mitigation measures, the potential risk to public safety from ice throw is not significant.

Q: *What level of noise can the community expect from the proposed projects’ turbines?*

The Settlers Landing and Snowy Ridge projects each consist of five Senvion MM92 2.0 MW wind turbines, and a 10 MVA (44 kV) main power transformer. The noise emissions of the equipment are considered during the

project design phase, and their compliance with O. Reg. 359/09 is required for the Ministry of the Environment and Climate Change to issue the Renewable Energy Approval. O. Reg. 359/09 sets a noise limit of 40 dBA at homes and residences (and other *noise receptors*, as defined by the regulation).

Following submission of the REA applications, noise impact assessment reports were prepared for both projects, and the results of these assessments are available for review on the Settlers Landing and Snowy Ridge project websites.

Property Values

Q: Will the projects have an impact on the property value of neighbouring properties?

There are a number of economic factors (from the local to global level) that can affect real estate prices; as such, it is difficult to attribute a single variable's contribution to a positive or negative change in the value of a specific property. To date, the evidence does not suggest negative impacts to property values will occur due to the introduction of a wind project into a community or within viewshed from a property. The broadest and most scientifically rigorous studies have all concluded that there are no material or long-term negative impacts on property values of homes from wind turbines¹. Although the scientific analysis cannot dismiss the possibility that property values could be impacted for a small number of homes, these cases are either too minor or too infrequent to result in a widespread statistically observable impact.

A 2012 decision issued by the Ontario Assessment Review Board ruled that there is no evidence that the presence of a wind farm affected the value of a waterfront property on Wolfe Island, in the Township of Frontenac Islands on Lake Ontario. As a result of their review and subsequent findings, the Board concluded that there was nothing to indicate that the value of the property had been negatively affected by the creation or operation of the wind farm, and confirmed the Municipal Property Assessment Corporation's (MPAC) assessment of the property.

In April 2014, MPAC released a study entitled "Impact of Industrial Wind Turbines on Residential Property Assessment in Ontario – 2012 Assessment Base Year Study." The study concludes that:

"2012 Current Value Assessments (CVA) of properties located within proximity to an IWT [Industrial Wind Turbine] are assessed at their current value and are equitably assessed in relation to homes at greater distances. No adjustments are required for 2012 CVAs. This finding is consistent with MPAC's 2008 CVA report. The 2012 CVA study also found that there is no statistically significant impact on sale prices of residential properties in these market areas resulting from proximity to an IWT. The study underwent a rigorous independent third-party peer review and includes appendices describing the study parameters and documenting the analyses."

The MPAC study examined data in 15 Market Areas across the province, resulting in consideration of over 1100 wind turbines and nearly 850 residences. Its conclusion, that there is no significant impact on property values and sale values due to proximity of wind turbines, is consistent with the findings of previous studies referred to above (see Reference i).

Oak Ridges Moraine

Q: Are any significant impacts to the Oak Ridges Moraine anticipated?

As shown on the project Site Plan included with the REA applications for each project, the projects are either situated on the Oak Ridges Moraine (ORM), in the case of Settlers Landing, or within a portion of the ORM, as with Snowy Ridge. The *Green Energy Act, 2010* provides exemption for renewable energy projects from the

requirements of the *Oak Ridges Moraine Conservation Plan* (ORMCP), given the nature and footprint of such projects and their net social and environmental benefits.

To further demonstrate that the projects will provide a net benefit without compromising the integrity of the ORM environment, Capstone has chosen to evaluate the projects for their compliance with the stipulations outlined in the ORMCP. The results of this evaluation are documented in a report entitled *Hydrogeological Impact Assessment and Oak Ridges Moraine Conservation Plan Conformity Review*. The report, which addresses both projects, is accessible on the Settlers Landing and Snowy Ridge project websites. In addition to characterizing the geological and hydrogeological conditions associated with the proposed locations of the projects, the report reviews whether there is any potential for the projects to cause any unacceptable impacts to local groundwater quantity and quality. The report concludes that, although renewable energy projects are exempt from the restrictions of the ORMCP, the proposed projects, as designed in accordance with O. Reg. 359/09 and industry best practices, are still found to be in compliance with the stipulations outlined under the ORMCP and not expected to cause any unacceptable impacts to local groundwater quantity and quality.

Capstone will follow mitigation measures, as documented in the *Design and Operations Report* prepared for each project, to protect the underlying aquifer systems from potential quality impacts associated with construction, operation, and decommissioning activities. For example, to minimize any risk of contamination, no refueling of vehicles or storage of potential contaminants will occur anywhere on the project sites, including areas of high aquifer vulnerability within the ORM. To address accidental spills, emergency spill response protocols will be followed, with the Ministry of Environment Spills Action Centre being notified as necessary. Standard containment facilities and emergency response materials will be maintained on site.

Natural Heritage

Q: Will the projects have an impact on birds and bats?

As part of the REA process, Capstone conducted extensive field studies and surveys to assess the potential impact of the Settlers Landing and Snowy Ridge projects on bird and bat habitats. Descriptions and results of these studies can be found in the *Natural Heritage Assessment and Environmental Impact Study* on the Settlers Landing and Snowy Ridge project websites. Site investigations were conducted to assess the presence of shorebird migratory stopover areas, raptor winter feeding and roosting areas, colonial bird nesting sites, landbird migratory stopover areas, open country bird breeding habitat, bat hibernacula, and bat maternity colonies. For the Snowy Ridge project, the studies found that no significant bird or bat habitat exist within the project area, including migration corridors. For the Settlers Landing project, the studies found no significant bird habitat within the project area. While initial field studies described in the *Natural Heritage Site Investigation Report* indicated potential for two bat maternity colonies to reside within 120 metres of the project area, June and July 2013 pre-construction evaluation surveys (as per Ministry of Natural Resources and Forestry guidelines) confirmed no presence of bat maternity colonies within the project area (please note these pre-construction reports can also be found on the project websites).

In addition to field studies and surveys conducted to date in accordance with O. Reg. 359/09, a comprehensive Environmental Effects Monitoring Plan (EEMP) was prepared for each project in accordance with Ministry of Natural Resources and Forestry (MNRF) guidelines (included in Appendix V of the *Design and Operations Report*). The EEMP provides details of all mitigation measures proposed for the projects during construction and operations. Capstone will conduct post-construction monitoring of bird and bat mortalities. Results of this monitoring will be compared to the MNRF's thresholds for acceptable mortality. If mortality rates are significant, operational mitigation measures will be implemented through the adaptive management program, as described in the EEMP.

More generally, compared to earlier generations of wind turbine technology, today's turbines use larger blades that rotate at lower speeds, making them safer for wildlife. Post-construction monitoring reports from wind power

projects in Ontario have shown that approximately 2.5 birds are killed per year, per turbine. Based on the number of turbines proposed at each project, we anticipate bird mortalities to be in the range of 10-15 per year. To put this in context, studies have shown that for each bird killed by a wind turbine, approximately 15,000 are killed by feral cats and 2,200 are killed by pesticides. Thus, relatively speaking, the anticipated bird mortality impact from the projects is not significant at the habitat population level. Bat mortality rates at wind facilities are highly variable among regions. Some species of migratory bats are particularly vulnerable, and mortality peaks during the late summer and early fall migration. The MNRF is the agency responsible for protecting bats, and has produced detailed and prescriptive guidelines for post-construction monitoring of bat mortality, and mandatory mitigation requirements for facilities with high bat mortality. As described above, Capstone will follow these guidelines to ensure that there are no significant impacts on bat habitat as a result of the operation of the projects.

References

ⁱCanning Consultants (Feb 2010). Wind Energy Study – Effect on Real Estate Values in the Municipality of Chatham-Kent; Township of Melancthon, Township of East Luther Grand Valley and County of Dufferin (2006); Ernest Orlando Lawrence Berkeley National Laboratory (Dec 2009). The Impact of Wind Power Projects on Residential Property Values in the United States.

Websites

www.capstoneinfrastructure.com/settlerslanding

www.capstoneinfrastructure.com/snowyridge