Environmental Review Tribunal

Case Nos.: 13-002/13-003

Alliance to Protect Prince Edward County v. Director, Ministry of the Environment

In the matter of appeals by Alliance to Protect Prince Edward County and Prince Edward County Field Naturalists filed on January 4, 2013 for a hearing before the Environmental Review Tribunal pursuant to section 142.1 of the *Environmental Protection Act*, R.S.O.1990, c. E.19, as amended, with respect to Renewable Energy Approval Number 7681-8UAKR7 issued by the Director, Ministry of the Environment, on December 20, 2012 to Ostrander Point GP Inc., as a general partner for and on behalf of Ostrander Point Wind Energy LP, under section 47 of the *Environmental Protection Act*, regarding the construction, installation, operation, use and retiring of a 9 wind turbine generator, Class 4 wind facility with a total name plate capacity of 22.5 megawatts located within South Marysburgh, Prince Edward County; and

In the matter of a hearing held over 40 hearing days in March, April, May and June 2013 at the Sophiasburgh Town Hall, Demorestville, Ontario, and at 655 Bay Street, Toronto Ontario with access by telephone conference call.

Before:		Robert V. Wright, Panel Chair Heather I. Gibbs, Vice-Chair
Appearances:		
Eric Gillespie, Natalie Smith and David Hwang	-	Counsel for the Appellants, Prince Edward County Field Naturalists and Alliance to Protect Prince Edward County
Sylvia Davis and Sarah Kromkamp	-	Counsel for the Director, Ministry of the Environment
Douglas Hamilton, Douglas Thomson, Bryn Gray, Darryl Cruz, Sam Rogers and Eric Pellegrino	-	Counsel for the Approval Holder, Ostrander Point GP Inc. as general partner for and on behalf of Ostrander Point Wind Energy LP
Parker Gallant	-	Representative for the Participant, Wind Concerns Ontario
Alban Goddard-Hill, Ian Dubin, Don Chisholm and Deborah Hudson	-	Presenters, on their own behalf

Dated this **3rd** day of **July, 2013.**

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REASONS FOR DECISION

Overview

[1] This appeal concerns a renewable energy approval issued by the Director, Ministry of the Environment ("MOE") on December 20, 2012 to put nine wind turbine generators with a total installed nameplate capacity of 22.5 megawatts (MW) and supporting facilities on 324 hectares of provincial Crown land in Prince Edward County. This is the first wind project approval in Ontario that is proposed to be located entirely on Crown land, known as the Ostrander Point Crown Land Block.

[2] The 135 metre ("m") high turbine towers would require concrete platforms, 5.4 kilometres of on-site access roads (in addition to the existing roads), underground cabling and overhead distribution lines, and a parking/maintenance yard at the north end, adjacent to a 25 mega-volt-ampere transformer substation for connection to the Hydro One grid. In keeping with the definitions used in the Approval Holder's application materials, the Ostrander Point Wind Energy Park will be referred to as the "Project". The proposed location of the Project on the Ostrander Point Crown Land Block is shown on the map attached as Appendix B (relevant legislation and rules are labeled Appendix A). The "Subject Property", also referred to in these reasons as the "Site", is synonymous with all of the Ostrander Point Crown Land Block.

[3] The Crown land would be leased to Ostrander Point GP Inc., as general partner for and on behalf of Ostrander Point Wind Energy LP (collectively, the "Approval Holder") for 25 years, with one extension for a further term of 15 years, via a "Commercial Wind Energy Lease".

[4] The Ostrander Point Crown Land Block is about 15 km south of Picton. It is roughly bordered on the north by Helmer Road, on the west by Petticoat Point Trail, on the east by Ostrander Point Road, and on the south by Lake Ontario. The Project would be located on the south shore of Prince Edward County, which is a peninsula that extends into the north east portion of Lake Ontario, approximately in the middle of the peninsula. At the eastern end of the peninsula is the Prince Edward Point National Wildlife Area, which hosts the Prince Edward Point Bird Observatory ("PEPtBO"), and Point Petre Provincial Wildlife Area is to the west. The Prince Edward County South Shore ("PECSS") peninsula is shown on Appendix C.

[5] The south shore of Prince Edward County is one of the least developed areas in the County with a low population, a mixture of year-round and seasonal residences, very few commercial operations and virtually no industrial operations. The Subject Property is relatively flat, with predominantly low lying vegetation, with a provincially

significant wetland in the southeast corner and seasonal wetlands scattered throughout, and other provincially significant as well as seasonal wetlands in the vicinity, and is bounded by Lake Ontario to the south.

[6] On January 4, 2013, Alliance to Protect Prince Edward County ("APPEC") and Prince Edward County Field Naturalists ("PECFN") filed appeals for a hearing before the Environmental Review Tribunal (the "Tribunal") pursuant to s. 142.1 of the *Environmental Protection Act* ("*EPA*").

[7] During the course of the 40 day hearing of this matter, the Tribunal received extensive evidence, including 185 exhibits and testimony of 31 expert witnesses, and submissions on both branches of the test that applies to a renewable energy appeal under s.145.2.1 of the *EPA*. They are: whether engaging in Project in accordance with the renewable energy approval (the "REA") will cause serious harm to human health, or serious and irreversible harm to plant life, animal life or the natural environment.

[8] For the reasons given below, the Tribunal concludes that the appellant citizen group APPEC has not met the first branch of the test regarding harm to human health because no causal link has been established between wind turbines and human health effects at the 550 m setback distance required under this REA.

[9] Regarding the second branch of the appeal test, for the reasons outlined below, the Tribunal concludes that the appellant citizen group PECFN has shown, on a balance of probabilities, that engaging in the Project in accordance with the REA will cause serious and irreversible harm to plant life, animal life or the natural environment. This is on the basis of findings that such harm will be caused to Blanding's turtle.

[10] As the Tribunal has determined that engaging in the Project in accordance with the REA will cause the harm referred to in s. 145.2.1(2)(b) of the *EPA*, it may, under s. 145.2.1(4) of the *EPA,*

> (a) revoke the decision of the Director;
>
> (b) by order direct the Director to take such action as the Tribunal considers the Director should take in accordance with the *EPA* and the regulations; or
>
> (c) alter the decision of the Director, and, for that purpose, the Tribunal may substitute its opinion for that of the Director.

[11] The Tribunal revokes the decision of the Director.

Relevant policies

[12] REAs are granted under the *Green Energy Act*, *2009*, S.O. 2009, c. 12, Sched. A ("*GEA*") and amendments made to the *EPA*. The *GEA* states the underlying policy of the Ontario government to be:

> The Government of Ontario is committed to fostering the growth of renewable energy projects, which use cleaner sources of energy, and to removing barriers to and promoting opportunities for renewable energy projects and to promoting a green economy.

[13] It is also the policy of the Ontario government to promote the use of Crown land for renewable energy projects. The Ministry of Natural Resources ("MNR") policy and supporting procedure regarding "Onshore Windpower Development On Crown Land" (no. PL 4.10.04) are dated January 28, 2008 and were issued on July 5, 2010. It states:

> To support the role that Crown land can play in providing areas for windpower projects, the Ministry of natural Resources (the Ministry) has developed a windpower policy and procedure to provide for a fair, consistent and orderly approach to the management of Crown land from project concept through to construction and operation. …
>
> 2.3 Goal
>
> To ensure that the management and disposition of Crown lands for windpower generaton contributes to the environmental, social and economic well being of the Province, by providing a fair, orderly and consistent approach for its development. …
>
> 3.1.2 Application Review
>
> The Ministry will review applications to ensure that a site is available for a windpower project and identify if there are any areas that may be prohibited due to existing land use and resource management statutes, regulations, or policies that would preclude a windpower testing project or windpower project.
>
> This initial review by the Ministry for coarse or broad level issues is not a replacement for a subsequent, more detailed review which will be carried out through the renewable energy approval processes.

[14] The municipal land use policies for the area are of interest, although not binding. The Noise Impact Assessment prepared for the Project provides a succinct land use description of the Ostrander Crown Land Block:

> The site is publicly-owned Crown land and municipal policy is not technically binding. Simlarly, the County's comprehensive Zoning By-Law does not apply. However, considering the local high-level policies in the Region of Prince Edward County's Official Plan is helpful in understanding the social context and municipal direction for the site and the surrounding area.
>
> Ostrander Point is bound by roads designated 'Rural Service' under Prince Edward County's Offical Plan in the north, east and west and by the Lake Ontario shoreline in the south. Schedule E, the Land Use plan

> for the Offical Plan, indicates the northern portion of the site is designated in part as 'Outdoor Recreation Land'. Generally, this designation is meant to provide a range of recreational and open space opportunities to residents and tourirists. The southern portion of the site in proximity to Lake Ontario is designated as 'Environmental Protection' under the Official Plan. Generally, this designation is meant to provide protection to wetlands indentified as provincially or locally significant or other wetland areas identified through air photos or field visits.
>
> There is one provincially significant wetland on the site. Schedule A indicates there is an Enviromentally Sensitive Area designated 'Other Sensitive Site or Area' adjacent to the south eastern corner of the site. This implies the presence of a representative example of the County's biological or geological history and diversity. …

The Ostrander Point Crown Land Block

[15] The Ostrander Point Crown Land Block is known for its alvar vegetation; providing habitat for species of concern including the provincially threatened Blanding's turtle and Whip-poor-will; being a migratory corridor/pathway for birds, bats and the Monarch butterfly; being the middle portion of the internationally recognized PECSS Important Bird Area ("IBA"); its provincially significant wetland; and being identified by the MNR as a candidate area of natural and scientific interest ("ANSI").

[16] Existing recreational land uses of the Ostrander Point Crown Land Block include camping, hiking, "birding", and "ATVing" (the use of all terrain vehicles). Paths and unfinished/gravel roads cross the Site, and there are fire pits on the lakeshore. Eric Prevost, an employee of the MNR, testified that overnight camping on Crown lands is generally permitted by default. There are no significant visible signs of the past use of the area as farm land and by the military for tank maneuvers and a testing range. The only existing structure on the Subject Property is a 60 m high meteorological tower.

Additional Project details

[17] Each of the nine turbines would require excavation and construction of a concrete platform octagonal in shape with a diameter of approximately 18 m and a depth of approximately 3 m and anchored into the bedrock. The turbine hub height is 85 m, with a rotor diameter of 100 m, for a total tip height of 135 m. The rotor swept area would be 7854 m^2. The three blades have a rotational speed of 5-14 rpm. The speed and blade angles to the wind can be adjusted. The row of four wind turbines along the shoreline would be set back 200 metres from Lake Ontario.

[18] Approximately 5.4 km of gravel access roads will be constructed, approximately 6 m wide with larger turnarounds. A gravel parking lot will be created of 21 x 47 m next to the transformer station. Crane pads (turbine assembly areas) measuring 20 x 40 m, adjacent to the turbines, will be used for construction and kept in place throughout the

life of the Project. During construction, turbines and their components will be placed in temporary "laydown areas", approximately 70 m long, close to the turbine base.

[19] A map of proposed turbine locations on the Ostrander Crown Land Block, along with set-back distances as described in the Noise Report prepared for the Approval Holder's application, is attached as Appendix D.

The appeal process

[20] The Director issued the REA on December 20, 2012. Also on December 20, 2012, the MNR issued a number of "tenure instruments" for the Project, such as temporary land use and work permits, easements for power lines, a Crown land lease for the turbines, and provision for the sale of Crown land for the transformer substation. The Non-Forestry Road-Use Management Strategy, appended to the Work Permit issued by the MNR for the proposed access road, provides that the Project is within General Resource Area E. "The general intent for Area E includes the encouragement of outdoor recreational opportunities through provincial parks, fisheries and wildlife production and forest production."

[21] On July 23, 2012 the MNR also issued Permit Number PT-C-003-12 to the Approval Holder under s.17(2)(c) of the Ontario *Endangered Species Act, 2007* (the "*ESA*") to allow it to "damage and destroy the habitat of Eastern Whip-poor-will", as well as to "kill, harm, harass, capture, possess and transport" both Blanding's turtle and Whip-poor-will, resulting from the development and operation of the Project, under the conditions listed (the "*ESA* Permit").

[22] The appeals for a hearing before the Tribunal were filed on January 4, 2013 pursuant to s. 142.1 of the *EPA*. Both APPEC and PECFN are citizen groups. The APPEC appeal focuses on the health issues under the first branch of the REA appeal test. PECFN appeal focuses on the environmental issues under the second branch of the REA appeal test.

[23] PECFN argues that this Crown land on the south shore of Prince Edward County is a highly sensitive ecological area and the wrong location for a wind farm because it is particularly susceptible to serious and irreversible harm, and that as Crown land, it "is a resource that belongs to all Ontarians." PECFN submits that if wind turbines can be erected in this location, then they can be erected anywhere in Ontario. PECFN further submits that the proposed "mitigation technologies are untested, uproven and unreliable."

[24] APPEC relies extensively on findings made in an earlier Tribunal decision, *Erickson v. Director (Ministry of the Environment),* [2011] O.E.R.T.D. No. 29 ("*Erickson*")

regarding the harm to health branch of the REA appeal test, and argues that, in the present case, the evidence of persons suffering serious harm from other windfarms under a variety of conditions, combined with a Case Definition proposed by Dr. Robert McMurtry, leads to the conclusion that this Project will cause serious harm to the health of persons living in its vicinity, including a highly sensitive resident.

[25] Wind Concerns Ontario ("WCO"), a participant, and the presenters Alban Goddard-Hill and Ian Dubin, oppose the Project at this location. The presenters Deborah Hudson and Don Chisholm support the Project at this location.

[26] The Approval Holder and the Director argue that the appellants have not met their onus under the statutory test for a REA appeal, the Project will not cause serious harm to human health or serious and irreversible harm to plant life, animal life or the natural environment and that any potential harm can be mitigated.

[27] Regarding the PECFN appeal, the Director submits that the issues raised by the appellant will be mitigated by the Approval Holder's adaptive management program and the *ESA* Permits. Regarding the APPEC appeal, the Director submits that there is no credible evidence that the alleged symptoms of the witnesses living near other wind farms have been caused by the turbines, and that "a 550 m setback to all receptors and a 40 dBA noise limit at all receptors protects the health of the public from serious harm."

[28] Regarding the PECFN appeal, the Approval Holder argues there are 12 legal principles that it submits underly the statutory appeal test, which has not been met. Regarding the APPEC appeal, the Approval Holder argues that the appellant has not proven that other wind farms have caused serious harm to human health, nor that wind farms cause harm to human health at the regulated 550 m set-back and 40 dB(A) noise limit, nor that this Project will cause serious harm to human health.

[29] The preliminary hearing was held on three separate dates in February 2013. Additional background information is contained in the order of the Tribunal dated March 1, 2013, in regards to the preliminary hearing.

[30] The hearing began on March 4, 2013. It proceeded in two phases: first the hearing of the environmental issues under the second branch of the REA appeal test, and then the hearing of the health issues under the first branch of the test.

[31] On March 5, 2013, the parties, the participant and the presenters, or their respective representatives, and the Tribunal panel went on a site visit of portions of the Ostrander Crown Land Block.

[32] The PECFN appeal hearing took place over 24 hearing days and the APPEC appeal hearing took 16 days. The Tribunal heard from nine witnesses for the appellant PECFN, 15 for the appellant APPEC, 10 for the Director and 13 for the Approval Holder.

[33] During the course of the hearing there were a number of motions, and other interlocutory matters, raised by the parties, and decided by the Tribunal. These are summarized as they are referred to in the decision.

[34] The evidence was completed on June 7, 2013. The parties provided written submissions to the Tribunal on June 13, 2013, and made oral reply submissions in person on June 21, 2013 at Toronto.

[35] Counsel for PECFN brought a motion on June 27, 2013 to allow further evidence under Rules 233 and 234 of the Tribunal's Rules of Practice ("Rules"). It is addressed at the end of these reasons under "Other Matters".

Issues

[36] The issues are:

1: Whether engaging in the Project in accordance with the REA will cause serious harm to human health.

2: Whether engaging in the Project in accordance with the REA will cause serious and irreversible harm to plant life, animal life or the natural environment.

3: If the answer to either Issue 1 (a) or (b) is "yes", whether the Tribunal should revoke the decision of the Director, by order direct the Director to take some action, or alter the decision of the Director.

Relevant Legislation and Regulations

[37] The relevant legislation and regulations are set out in Appendix A.

Discussion, Analysis and Findings

Issue 1: Whether engaging in the Project in accordance with the REA will cause serious harm to human health.

[38] Throughout this section, reference to "the appellant" is a reference to APPEC.

Groundwork laid by Erickson v. MOE

[39] In its opening statement, APPEC outlined how it would approach the test outlined in s. 145.2.1 of the *EPA*. The appellant noted that in *Erickson*, 25 expert witnesses were heard. Rather than re-calling those experts in this proceeding, the appellant took

the approach that this case builds on the findings made in *Erickson*, and allows the panel to focus on the remaining issues. In particular, the appellant relies on four points that it argues arise from *Erickson*.

[40] First, the appellant argues that Dr. Leventhall, an expert acoustician who testified on behalf of the approval holder in the *Erickson* hearing, accepted a list of health effects as resulting from "extreme annoyance". Paragraph 432 of *Erickson* reads as follows:

> 432 Dr. Leventhall was one of the authors of the AWEA/CanWEA Report. He stated that he agreed with the conclusions of the Report that there is no need to conduct any further study on the direct patho-physiological effects of wind turbine noise. He stated that the definition of direct patho-physiological effects comes from Dr. Pierpont's work (Pierpont 2009) and includes infrasound entering the body and vibrating the diaphragm or infrasound entering the ear and disturbing the vestibular system. He stated that annoyance is a completely different thing; it is a psychological effect which can induce physical problems due to high levels of stress. He stated that he accepted the symptoms that Dr. Pierpont described as wind turbine syndrome (sleep disturbance, headache, tinnitus, ear pressure, dizziness, vertigo, nausea, visual blurring, tachycardia, irritability, problems with concentration and memory, panic episodes) as the effects of extreme annoyance. He stated that they are largely somatoform disorders that occur when stress goes from your brain into your body and they occur in a very small number of people. Dr. Leventhall acknowledged that sleep disturbance is an adverse health effect. He stated that the conclusion in the AWEA/CanWEA Report that "sound from wind turbines does not pose a risk of hearing loss or any other adverse health effects in humans" was referring to direct effects on the body and he acknowledged that the words direct patho-physiological effects could be inserted in the conclusion to make it more accurate.

[41] Thus, APPEC argues that the following health effects are known to be caused by extreme annoyance, which need not be proven in this case:

- Sleep disturbance
- Headache
- Tinnitus
- Ear pressure
- Dizziness
- Vertigo
- Nausea
- Visual blurring
- Tachycardia (heart palpitations)
- Irritability
- Concentration/memory problems
- Panic episodes

[42] Secondly, the appellant argues that there was agreement in *Erickson*, as reflected at paragraph 640 of that decision, that the listed health effects are serious. The Tribunal noted in this regard that many of the medical conditions discussed were agreed to be serious, and that the debate is confined to whether the effects will result from the project:

> 640 In this case, there is apparent agreement that many of the medical conditions discussed by the witnesses are serious (the debate on those is, therefore, confined to whether they will result from the Project). It is, therefore, largely unnecessary to engage in an abstract discussion of the boundaries of "serious" in this case. There are several types of harm alleged by the Appellants that are clearly serious. The question is whether the Project will cause these types of harm, not whether they are serious. This is not to say that there is complete agreement on the appropriate categorization of the alleged harms raised by the Appellants. In fact, there is disagreement on the interplay between the concept of "annoyance" and "serious harm to human health". …

[43] The third point alleged is that the Tribunal in *Erickson* found at paragraph 819 that the appellants do not have to demonstrate the mechanism that is causing these effects. As a result, APPEC did not call evidence in this case to determine which mechanism, or which combination of them, is the operative one. Paragraphs 818 and 819 state:

> 818. One of the issues raised in the proceeding is whether the Appellants have to prove which mechanism(s) caused an effect or whether cause and effect is sufficient. It would seem that, when reviewing the test in the *EPA*, the key issue is whether the wind turbines will cause serious harm to human health. The mechanisms of how that harm occurs seem secondary to the finding of fact that the receptor will experience serious human health impacts resulting from a wind turbine operation.
>
> 819. For this reason, it is not necessary for the Tribunal to make a finding at this point in time as to whether noise from wind turbines is unique and different from other sources of industrial noise. … For the purposes of this Decision, the Tribunal finds that the Appellants can attempt to satisfy the section 145.2.1(2) test even if there is uncertainty about the specific mechanism that causes the alleged health effects. … What needs to be shown here, given the wording of the legal test, is that the effect is being caused by the Project, even if the exact mechanism is unclear.

[44] Fourthly, the appellant argues that, with respect to causation, *Erickson* "advanced the state of the debate". The appellant submits that the Tribunal in *Erickson* accepted that wind turbines can cause harm if placed too close to homes, and that the debate has evolved to one of degree. Paragraph 872 reads:

> 872. While the Appellants were not successful in their appeals, the Tribunal notes that their involvement and that of the Respondents, has served to advance the state of the debate about wind turbines and

> human health. This case has successfully shown that the debate should not be simplified to one about whether wind turbines can cause harm to humans. The evidence presented to the Tribunal demonstrates that they can, if facilities are placed too close to residents. The debate has now evolved to one of degree. The question that should be asked is: What protections, such as permissible noise levels or setback distances, are appropriate to protect human health? …

[45] APPEC relies on *Domtar Inc. c Québec (Commission d'appel en matière de lésions professionnelles),* [1993] 2 S.C.R. 756 at paragraph 59, to highlight the importance of consistency in tribunal decisions.

[46] The Approval Holder and the Director both accept the principle of persuasive case law, but argue that evidence should not be imported from one case into another, where the parties are different and had no opportunity to question or cross examine witnesses in the prior case. In any event, they argue that *Erickson* does not stand for the proposition that a causal link is no longer required. They argue that causation must be shown for APPEC to succeed in its appeal.

[47] The Tribunal agrees that it is unnecessary to re-hear the same uncontested evidence at each and every REA appeal. For example, it is well accepted in the occupational safety and environmental health field, as noted by the Approval Holder's witness Dr. Robert McCunney, that chronic, high levels of noise (70-80 dB(A)) can cause physiological health effects. The World Health Organization ("WHO") Nighttime Noise Guidelines recognize that lower levels of audible noise can cause stress and disturb sleep.

[48] It is a basic principle that legal conclusions from a tribunal decision are persuasive for a subsequent tribunal hearing, but not binding. The Tribunal also recognizes the importance of consistency in decision-making, especially where new legislation is beginning to be interpreted, such as with the REA appeals. The Tribunal should nevertheless be wary of relying on findings related to contested evidence from another case.

[49] Dr. Leventhall testified for the approval holder in *Erickson*, and although originally on the witness list for the Approval Holder in this proceeding, he was never called. If the Approval Holder disagreed with how Dr. Leventhall's evidence was interpreted in the earlier decision, or wished to have him give different or updated evidence, it clearly had the opportunity to do so. The Tribunal therefore infers that Dr. Leventhall's evidence, as reflected in *Erickson*, was not contested.

[50] The Tribunal accepts the findings in *Erickson*, which are unchallenged, that wind turbine noise can cause harm to human health if placed too close to residents. The

Tribunal also understands *Erickson* to say that an appellant does not have to establish whether harm is caused by low frequency noise, infrasound, or some other mechanism; however, it is clear from the legal test in s.145.2.1 of the *EPA* that causation must be shown. That is, whether human health is being harmed through direct effects (i.e., audible noise) or indirect effects (i.e., infrasound, low frequency sound, severe annoyance, or by some other mechanism), the appellant must show that the alleged effects are being caused by the project, and by the project when operating in accordance with the REA.

[51] The focus of the appellant's evidence in this appeal was on causation, and to establish that harm has been experienced at distances greater than the 550 m set-back provided for in the REA conditions.

Sub-Issue 1: Whether APPEC has established a causal link between wind turbines and human health effects

[52] The appellant sought to establish causation in three ways: through testimony of 11 individuals who resided within 2 km of an operating wind turbine project in Ontario ("post-turbine witnesses"); through testimony of Dr. McMurtry, an expert witness, to make the medical link between illnesses suffered and turbine noise; and through testimony of pre-turbine witnesses who allege they are sensitive to noise and live "in the environs" (2041 m) of a proposed turbine.

a. Post-turbine witnesses from other wind projects

[53] The post-turbine witnesses filed witness statements consisting of a completed questionnaire provided to them by counsel for APPEC, entitled Witness Information Form ("WIF"). The WIF was designed to elicit information relating to impacts the individuals believe were experienced due to proximity to wind turbines. A blank sample form is attached as Appendix F. Many witnesses also updated their WIFs prior to the hearing.

Interim Rulings

[54] There was extensive discussion at the preliminary stages of the hearing regarding the necessity of disclosing the witnesses' medical records. Counsel for the appellant originally took the view that medical records of the post-turbine witnesses to support the allegations of health effects caused by turbine exposure were not relevant or necessary to the proceedings. Both the Approval Holder and the Director argued that medical records were necessary in order to cross examine the witnesses on their statements.

[55] Following motions and lengthy discussions, the Tribunal made an oral ruling on March 6, 2013 that medical records of the post-turbine witnesses should be produced. The transcript of the Tribunal's oral ruling in this regard is attached as Appendix G. The Tribunal ordered that not less than half of all post-turbine witnesses to be called must produce medical documentation. Some of the witnesses were able to do so, and others were not. In an oral ruling on May 7, 2013, the Tribunal determined that sufficient medical documents had been produced such that 11 post-turbine witnesses could be called pursuant to the March 6, 2013 Order.

[56] In addition, the witnesses completed 175 responses to written interrogatory questions which were put to them pursuant to a consent agreement among the parties. The interrogatories were not entered into evidence but formed the basis for cross examination.

[57] Each post-turbine witness testified and was subject to cross-examination. The Approval Holder and Director raised issues around the neutrality of the witnesses, given that some have ongoing law suits against the turbine companies in their area and some have spoken out publicly against wind turbines. Nevertheless, the Tribunal finds that each witness testified in a forthright manner to the best of his or her ability and recollection, and finds all of the post-turbine witnesses to be credible in reporting their symptoms, and how their symptoms negatively impact their quality of life.

[58] The witnesses testified to a wide array of health problems, ranging from tinnitus and headaches to diabetes and high blood pressure, to severe psychological conditions.

[59] An issue arose as to whether these "lay witnesses" (i.e., persons not medically trained) could give evidence as to diagnoses they had been given, or give an opinion as to what medical condition they are suffering from. As noted by the Tribunal in *Kawartha Dairy Limited v. Director, Ministry of the Environment*, 2008 CarswellOnt 8830, confirmation of medical conditions requires the diagnostic skills of a qualified health professional. A separate question, however, is what reliance the Tribunal should place on post-turbine witnesses' beliefs as to the cause of their health concerns.

[60] In short, the witnesses were permitted to testify as to their symptoms (i.e., what they felt and experienced), and their understanding of what their doctors told them. They provided medical records in many cases, which noted dates and times of visits, the observations of the health professional, and prescriptions. In a very few cases, a letter from a specialist was provided which reflected a diagnosis.

[61] Another question that arose in the hearing was how the Tribunal would consider the information recorded in the medical records.

[62] Tribunals are empowered to accept hearsay evidence under the *Statutory Powers Procedure Act* ("*SPPA*"), although untested evidence is not generally given the same weight as that which is tested under cross examination. The notes and records of medical professionals included in the medical records produced, are hearsay evidence.

[63] The Tribunal heard a motion related to whether the documents should be admitted for "the truth of their contents", or whether they should be admitted as "business records", akin to s.35 of the *Ontario Evidence Act*. The Approval Holder and the Director consented to have the documents relied on as business records, but not for the truth of their contents with respect to medical diagnoses, akin to s.55 of that *Act*. The appellant argued they should be entered for the truth of their content, given the need for efficiencies in a time-restricted REA hearing and the broad discretion given to a tribunal under the *SPPA* with respect to evidence.

[64] The Tribunal held that it would accept the medical records into evidence as relevant information. Where a diagnosis was made, however, the parties should be given an opportunity to cross examine the health professional before the Tribunal would be able to accept the document for the truth of its contents. The transcript of the Tribunal's oral ruling on May 21, 2013 in this regard is attached as Appendix H.

[65] Some records include notes by medical professionals that the individual raised the issue of living in the environs of wind turbines, as a possible reason for their complaint. Such notes are considered to be a record of the interaction between medical professional and patient, akin to the business records provision under the *Evidence Act*.

[66] In no case, however, did a notation include a "diagnosis" by a medical professional that an illness resulted from exposure to wind turbines. This is not surprising as there is no case definition currently for "wind turbine syndrome" or anything of that nature, as acknowledged by APPEC's expert witnesses, referenced below. No health professionals were called for cross examination of the records.

[67] Counsel for the Approval Holder and the Director used the medical records to cross-examine the post-turbine witnesses, in order to test the validity of their assertion that relevant symptoms began or were exacerbated following the installation of a wind project, and to determine whether the causes of the symptoms were explored. The Tribunal wishes to note that it was important to the value of the oral evidence of the post-turbine witnesses, when it was able to be tested with documented histories.

Testimony of post-turbine witnesses

[68] The Tribunal heard from 11 post-turbine witnesses. The following chart notes the name of the Project closest to each of the post-turbine witnesses, and the approximate distance from their home to the closest turbine, as confirmed by them in their testimony.

Post-turbine witness	**Project name**	**Distance to closest turbine (m)**
Witness 1	Clear Creek, Frogmore & Cultus	526
Witness 2	Clear Creek, Frogmore & Cultus	433
Witness 3	Port Alma	641
Witness 4	Wolfe Island	1102
Witness 5	Wolfe Island	1154
Witness 6	Talbot	1776
Witness 7	Talbot	1066
Witness 8	Talbot	737
Witness 9	Melancthon	351
Witness 10	Melancthon	481.8
Witness 11	Kent-Breeze	1110

[69] As noted above, the witnesses were cross-examined through use of their medical records, where available. In some cases, the documents confirmed that the individuals had raised symptoms such as headaches and dizziness with their doctors, and asked for testing as to whether they might be caused by the turbines. In a number of cases, the questioning and close examination of the medical records revealed inaccurate recall of pre-existing health conditions, or the onset of conditions. Examples include the onset of high blood sugar or high blood pressure. Dates of onset or aggravation of conditions are important because APPEC argues they were caused by the turbines.

[70] The Tribunal wishes to emphasize that it found no attempts by any witness to mislead the Tribunal. Rather, expert witnesses including Dr. Cornelia Baines and Dr.

Kieran Moore described the common phenomenon of "recall bias", in which a person misremembers the timing or severity of past symptoms. It is a known hazard in designing reliable epidemiological studies. Dr. McCunney also spoke to this common phenomenon. The Tribunal has no difficulty finding that all the witnesses were credible, and some of the health conditions they described could certainly be described as seriously impacting their quality of life. The issue whether those health conditions were caused by wind turbines is the key question before REA appeals.

b. Dr. McMurtry's Case Definition

i) Description of Case Definition and weight to be given it

[71] Dr. Robert McMurtry was called as an expert witness by APPEC. He was qualified to give expert opinion evidence as a physician and surgeon with experience in the delivery of health care, health care policy and health policy.

[72] The Approval Holder and the Director objected to the qualification of Dr. McMurtry and to the admissibility of his evidence. While the Approval Holder and Director took no issue with Dr. McMurtry's expertise as requested, they argued that it was irrelevant to the issue to be determined by the Tribunal. Specifically, he is an orthopedic surgeon, not an epidemiologist or an expert in any of the illnesses allegedly caused by exposure to wind turbines. Secondly, they argued the evidence should be inadmissible as Dr. McMurtry could not be neutral and unbiased as required of an expert witness under the Tribunal's Practice Direction, due to involvement in wind turbine issues as an advocate. Dr. McMurtry is a former Director of APPEC.

[73] The Tribunal found that, despite Dr. McMurtry's involvement in wind turbine issues in general and with APPEC in particular, he could be qualified as an expert. The reasons include that health impacts of wind turbines is an emerging area of science with few experts at the ready to testify; that Dr. McMurtry has engaged with more individuals alleging these health effects than anyone in Canada; that Dr. McMurtry testified as an expert in the *Erickson* hearing; and due to his demonstrated personal integrity as an advocate of public health. The Tribunal found that issues of bias would go to weight, rather than admissibility of the evidence. With respect to the area of expertise, the Tribunal found Dr. McMurtry to be an expert in the area requested, and that it was not able to make a determination on relevance at the qualifications stage in the proceeding. An excerpt from the transcript of the Tribunal's oral ruling in this regard is attached as Appendix I.

[74] Although Dr. McMurtry's witness statement from the *Erickson* proceeding was referenced in his current witness statement and included in his book of documents, the

focus of Dr. McMurtry's evidence in this proceeding centred on his proposed case definition as described in his article "Toward a Case Definition of Adverse Health Effects in the Environs of Industrial Wind Turbines: Facilitating a Clinical Diagnosis", which was published in the peer-reviewed journal *Bulletin of Science, Technology and Society*, 2011 31 : 316.

[75] The Abstract for that article notes:

> This article identifies the need to create a case definition to establish a clinical diagnosis. A case definition is proposed that identifies the sine qua non diagnostic criteria for a diagnosis of adverse health effects in the environs of industrial wind turbines. Possible, probable, and confirmed diagnoses are detailed. The goal is to foster the adoption of a common case definition that will facilitate future research efforts.

[76] The Case Definition of Adverse Health Effects in the Environs of Industrial Wind Turbines ("AHE/IWT") ("Case Definition") is a central feature of APPEC's case. Dr. McMurtry testified that the Case Definition is intended to be used by primary health care practitioners, to identify whether a patient is suffering from AHE/IWT. It was not designed to be used in a court or tribunal. The article goes through possible, probable, and confirmed diagnoses.

[77] The article notes the following as *Possible adverse health effects*:

> Report of a change in health status by people living within 5 km of a wind farm installation. Further confirmation is required to validate or exclude AHE/IWT by establishing a medical history that satisfies the criteria identified under "Probable Adverse Health Effects" below.

[78] Under *Probable adverse health effects*, the article lists first-order, second-order and third-order criteria.

[79] The Case Definition requires that all four of the following first-order criteria be present:

a) Domicile within 5 km of industrial wind turbines (IWT)

b) Altered health status following the start-up of, or initial exposure to, and during the operation of, IWTs. There may be a latent period of up to 6 months

c) Amelioration of symptoms when more than 5 km from the environs of IWTs

d) Recurrence of symptoms upon return to environs of IWTs within 5 km.

[80] At least three of the four listed second-order criteria must occur or worsen after the initiation of operation of IWT:

a) Compromise of quality of life

b) Continuing sleep disruption, difficulty initiating sleep, and/or difficulty with sleep disruption

c) Annoyance producing increased levels of stress and/or psychological distress

d) Preference to leave residence temporarily or permanently for sleep restoration or well-being.

[81] The Case Definition requires that at least three of 18 third-order criteria occur or worsen following the initiation of IWTs. The third-order criteria are divided into 6 systems: otological and vestibular, cognitive, cardiovascular, psychological, regulatory disorders, and systemic.

[82] Under *Confirmed adverse health effects*, the article notes:

> The confirmation of AHE/IWT is achieved by a clinical evaluation and physiological monitoring of individuals during exposure to IWT sonic energy or an accurate facsimile (recording or other imitative source of IWT sound). Ideally, sleep studies should be carried out in the home of people experiencing AHEs. The complex physiological monitoring equipment required for a sleep study is not readily made mobile. Accordingly, sleep studies need to be carried out in an established clinical sleep laboratory with a source of sonic energy that accurately reflects the person's exposure to IWTs.
>
> The process may be simpler once controlled studies comparing possible victims with a nonexposed matched population are carried out. These studies could help determine the core physiological change(s) that is (are) likely occurring to those who live in the environs of IWTs.
>
> The need to rule out alternate explanations is the responsibility of the licensed clinician. While adherence to the criteria has resulted in no false positive diagnosis to date further validation is required.

[83] Lastly, the article includes a section on "Differential Diagnosis". It considers three other possible explanations for the listed symptoms: the wind itself; a stressful home environment; and psychological issues and/or mood disorders that may be simultaneously or independently present. The article notes that for each of those explanations, there is a lack of correlation of the onset of symptoms with the IWTs starting up, or symptom improvement when away from the turbines, or a revealed preference for sleeping away from home. The article concludes that "Apart from the foregoing, there are very few if any imitative AHEs that can meet the three orders of criteria outlined above. However, the author invites critical commentary that might indicate a different conclusion."

[84] Dr. McMurtry explained that the conditions are sequential; that is, if the conditions listed in the first and second-order criteria are not met, one would not

proceed to consider the third-order criteria. In response to the concern that the Case Definition contains a multiplicity of symptoms, Dr. McMurtry cited the example of adverse drug reactions reporting ("ADR") where there is a problem with ADR reports capturing only a tiny fraction of the total side effects experienced by patients. He noted that "the implications for the (under)reporting of adverse health effects in the environs of IWT is obvious". While he agreed there are numerous symptoms listed under the third-order criteria, Dr. McMurtry commented that they must not be taken to the exclusion of first and second-order criteria: "Taken alone the third-order criteria are unhelpful in establishing a diagnosis."

[85] He testified that the first-order criteria are not self-reported. Rather, they would arise in discussions between an individual and the primary health care practitioner, such as a family doctor or chiropractor.

[86] He also explained that the second-order criteria are not symptoms, but a "history of" these criteria. While Dr. McMurtry acknowledges that the histories such as sleep disturbance are common in the population, he notes they are only relevant if they started or worsened after a wind turbine project began. If "quality of life" or "stress" are raised, they should lead to further discussion with the primary health practitioner.

[87] With respect to the third-order criteria, Dr. McMurtry testified that it is not a complete list. The conditions listed in the article were chosen because they are the most frequently occurring within the symptoms reported among individuals he has spoken to, and complaints made to a self-reported telephone survey he is familiar with.

[88] Dr. McMurtry testified that the 5 km distance noted in the article is not a recommended set-back for wind turbines; rather, it is mentioned because the Case Definition is intended to be used into the future, and turbines are getting larger all the time with a correspondingly higher sound energy output. This number was arrived at through consultations with various people, including those who allege AHEs, medical professionals and, to get an idea of legal ramifications, Mr. Gillespie. Dr. McMurtry testified that he believes a 2 km setback would be appropriate to protect the health of residents, for the current size of turbines. This is also the setback recommended by Wind Concerns Ontario.

[89] Dr. McMurtry acknowledged that the Case Definition has not yet been validated.

[90] He agreed that two types of studies are still needed: laboratory tests that can confirm the diagnosis (he noted work being done by researchers to create a device that would imitate the signature sound of a wind turbine, at which point testing could take

place in the home), and epidemiological studies to determine the incidence of AHE/IWT in the general population.

[91] Dr. McMurtry testified that whether a person's response to IWT is psychological or truly physical, is a false dichotomy. He referred to the WHO which has noted that this separation is a fiction.

[92] In his reply to criticisms by other expert witnesses that there was no plausible biological mechanism for AHE/IWT, Dr. McMurtry cited the 2010 report by HGC Engineering, led by Brian Howe, commissioned by the MOE. The HGC Report noted :

> The audible sound from wind turbines, at the levels experienced at typical receptor distances in Ontario, is nonetheless expected to result in a non-trivial percentage of persons being highly annoyed. As with sounds from many sources, research has shown that annoyance associated with sound from wind turbines can be expected to contribute to stress related impacts in some persons.

[93] Dr. McMurtry cites literature observing that chronic stress related impacts are possible on all body systems in some sensitive people.

[94] He further cites the WHO 2011 document "*Burden of Disease from Occupational Noise (Quantification of healthy life years lost in Europe)*" which notes at p. xvii:

> There is sufficient evidence from large-scale epidemiological studies linking the population exposure to environmental noise with adverse health effects. Therefore, environmental noise should be considered not only as a cause of nuisance but also as concern for public health and environmental health.

ii) Application of Case definition to post-turbine witnesses

[95] With respect to the application of the proposed Case Definition in this case, Dr. McMurtry reviewed all of the WIFs completed by post-turbine witnesses who were to be called by APPEC. Dr. McMurtry concluded, as per his witness statement of January 24, 2013, that in all cases "the symptoms described by the individual witnesses meet the case definition of adverse health effects in the environs of Industrial Wind Turbines ("IWTs") as defined in my article…." He added that there were four individuals (only three of whom testified in this case) who "did not provide sufficient information in their Witness Information Form or Supplementary Witness Information Form to make a determination on all listed criteria, however, their symptoms are consistent with the case diagnosis". In oral testimony, Dr. McMurtry noted that he had since received further information regarding the three witnesses in question, and he found they also meet the criteria.

[96] Dr. McMurtry acknowledged on cross-examination that he did not "diagnose" any of the post-turbine witnesses as a result of the information he received from their WIFs.

He had more information for two individuals than for the others because he saw them in his medical practice as an orthopedic surgeon. He stated, however, that he would make the determination for all the post-turbine witnesses, that their "findings are compatible" with the Case Definition. He acknowledged that none of the post-turbine witnesses have a "confirmed" diagnosis by these criteria.

[97] Dr. McMurtry noted that it is not his custom to make a diagnosis in this fashion; however, what has happened here is out of the ordinary. He said that the individuals were scrutinized and cross-examined by legal counsel for both sides. He testified that as a result, the process that has emerged in this hearing is more vigorous than he would use in his practice.

[98] Dr. McMurtry noted that he does not use the term "wind turbine syndrome", which has been used in articles in the past to denote impacts from wind turbine sound energy on the inner-ear, although this is unproven. He therefore avoids this diagnostic category. Dr. McMurtry testified that he does not profess to know the pathway by which people are experiencing adverse health effects.

iii) Criticisms of the Proposed Case Definition and its application

Dr. Kieran Moore

[99] Dr. Kieran Moore is the Associate Medical Officer of Health for Kingston, Frontenac, Lennox & Addington. He testified on behalf of the Director. He was qualified to provide expert opinion evidence as a physician with expertise in family and emergency medicine, public health and preventative medicine.

[100] Dr. Moore testified as to Dr. McMurtry's proposed Case Definition, what use a physician could make of the WIFs and medical records provided by the post-turbine witnesses, and whether the Ontario Guidelines that require wind turbines to be set back 550 m from a receptor are protective of public health.

[101] Dr. Moore summarized at paragraph 100 of his witness statement the medical conclusions that he felt could be reached after reviewing the WIFs and medical records of the post-turbine witnesses:

> In summary, it is a challenge to come to any scientific conclusions regarding the witness information provided, given the subjective nature of the symptoms, the limited documentation of overall exposures and limited medical histories provided. The reported complaints are very common clinical conditions, especially those that refer to depression, sleep disorder, vertigo or dizziness, as documented by the prevalence study described above. In fact, this would be a normal list of patients presenting in a family doctor's office anywhere in Ontario, given the high prevalence of these symptoms in our population. Many witnesses document significant medial pathology that was present before the

> implementation of the wind turbines. The information only includes a very limited set of data for evaluation. More complete records and further investigation of underlying medical and social problems is required. Other factors can be predisposing to these subjective complaints, such as age, gender, marital status, employment status, education; income, health insurance coverage, nutrition; social stresses and pre-existing medical and psychiatric problems.

[102] Dr. Moore noted at paragraph 121 that "This submission of witness information forms is a very small sample of the total population exposed to noise from wind turbines in Ontario. This sample may have significant recall, reporting, interview, selection and exclusion biases".

[103] Dr. Moore outlined some common side-effects to common medications, many of which have been prescribed for a number of post-turbine witnesses, and which produce symptoms among those in Dr. McMurtry's third-order criteria.

[104] He also noted that many of the chronic conditions listed by the post-turbine witnesses wax and wane, which could explain temporary improvement or deterioration of symptoms by the witnesses, which they may subjectively associate with being close to or away from the turbines.

[105] Dr. Moore testified that "Hill's criteria" are the most widely accepted guidelines that have been developed to enable a critical evaluation of evidence from epidemiological studies to infer a causal relationship. Hill's criteria include the strength of association, consistency, specificity, temporality, biological gradient, plausibility, coherence, experimental evidence, and analogy.

[106] Dr. Moore testified that the MOE Guidelines require a minimum setback for wind turbines of 550m, which is intended to limit sound level at the nearest residence to 40 decibels, in the "A" weighted scale ("dB(A)"). Dr. Moore noted that this limit is consistent with the WHO Night-Time Noise Guideline of 40 dB(A) for the protection of human health.

[107] Dr. Moore concludes, on his review of the existing scientific evidence, that:

> In my opinion, appropriate evidence-based regulations to guide industry and protect the population from any significant exposure or harm from noise from wind turbine shave been put in place. To date, the scientific literature does not provide any convincing evidence of health effects, other than annoyance and indirect health effects, at current regulated setbacks and sound levels in Ontario. While a strong relationship has been found between annoyance and being able to hear the wind turbines, a strong relationship has also been found between annoyances and being able to see the wind turbines. This finding suggests it may not the noise of the wind turbines causing the alleged health problems.

Dr. Cornelia Baines

[108] Dr. Cornelia Baines is a Professor Emerita in the Dalla Lana School of Public Health at the University of Toronto, and a Fellow of the American College of Epidemiology. Dr. Baines was qualified to give opinion evidence as a physician-epidemiologist with special expertise in the design, measurement, and evaluation of research studies.

[109] Counsel for APPEC raised an issue with respect to the neutrality of Dr. Baines, given her history of testifying on behalf of wind turbine proponents. As with the other witnesses, the Tribunal found such arguments would go to weight rather than admissibility.

[110] Dr. Baines' criticism of the idea that one could prove serious harm to human health through the post-turbine witness' experience is summed up in the phrase: "the plural of anecdote is not data". In other words, a small group of persons self-reporting does not give a reliable sample upon which one can rely to draw broader conclusions.

[111] She opines at paragraph 10 of her witness statement that "the most compelling evidence to prove that 'serious' adverse health effects are caused by wind turbines would be the demonstration that the complaints that have been documented by turbine opponents are either totally different or, if not different, greatly in excess as compared to complaints suffered by the general population." She states this has not been done.

[112] Dr. Baines raised the possibility that the large variety of illnesses reported by wind turbine opponents from exposure to wind turbines may be psychogenic. She stated that psychogenic diseases are physical illnesses that stem from emotional or mental stresses. She testified they may also arise from prior expectations, and in this regard she referenced a recent research paper from Australia, Chapman et el., "Spatio-temporal differences in the history of health and noise complaints about Australian wind farms: evidence for the psychogenic, "communicated disease" hypothesis" (Submitted for publication).

[113] Dr. Baines elaborated on the seven relevant criteria to demonstrate causation: temporal relationship between cause and effect; strong association between cause and effect; specificity; constancy (i.e., the effect reliably follows the cause); biological plausibility; dose-response effect; and reversibility. In Dr. Baines' view, none of the seven criteria are satisfied in this case.

[114] Dr. Baines discussed the prevalence of the symptoms reported in the proposed Case Definition, in the general population. She notes that a recent poll by the US National Sleep Foundation, with 1,506 respondents, found that

> 75% experience insomnia, snoring, sleep apnea or restless legs syndrome a few nights a week or more, 33% of those polled experience at least one insomnia episode every night or almost every night and a further 21% have these symptoms a few nights a week.

[115] She quotes other studies that show 51.7% prevalence of chronic diseases in the general population, several of which are included in the proposed Case Definition such as high blood pressure and diabetes. In short, she states that all of the symptoms listed in the proposed Case Definition are very prevalent in the general population, and many increase with age.

[116] Dr. Baines lists the symptoms reported in the WIFs, and concludes "the reality of these symptoms is not disputed. What is disputed is that the symptoms are caused by wind turbines."

Dr. Robert McCunney

[117] Dr. McCunney is a medical doctor, board certified in occupational and environmental medicine and a research scientist at the Massachusetts Institute of Technology Department of Biological Engineering. Dr. McCunney co-authored a 2009 review of the peer-reviewed scientific literature with respect to wind turbines and human health (Colby et al, 2009). Dr. McCunney was qualified to give opinion evidence as a medical doctor, specializing in occupational and environmental medicine with particular expertise in health implications of noise exposure.

[118] Dr. McCunney comments that the proposed Case Definition was published in a journal with a low influence rating, and which is not indexed in the USA National Library of Medicine's database known as PubMed.

[119] Dr. McCunney notes that, once the first order criteria are met, "there are 72 different combinations of symptoms that would result in a 'diagnosis' of AHE/IWT. These numerous combinations reflect a lack of precision and sensitivity in the case definition". In addition to the lack of precision, Dr. McCunney also believes the Case Definition lacks "biological plausibility" for a large number of the listed symptoms.

[120] Dr. McCunney notes that in the evaluation of any potential exposure-related illness, it is critical to define the exposure and specify how it was measured or estimated. In this case, the exposure is to wind turbine noise. However, rather than including an objective exposure metric such as noise measurements or scientifically credible estimates, he notes, the Case Definition proposes the exposure metric to be "living within 5 km of a wind turbine". Dr. McCunney believes this metric is too imprecise and "sets the stage for false positive assessments", and appears to be

arbitrary and not based on any specific scientific references. In any event, distance from a wind turbine is an imprecise measure of noise, which is essential.

[121] In addition, he testified that the Case Definition overlooks the importance of assessing dose-response, "a fundamental principle in occupational and environmental medicine in evaluating causality".

[122] Dr. McCunney listed the six types of scientific studies that can be done, one of which is a case series. He notes that case series are not generally used to draw causal connections, citing the guidelines of the International Agency for Research on Cancer, an agency of the WHO.

[123] Dr. McCunney also notes that the Case Definition has not been validated.

[124] With respect to making any conclusions about the post-turbine witnesses, Dr. McCunney testified that he would have to do a physical exam and take a case history before making a diagnosis. He testified that, from his review of the existing literature, it has not been credibly established that wind turbines cause adverse health effects.

c. Noise Guidelines and set-back distances

Dr. Robert Thorne

[125] Dr. Thorne testified on behalf of the appellant with respect to noise. He was qualified as an expert in environmental health in relation to acoustics and psycho-acoustics. Acousticians measure sound, while psycho-acousticians assess human perception of sound, which they may perceive as noise.

[126] Dr. Thorne's opinion is that "individuals, when exposed to wind farm noise and wind turbine generated air pressure variations, will more likely than not be so affected there is serious harm to human health." Dr. Thorne refers to the WHO definition of health, which is "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."

[127] More specifically, he concludes that an outdoor environment characterised by fluctuating noise from wind turbines with sound levels 32 dB(A) or above, or an indoor environment characterised by fluctuating noise from wind turbines with sound levels 22 dB(A) or above, will more likely than not seriously harm individuals. Dr. Thorne's view is that, depending on room construction, there may be an additive effect inside such that the levels in some frequencies can actually be louder inside than outside.

[128] He had no criticisms of the Helimax Report with respect to the proposed Project. Rather, he agreed with a concluding observation by Dr. Leventhall in his witness

statement (who ultimately did not testify): “The problem is not what you hear, it is what you feel about what you hear”.

[129] Dr. Thorne’s opinion is that wind turbine noise is unique and has effects on some people at a lower decibel threshold than for other types of noise, such as general industrial, ventilation or transportation noise. Dr. Thorne testified that the characteristics of the sound produced by wind turbines, such as “whoosh” and “thump” as the blade passes the tower, or a “rumble thump” sounding “like a boot in the dryer” when the blades turn in the wind to re-align, can be described generically as “amplitude modulation”. He notes that modulation may be more pronounced in certain sound level bands. This is the sound, he suggests, that wakes people up at night. Dr. Thorne noted that there is not yet a good objective measure for the character of audible turbine sound.

[130] Dr. Thorne noted that Dr. Werner Richarz, who testified on behalf of the Approval Holder, agreed that amplitude modulation occurs in wind turbine sound, which he quantified at approximately 1% of the time. Dr. Thorne accepts the number of 1%.

[131] Dr. Thorne bases his opinion on a study he conducted in January 2012, in which he recorded noise levels and health effects at two wind farm locales in New Zealand and four wind farm locales in Australia. Dr. Thorne noted that the results of his study, which involved 23 subjects and 2 controls, “suggest that the individuals living near the wind farms of this study have a degraded Health-Related Quality of Life through annoyance and sleep disruption and that their health is significantly and seriously adversely affected (harmed) by noise.” He acknowledged that this was essentially a pilot study.

[132] Dr. Thorne testified that his working hypothesis is that “Adverse health effects are experienced by sensitive individuals due to modulating air pressure variations broadly measured in the 1 Hz to 80 Hz and 160 Hz third octave bands”.

[133] Dr. Thorne commented on the WHO Night-Time Noise Guidelines of 40 dB(A), in noting that they are guidelines only, and apply to all types of noise. Dr. Thorne believes wind turbine noise is more annoying due to its fluctuation.

[134] The Director argues that Dr. Thorne’s study should not be relied on, as it was too small to make any conclusions, the group was far too diverse, it was methodologically unsound, and there was no information as to the percentage of the general population that the subjects represented.

[135] The Director also argues that the sound attenuation from an average Canadian home, which according to Dr. Richarz ranges from 15-30 dB(A), would reduce the

indoor sound level to that recommended by Dr. Thorne [40 dB(A) outside would result in 10-25 dB(A) inside, after attenuation].

Dr. John Harrison

[136] Dr. John Harrison testified on behalf of APPEC in reply evidence. Dr. Harrison is a physicist who was qualified as an expert in physics with knowledge of acoustics, noise and sound.

[137] He reinforced Dr. Thorne's point regarding amplitude modulation. He testified that when turbines operate in a large wind speed gradient, the blade angle cannot be optimum for both the high wind speed at the top and the low wind speed at the bottom of the blade swept area; hence, the amplitude modulation is enhanced by 5-8 dB(A), and in extreme cases by up to 15 dB(A).

[138] Dr. Harrison disagreed with the testimony of Denton Miller on behalf of the Director, that the MOE uses conservative assumptions in its noise assessment. He pointed to the ground parameter and the margin of error used by the MOE as examples where the numbers were not conservative.

Dr. Warner Richarz

[139] Dr. Warner Richarz testified on behalf of the Approval Holder. He has a doctorate in aerospace engineering and was qualified as an expert in acoustics and the assessment of wind turbine noise.

[140] Dr. Richarz notes in his witness statement that "there is no doubt that high levels of sound pressure are detrimental to many aspects of our well-being." With respect to Dr. Thorne's evidence, he testified that there is no physical basis why a sound pressure level of 22 dB(A) indoors would impart the identical dose to a listener as 32 dB(A) outdoors.

[141] Dr. Richarz gave evidence that the sound levels likely to be experienced by the nearest residences to the Ostrander Point turbines will be well below 40 dB(A).

Tribunal findings on Sub-Issue 1 (Causation)

[142] The Tribunal finds that it cannot rely on the testimony of the post-turbine witnesses to make the link between their health complaints and the wind turbines. The reasons for this finding include:

- A finding that wind turbine noise causes harm to human health would be a medical conclusion. The panel has no medical expertise and must therefore rely on experts in the field (see *Kawartha Dairy, supra*).

- The Tribunal accepts the expert evidence by Doctors Baines, Moore and McCunney that subjective recall and reporting has been shown to be unreliable in scientific studies. The Tribunal observes that subjective reporting by the post-turbine witnesses of both onset or aggravation of symptoms, and association with turbine noise, was shown to be unreliable in this case on at least four occasions:
    - The MOE provided noise screening tests for one witness. It was established that, on 6 occasions out of 15 complaints to the turbine company of adverse health effects, the turbines were off;
    - Another witness sent a letter thanking the energy producer for turning off the turbines for three days, during which she had respite from adverse health effects. It was later confirmed the turbines were in operation those days;
    - Another witness testified to increased blood sugar levels after the turbines were activated, but the medical records demonstrate that the levels actually went down;
    - Another witness alleged that the turbines were causing him to suffer sleep disturbance, but a sleep study later demonstrated he had sleep apnea.
- The post-turbine witnesses' testimony was not accompanied by noise level measurements, such that the Tribunal could draw any conclusions as to whether they were experiencing symptoms at sound pressure levels below 40 dB(A), i.e., the Noise Guideline limits. For two witnesses, the MOE attended their homes pursuant to the 2011 Compliance Protocol and made noise measurements. However, the measurements proved inconclusive as to noise level limits, and require further testing.
- As would be required under Dr. McMurtry's proposed Case Definition, health care professionals have not ruled out other causes for the post-turbine witnesses' symptoms.

[143] With respect to the proposed Case Definition of AHE/IWTs, the Tribunal finds that it is a work in progress. It is a preliminary attempt to explain symptoms that appear to be suffered by people with whom Dr. McMurtry is familiar, who live in the environs of wind turbines. Dr. McMurtry's case definition has admittedly not been validated; thus there is currently no grouping of symptoms recognized by the medical profession as caused by wind turbines.

[144] Other drawbacks are: it is vague with respect to distance within which the effects may be felt, and there is no indication as to prevalence of symptoms within exposed individuals. There are additional weaknesses in its application, as health professionals have not ruled out other causes and no one has actually been diagnosed with anything.

[145] In conclusion, the Tribunal finds that, taking the post-turbine witnesses' testimony and all of the expert evidence and Dr. McMurtry's proposed Case Definition together, APPEC has not established that the alleged health effects are caused either by direct exposure to wind turbine noise, or indirectly through some other mechanism.

Sub-Issue 2: Whether engaging in the Ostrander Point project in accordance with the REA will cause serious harm to human health

[146] Section 145.2.1 of the *EPA* stipulates the Tribunal shall consider only whether engaging in the renewable energy project **in accordance with** the renewable energy approval will cause serious harm to human health.

[147] The Approval Holder and Director argue that the Project must comply with all the REA conditions which include regulated setbacks and the Noise Guideline, and as a result will not cause serious harm to human health. The appellant argues that the Project will cause serious harm to human health, despite complying with the regulated setbacks and Noise Guideline.

a. Noise Impact Assessment Report (Helimax report)

[148] Shant Dokouzian testified on behalf of the Approval Holder and presented the Noise Impact Assessment for Ostrander Point Wind Energy Park ("NIA"), of which he was a co-author, prepared by Helimax Energy Inc. and dated July 2010.

[149] Mr. Dokouzian is a civil engineer with the current position of Team Leader of Project Development Services for GL Garrad Hassan, "the world's largest renewable energy consultancy". At the time the NIA Report was written he was employed by Helimax, which was subsequently bought by GL Garrad Hassan. Mr. Dokouzian was recognized by the Tribunal as an expert in noise assessments for wind farms.

[150] There is no disagreement that the proposed project is in an area considered under the MOE's *Noise Guidelines for Wind Farms*, October 2008 ("Noise Guidelines") as Class 3, which is defined as a "rural area with an acoustical environment that is dominated by natural sounds having little or no road traffic". Under the Noise Guidelines, sound level limits for a Class 3 area vary according to the wind speed, as outlined in the following chart (Table 3-1 from the NIA, p.7):

		Wind Speed (m/s)				
		6	7	8	9	10
Class 3 Receptors	Wind Turbine Noise Criterion NPC-232 [dB(A)]	40	43	45	49	51

[151] Wind farm noise modeling is done using the international standard ISO 9613-2 as a model that propagates sound outdoors. Parameters are input into the computer model to attenuate sound in terms of distance, atmospheric and ground attenuation, and environmental effects.

[152] Under the MOE Noise Guidelines, a "point of reception" can be a permanent or seasonal resident, and includes vacant lots. The noise limits do not apply to participating receptors, which means properties under contract with the wind project. The precise definition is noted below.

[153] The noise modelling done by Helimax according to the ISO 9613 standard concludes that the noise produced by the turbines was within the acceptable limits for all identified Points of Reception for the Ostrander Point Project, within 1500 m of one or more turbines for wind speeds of 6, 7, 8, 9 and 10 m/s. These conclusions were not challenged.

[154] Counsel for the Approval Holder notes that some of the receptors identified are "vacant lots" or "seasonal residences". The Noise Guidelines draw no distinction between a vacant lot and a year-round residence, however, and the Tribunal has had no regard to the permanence of the receptors currently identified.

[155] "Camping grounds" are included in the Noise Guidelines as a receptor. It is acknowledged that this project proposal is entirely within the Ostrander Point Crown Land Block, and camping is permitted on Crown Land. This issue will be dealt with below, under "public safety".

b. Presenter Dr. Goddard-Hill

[156] Dr. Goddard-Hill was granted presenter status at the preliminary hearing in this matter, to give evidence on both portions of the appeal; impact on human health and on plant life, animal life or the natural environment. He is a family doctor living and working in the area, and was qualified on consent of the parties as an expert in family medicine.

[157] Dr. Goddard-Hill's presentation made the link between stress and sleep disturbance, to increased risk of drowsiness while driving, to the increased possibility of

fatal vehicle accidents due to the driver's lack of sleep. In this regard, he sought to show a causal link between serious harm to human health and turbine noise.

[158] Dr. Goddard-Hill's position is that it is not possible to make fully informed decisions regarding the risk posed by wind turbines, without the health studies that are currently underway. He therefore submitted that the Tribunal should deny the REA application on health grounds, until the health effects are understood.

c. APPEC evidence: Pre-turbine witnesses

[159] Two individuals who live in the environs of the proposed Ostrander Point Project testified in the proceeding. They were referred to as "pre-turbine witnesses". The couple lives in a converted turn-of-the-century barn, 2041 m from the closest proposed turbine. One individual (the "sensitive pre-turbine witness") suffers from vertigo and has highly sensitive hearing, which she has learned to manage over her lifetime by taking early action when she feels an attack of vertigo coming on. Both individuals expressed concern that the Project will seriously harm their health.

[160] The appellant argues that people residing within 5 km of the project will suffer serious harm to their health, and in this case the sensitive pre-turbine witness is likely to suffer serious harm as she has very sensitive hearing and suffers from vertigo.

[161] Dr. McMurtry testified that there are eight receptors of the Ostrander Point Project who share the same two common characteristics that the post-turbine witnesses share: (i) they reside within 2 kms of a wind turbine, and (ii) the turbine is rated in excess of 1.5 MW capacity. It is therefore his opinion that "it is more probable than not that there will be individuals who will suffer serious harm to their health due to their exposure to IWTs as a result of the Ostrander Point project operating as approved."

[162] Where this opinion is based on the post-turbine witnesses' evidence, however, the Tribunal cannot rely upon it, as noted above.

[163] Where Dr. McMurtry's opinion is based on his experience and literature reviews, the Tribunal must weigh it against the other expert evidence provided. The Tribunal in *Erickson* found that the scientific evidence currently does not support a finding that turbines cause harm to human health at a decibel level of 40 dB(A). While Dr. Thorne proposes that the unique noise signature of wind turbines may have an adverse health effect at levels less than 40 dB(A), and that A-weighted decibel rating may not be appropriate for this type of noise, the Tribunal finds his study to be preliminary and inconclusive. There was insufficient evidence filed before the Tribunal in this proceeding that would alter the conclusion reached in *Erickson*.

[164] With respect to the sensitive pre-turbine witness, there is simply insufficient reliable evidence before the Tribunal that people who live 2 km from a turbine, including individuals with sensitive hearing, will suffer serious harm to their health. Dr. McMurtry himself testified that he believes 2 km is a reasonable setback for current turbine technology, and the 5 km distance noted in the Case Definition is to allow for more powerful turbines that may come on line in the future. Dr. McMurtry also agrees a safe set-back distance depends on numerous variables, including the landscape, environmental conditions (wind speed and direction), number of turbines and their alignment, size and model of turbines, and the sensitivity of the individual.

[165] Nor has the appellant established who, out of the general population, will be sensitive to turbine noise, or how many people on average within the population will be sensitive. It is clear that not everyone is affected; Dr. McMurtry testified simply that "some will".

[166] As noted above, the Tribunal finds it cannot rely on the testimony of the post-turbine witnesses to establish causation of harm to human health in this case.

d. Harm to human health other than noise: Psychosomatic illnesses

[167] What emerges from a review of available literature, is that there is no conclusive evidence one way or the other as to what is causing health complaints from people who live in the environs of wind turbines.

[168] Workplace exposure studies and environmental health studies have shown that chronic exposures to high dB(A) levels, such as 70-80 dB(A), can negatively impact the otological system, such as loss of hearing, as noted by Dr. Richarz and Dr. McCunney.

[169] What is less clear is whether there are indirect health effects (i.e. caused by stress and/or sleep deprivation due to audible noise at night) at or below the noise threshold of 40 dB(A), and whether wind turbine sound exposure at or below 40 dB(A) may nonetheless cause psychosomatic health impacts for some individuals.

[170] The Director's submissions are that:

> It is the position of the Director that for an adverse health effect to be caused by a wind turbine, the turbine itself must cause a physiological effect. It is not enough that the sight of the turbine causes annoyance or that concerns regarding property values causes stress. If dislike or distrust were enough to meet the test set by s.145.2.1(2) of the EPA, that section would be rendered meaningless. It would also be impossible for the Director to issue an approval for any project, no matter the type, as subjective dislike would be enough to overturn the Director's decision.

[171] The Director argues that the Tribunal in *Chatham-Kent Wind Action Inc. v. Ontario (Director, MOE)*, [2012] O.E.R.T.D. No. 64 (*Chatham-Kent*) rejected such an

interpretation of the test, referring to paragraphs 56 and 59 in support. The Tribunal disagrees with the Director's interpretation of that case. In paragraph 56 of *Chatham-Kent* the Tribunal recounts the submissions of Mr. Ternoey, a self-represented participant in the proceedings. The Tribunal goes on, in paragraph 59, to find that Mr. Ternoey presented no evidence to support his submissions, and to reject them on that basis. The Tribunal did not turn its mind to the question of whether only physiological effects could be considered as adverse health effects.

[172] APPEC does not distinguish between physiological effects and psychosomatic health effects in the environs of wind turbines. It points to Dr. Leventhall's evidence in *Erickson*, in which he agreed that severe annoyance could lead to adverse health effects. Dr. McMurtry dismissed as archaic the distinction between psychological and physiological causes of adverse health effects.

[173] Dr. Baines referred to the recent study by researchers at the University of Auckland entitled "Can Expectations Produce Symptoms from Infrasound Associated with Wind Turbines?" (Crichton et al., (2013, March 11) *Health Psychology.* Advance online publication. Doi: 10.1037/a0031760). It compared symptom reports from healthy volunteers exposed to infrasound and sham infrasound, after being given information about the expected physiological effect of infrasound. They found that psychological expectations could explain the link between wind turbine exposure and health complaints. Another study, Chapman et el., noted above (pending peer review), concludes that "the reported spatio-temporal variations in complaints are consistent with psychogenic hypotheses that health problems arising are "communicated diseases" with nocebo effects likely to play an important role in the aetiology of complaints". The authors note that health complaints are much higher in areas where anti-wind activists are most vocal.

[174] The Tribunal acknowledges that these articles recognize the possibility that some health problems that arise in the vicinity of wind turbines could have psychological causes. The testimony of one post-turbine witness in particular raised the possibility of adverse health effects being related to mental health, which is another variation.

[175] The Tribunal accepts the witness' testimony as entirely credible; however, there are dangers inherent in attempting to draw general conclusions about "wind turbine effects" from anecdotal, personal and unique experiences. It is even more problematic to apply conclusions made from those unique personal circumstances at a certain location, to projects at other locations. Once a causal connection is established (which in this case it is not), one would need, for example, evidence that criteria have been

identified which would increase the risk among a certain percentage of the population of having a similar negative health effect. No such evidence was presented here.

Findings on Sub-issue 2 (Ostrander Point project)

[176] The individual experiences of post-turbine witnesses at other projects cannot be extrapolated in this case to conclude under s.145.2.1 of the *EPA* that engaging in the Ostrander Point Project in accordance with the REA will cause serious harm, because it has not been proven their health complaints were caused by turbines.

[177] As a result, the Tribunal finds that APPEC has not established that engaging in the renewable energy project in accordance with the renewable energy approval will cause serious harm to human health.

Crown land and public safety

[178] No parties addressed the issue of whether the fact that this Project is taking place on Crown land, which is publicly accessible, results in health or safety issues for occasional users of the Site. The Tribunal notes that there is effectively no setback for users of the Crown land for noise or other safety concerns.

[179] The issue of public safety was not raised in the Notice of Appeal. The Tribunal simply wishes to note its concern in this regard. The Tribunal's concern remains with respect to the lack of set-back for the safety of the public using the site. There is a 120 m set-back requirement from roads, for example, due to manufacturer specifications, which appears to have been waived by the MNR on behalf of the public.

Conclusion on Issue 1

[180] The evidence in this proceeding did not establish a causal link between wind turbines and either direct or indirect serious harm to human health at the 550 m set-back distance required under this REA.

[181] The evidence in this hearing did not establish that the Ostrander Point Project operating in accordance with the REA will cause serious harm to human health.

[182] For these reasons the Tribunal finds that the appellant has not established that engaging in the Project in accordance with the REA will cause serious harm to human health, and dismisses APPEC's appeal.

Issue 2: Whether engaging in the Project in accordance with the REA will cause serious and irreversible harm to plant life, animal life or the natural environment.

[183] Throughout this section, reference to "the appellant" is a reference to PECFN.

The Legal Test

[184] Under s. 145.2.1(3) of the *EPA*, PECFN has the onus of proving that engaging in the Project in accordance with the REA will cause serious and irreversible harm to plant life, animal life or the natural environment.

Previous decisions of the Tribunal

[185] Previous decisions of the Tribunal have considered some aspects of the second branch of the renewable energy approval test.

- An appellant is required to show such harm on the civil standard of a balance of probabilities. (*Erickson*, paras. 595 and 629; *Monture v. Ontario (Ministry of the Environment)*, (2012), 73 C.E.L.R. (3d) 87 ("*Monture 2"*), para. 31)
- Regarding the phrase "in accordance with" the terms of the REA, the Tribunal has held: "Any harm that may be caused by exceedances will not be relevant to the Tribunal's decision." (*Monture 1* at p. 21, 22)
- Evidence that only raises the potential for harm does not meet the onus of proof. (*Monture v. Ontario (Ministry of the Environment),* (2102) 68 C.E.L.R. (3d) 191 ("*Monture 1*"), para. 70; *Monture 2*, para. 31).
- "Will cause" must be proved on a balance of probabilities. (*Erickson*, paras. 595 and 629; *Monture 2*, para. 31)
- The Tribunal can consider whether both "direct" and "indirect" effects will be caused. (*Erickson*, para. 631; *Monture 2*, para. 31)
- The word "serious" should be interpreted in a way that suits both branches of the test (*Erickson*, para. 638; *Monture 2*, para. 31)

Serious and irreversible harm

[186] The phrase of the test that the parties focus on in their submissions is "serious and irreversible harm" Previous decisions of the Tribunal have not considered this phrase in depth, but have found that:

- the word “serious”, and the phrase “serious and irreversible”, must be interpreted on a case-by-case assessment according to all relevant factors. (*Erickson*, para. 638; *Monture 1*, para. 79; *Monture 2*, para. 31); and
- one bird or bat mortality will not always constitute “serious and irreversible harm to plant life, animal life or the natural environment”, but may be sufficient in certain circumstances. (*Monture 1*, paras. 71 and 80; *Monture 2*, para. 31)
- the test would be meaningless if it were to be interpreted to always be met or to never be met. (*Monture 1*, para 71)

[187] PECFN’s interpretation of the phrase is that “serious and irreversible harm will occur if it can be demonstrated that a single project will cause measurable declines of species that are already deemed at-risk, i.e., endangered, threatened or special concern.” In its final oral submissions, PECFN submits that there must be a measurable (i.e., significant) impact on a species that is in decline, and that a project will add to that harm.

[188] PECFN agrees with the Director’s submission (supported by the Approval Holder) that the second branch of the test should be interpreted using an “ecosystem approach”, and additionally submits: “that ‘plant life’ and ‘animal life’ warrant broad interpretations such that the focus must be on the overall environment.”

[189] The Director submits:

> The ordinary meaning of the words “animal life” and “plant life” connote an ecosystem approach. The terms “plant life” and “animal life” are akin to the terms “flora” and “fauna”. In fact, the Canadian Oxford Dictionary defines fauna as “the animal life of a particular region, geological period or environment”. Similarly, the Dictionary of Environmental Law and Science defines fauna as “animal life”. As for flora, it is defined as “the plants or plant life of a given area, habitat or epoch” by the Shorter Oxford English Dictionary.

[190] The Director interprets the phrase “serious and irreversible harm” in the test “to signify a population level impact to plant life or animal life.” However, the Director’s interpretation, cited below, also incorporates aspects of PECFN’s “diminishing species” interpretation (emphasis added):

> Given the different vulnerabilities of various species, the amount of mortality that would result in a population level impact will vary from species to species and from site to site. Potential impacts must therefore be evaluated on a case-by-case basis and will depend on factors such as the degree to which a species’ population is threatened, <u>the vulnerability of a species, the dispersal of the population, the availability of habitat</u>, the extent of harm caused by the project and the use of avoidance or mitigation measures to reduce this impact.

[191] The Director submits that its witness Ms. McGuiness, and the Approval Holder's witnesses Dr. Kerlinger and Dr. Strickland, testified that serious and irreversible harm should be assessed: "in terms of impacts on the regional population of a species" and that:

> the geographic range of a regional population can vary considerably, depending on the species. A population of a migratory birds species, for example, will generally be spread over a much larger geographic area than the regional population of a less mobile species, such as Blanding's turtles.

[192] The Approval Holder adopts the Director's submissions (first made by the Director in *Monture 1*, and repeated by the Director in this case), that "the Legislature chose the words 'animal life' and 'plant life' which connote an ecosystem approach" and "the focus of the *EPA* is the overall environment and not the protection of an individual plant or animal**.**"

[193] The Approval Holder submits that "serious and irreversible harm requires significant harm that causes a biologically significant and irrecoverable decline in the population of the species at issue." The Approval Holder expands on this interpretation saying (emphasis in the original): "Collectively, these criteria require that harm be suffered by plant life, animal life or the natural environment that *remains* serious even *after* all available restoration or recovery through human effort or natural processes."

[194] The Approval Holder argues that the scope of the enquiry is whether there is any residual, "unmitigated" harm (emphasis in the original):

> … we submit that harm will <u>only</u> be [*sic*] characterized as "irreversible" if it is beyond the power of human effort (or natural processes) to correct or undo the resulting "serious" damage. More specifically -- given that the statutory appeal test in s-s. 145.2.1(2)(b) is only satisfied by harm that is both "serious" and "irreversible" -- we submit that the test will only be met if -- *after* all human efforts and all natural recovery have occurred -- the remaining (unmitigated) harm continues to be properly characterized as "serious". …

[195] The Approval Holder submits that the MNR Bird and Bat Guidelines, and a document entitled "Assessing Significance of Impacts from Onshore Windfarms on Birds Outwith Designated Areas by Scottish Natural Heritage" (the "Scottish Document") provide helpful guidance to the meaning of the phrase "serious and irreversible harm".

[196] Regarding the MNR Guideline, the Approval Holder argues that mortality rates falling at or below the guideline levels cannot constitute "serious and irreversible harm." The Approval Holder argues that PECFN's "measureable" qualification to the "diminishing species" interpretation does not equate with "serious and irreversible".

[197] The Approval Holder submits that the Scottish Document provides guidance on the interpretation of the phrase "serious and irreversible harm" and accords with the "population viability" interpretation. The Scottish Document is used by Scottish National Heritage ("SNH") to assess whether impacts of wind farms on birds in Scotland should be considered sufficiently significant to be of concern. However, the Approval Holder, and the Scottish Document itself, say that its principles are generally applicable to other development in a rural area, and may apply to other species. One of its principles is as follows:

> To assess the significance of a windfarm on a bird species, information should be available regarding the impact on the species in terms of added mortality, any loss of habitat and nesting or feeding territory, and any expected loss in the population. These impacts should be placed in context through information addressing the total population number and distribution (where known), current annual mortality, and the area of suitable habitat for the species in the region. Where a PVA [Population Viability Analysis] analysis has been possible, the predicted impacts of added mortality should be interpreted in terms of its likely and possible effects on the species population.

[198] The Approval Holder argues that PECFN's expert witnesses did not undertake the above type of population viability assessment.

[199] In reply, PECFN submits that the "population viability" interpretation sets the bar so high that the second branch of the test would be meaningless because no appellant could ever satisfy the test. PECFN argues that the test would become a licence for wind projects to cause fatalities at very high levels, to every species, because there would never be measureable population effects.

[200] PECFN further argues that a simple and inclusive interpretation is preferable and that a case-by-case (in the sense of every species) analysis of the test would take too long in the context of the very short time frame for REA appeal hearings, and be very expensive and, therefore, too onerous for appellants. PECFN argues that its interpretation is more practical and effective. In short, PECFN argues, if there is a species already in decline a wind project should not be allowed to go forward if it will add to the decline. PECFN further argues that the *ESA* permit process is not the solution for species in decline because it is has a different purpose and different process. In this case, the MNR required *ESA* permits for Blanding's turtle and Whip-poor-will.

[201] PECFN further argues that the "population viability" interpretation does not distinguish between common plants and animals with large populations and species at risk. In previous cases the Tribunal has found that the test would be rendered meaningless if the death of one bird or bat due to the operation of a renewable energy

project is always “serious and irreversible” harm (although there might be situations where that can be demonstrated). PECFN argues that the “population viability” interpretation of “serious and irreversible harm” would be equally meaningless.

[202] The Appellant’s experts went to great lengths to demonstrate the measurable impacts the Project will have on the alvar ecosystem, birds, Blanding’s turtles, bats and Monarch butterflies. One way or another they all agreed that wind turbines should not be sited at Ostrander Point, an environmentally unique and valuable site for numerous species at risk. The evidence clearly demonstrates that numerous species at risk will, more likely than not, see further declines as a direct result of this Project. Consequently, it should not proceed.

Conclusion on the legal test

[203] The Tribunal sees merit in some aspects of the interpretations of the phrase “serious and irreversible harm” by each of the parties, but also agrees with some of their mutual criticisms. Consistent with previous decisions, the Tribunal finds that the second branch of the test would be rendered meaningless if it will always be satisfied or because it would be impossibly high to meet. In this case, the Tribunal finds PECFN’s “declining species” interpretation of the phrase “serious and irreversible harm” is too broad, and the “population viability” interpretation of the Director and the Approval Holder, when used for all species, is too restrictive.

[204] The one principle all of the parties advocate is an “ecosystem approach”. The Tribunal agrees with their submissions on this point. The ecosystem approach reflects the plain language and purpose of the *EPA*, to provide for the protection of the natural environment. It is also reflected in s. 47.2(1) of the *EPA*, which is relevant to “Renewable Energy”, and provides that “[t]he purpose of this Part [Part V.0.1 “Renewable Energy”] is to provide for the protection and conservation of the environment.”

[205] The *ESA* provides, in s.13, that a recovery strategy or management plan for endangered or threatened species may be prepared using an ecosystem approach. A recovery strategy for endangered of threatened species shall include identification of the habitat needs of the species and recommendation to the minister on the area that prescribes an area as the habitat of the species.

[206] Consistent with earlier REA cases, the Tribunal finds that, in determining serious and irreversible harm to plant life, animal life or the natural environment, the relevant factors, and their respective importance and weight, must be assessed on a case by case basis.

[207] The factors that have assisted the Tribunal's consideration of the second branch of the test in this case are discussed in these reasons in relation to each section on plant life and animal life. The factors discussed are not all-inclusive.

[208] For example, when dealing with plant life, animal life or a feature of the natural environment that has been identified as being at risk, a decline in the population or habitat of the species, or the alteration or destruction of such feature, will generally be factors with considerable weight when considering "serious and irreversible harm" and applying the test.

[209] For plant life, animal life or a feature of the natural environment that has not been identified as being at risk, then the analysis would require greater preliminary consideration of such factors as the degree to which a species' population is threatened, the vulnerability of a species, the dispersal of the species' population, and the quantity and quality of habitat.

Arguments of Participants and Presenters

[210] Mr. Dubin was given presenter status on March 1, 2013 during a preliminary hearing in this matter. He asked to be qualified to give expert opinion evidence on the environmental impact assessment ("EIA") process. The Director and Approval Holder objected to Mr. Dubin being qualified as an expert. As noted above, a telephone conference call was held and the parties were able to cross examine Mr. Dubin on his qualifications. The connection was broken, however, before Mr. Dubin could give his presentation. As a result, the Tribunal made a ruling on expertise and then received Mr. Dubin's written presentation, filed earlier, as his evidence.

[211] The Tribunal recognized Mr. Dubin as an expert in the EIA process on April 25, 2013, due to his extensive experience performing environmental assessments in Hong Kong and China, experience with the Canadian, Federal Environment Assessment process, and relevant experience in assessing the environmental impact assessment process in Ontario. It was recognized that he does not have experience in the specific area of wind farm impacts, nor has he referred to his having personal knowledge regarding the site for this project, but he has had recent involvement in pro bono and advisory work in environment and sustainability with local government in Kingston, Ontario. The Tribunal's oral ruling in this regard is attached as Appendix J

[212] The Tribunal is not engaged in reviewing the EIA process, in a REA appeal. In that regard, issues relating to whether the EIA process was properly followed are outside the jurisdiction of the Tribunal.

[213] Mr. Dubin's presentation includes a number of points that are relevant, however, to the question of the Project's impact on Blanding's turtle, on bird populations, and on the ecosystem components at Ostrander Point. In particular, Mr. Dubin explains that he objects to the Ostrander Point Project due to its location in an IBA; within a candidate ANSI which, he stated, if confirmed would prohibit the development; technical issues related to the EIS Report; the site would not fit Federal Environment Canada site selection criteria or recent siting guidelines by the Nature Conservancy; concerns with draft versions of the EIS Report; under Federal EA Requirements the public concerns expressed would require that the Project be taken to review or mediation; and Federal EA procedures include a requirement for a cumulative impact assessment.

[214] The Tribunal has considered this evidence along with the evidence discussed under each of the relevant parts below.

[215] Dr. Goddard-Hill made a presentation supporting both APPEC and PECFN in their appeals of the proposed Project. His comments on health effects are noted above. Dr. Goddard-Hill lives in Prince Edward County, has an interest in ornithology and started his own public interest research group, the Eastern Lake Ontario Environmental Research Group, in 2000.

[216] Dr. Goddard-Hill commented on the global phenomenon of declining bird populations. He noted the complexities of ecosystems, and the fact that each animal death is a loss of genetic material, which at some point becomes critical for survival of a population. He commented on the importance of Prince Edward Point to bird migrations, and noted from personal experience that many renowned birders value the site.

[217] Parker Gallant spoke on behalf of the participant Wind Concerns Ontario (WCO), which supports PECFN's appeal. WCO brought a number of concerns to the Tribunal's attention regarding danger that wind turbines present to bats. The presentation criticised various elements of Stantec's Bat Report, as well as the MNR's Bat Guidelines. WCO described its concerns related to development in or close to wetlands at the Project Site, and noted that, according to its information, Quinte Region Conservation Authority has not been contacted by the MOE or the MNR with respect to the REA and wetland issues.

[218] Don Chisholm made a presentation in support of the Project. He presented material to put the need for green energy in a global context. He compared the diminishing "energy return on investment" of traditional oil and gas production with renewable energy, which he stated has a much better future. Mr. Chisholm emphasized the high environmental cost of oil and gas production and consumption.

[219] Deborah Hudson also made a presentation in support of the Project. She spoke about the history of the Prince Edward County South Shore, and Ostrander Point Crown Land Block, describing both agricultural uses and as an artillery or bombing range by the military.

Sub-Issue 1: Whether engaging in the Project in accordance with the REA will cause serious and irreversible harm to animal life

Blanding's turtle

1. Overview

[220] The Site has been identified as habitat for Blanding's turtle, a threatened species in Ontario. One of the most serious threats to Blanding's turtle is road mortality. The appellant argues that the construction and improvement of roads in the Ostrander Point Crown Land Block will increase traffic to the area, both project-related and by the public, and increase nest predation and poaching. As a result the Project will cause serious and irreversible harm to this vulnerable species. The Director and the Approval Holder argue that any negative impact the Project might have on Blanding's turtle will be successfully mitigated through the *ESA* Permit conditions, such that there is no serious and irreversible harm. They argue that the *ESA* Permit issued by the MNR ensures that the Project will result in a net benefit for the species.

[221] On this issue, the following experts were called: Dr Frederic Beaudry, Kari Gunson, Dr. Christopher Edge, and Dr. Fraser Shilling.

[222] Dr. Beaudry was qualified as an expert in Blanding's turtle. He is an Assistant Professor of Environmental Science at Alfred University, New York. He holds a Ph.D. in wildlife ecology from the University of Maine.

[223] Ms. Gunson was qualified to give expert opinion on the impacts of roads on wildlife. She is the principal of Eco-Kare International and the primary road ecologist consultant with the Ontario Road Ecology Group.

[224] Dr. Edge was qualified as an expert on Blanding's turtle. He received his Ph.D. in biology at the University of New Brunswick in 2012 and is currently doing post-doctoral research at the University of Alabama on the effects of herbicides on wetlands. Dr. Edge radio-tracked turtles for two years in 2006 and 2007 in Algonquin Park as part of his Master's degree.

[225] Dr. Shilling was qualified as an expert in assessing the impacts of roads on wildlife and ecosystems. He holds a Ph.D. from the University of Southern California in aquatic ecology. He directs the UC Davis Road Ecology Center.

[226] In addition, Andrew Taylor, an employee of Stantec, spoke to the Stantec Report filed in support of the REA application. The MOE called no experts on turtles. Melissa LaPlante testified, an MNR biologist who was qualified as an expert in "reviewing impacts of proposed projects on species at risk", as well as Andy Baxter, an MNR employee, who spoke as a fact witness with respect to the process involved in obtaining an *ESA* Permit.

2. Whether Blanding's turtle is properly an issue before the Tribunal

[227] As was the case with alvar, the Approval Holder argues that PECFN did not include harm to turtles as a ground of appeal, and therefore the Tribunal should disregard these portions of the appeal under Rule 28 of the Tribunal's Rules of Practice. In the alternative, the Approval Holder asks for an order for costs to "compensate the Approval Holder for the necessity of responding to these new issues without adequate notice".

[228] The objection to inclusion of this issue was raised only at the closing submissions stage. In this regard, the same reasons cited in the Alvar section of these reasons apply to the Tribunal's finding that Blanding's turtle is also an appropriate issue before the Tribunal.

[229] Under the heading "Indirect effects – Habitat loss" at paragraph 18, the Notice of Appeal mentions turtles as one of a list of species with habitat on the Site, and for which "the Project will cause serious indirect harm that cannot be reversed."

[230] The Approval Holder was well aware that Blanding's turtle was a species of concern on the Site, given that it had done specific reports for the MNR on this species and was required to obtain a permit under the *ESA*.

[231] PECFN listed Kari Gunson as an expert witness on its original list of witnesses, filed on February 20, 2013. She directly addresses Blanding's turtle and Whip-poor-will in her witness statement.

[232] Dr. Frederic Beaudry, an expert in Blanding's turtle, was not originally on PECFN's list of intended witnesses. A report that Dr. Beaudry had prepared, "Comments on the Effects of the Proposed Ostrander Point Wind Energy Park on a Blanding's turtle Population" (dated September 15, 2011), had been attached to a presentation filed on February 22, 2013 with the Tribunal by Ian Dubin, a presenter in this proceeding. On March 6, 2013, the Approval Holder noted its objection to Mr. Dubin relying on the report. Mr. Dubin testified via teleconference on March 7, 2013 because he was in Hong Kong and unable to attend the hearing. The teleconference was cut short before the fate of the reports was discussed. PECFN informed the other

parties on Monday, March 11, 2013 of its intention to call Dr. Beaudry as a witness, as it appeared he would not be called by Mr. Dubin. Since the request to add a new expert witness was opposed, PECFN made a motion to the Tribunal to add Dr. Beaudry as a witness in its case on March 18, 2013. The Director and the Approval Holder argued that they had already structured their case to reply to the witnesses on the list, and it would create prejudice to have to deal with a new witness once the case had already begun. There were also concerns regarding the available hearing time under the REA process. However, the Approval Holder did not object to the issue of Blanding's turtle as an appropriate issue in the hearing.

[233] The Tribunal ruled on March 18, 2013 that Dr. Beaudry could be called by PECFN as an additional expert witness. A second additional expert, Mr. Smith, was not permitted. The Tribunal's ruling is attached as Appendix K.

[234] The Tribunal finds that PECFN raised the issue of habitat loss to "land-based populations i.e., turtles and snakes" in its Notice of Appeal, which was sufficient to include Blanding's turtle. All parties had notice of the specifics of the habitat loss allegations and prior notice of the report Dr. Beaudry intended to rely upon. There was no prejudice to any party and the Tribunal dismissed the Approval Holder's request to disregard this portion of the appeal.

3. Conservation status

[235] The following overview information is not contested.

[236] Seven of Ontario's eight native turtle species are threatened, endangered or of special concern.

[237] Blanding's turtle is ranked S3 (vulnerable) in Ontario and is currently designated as a Threatened species on Schedule 1 of Ontario's *ESA* and the federal *Species at Risk Act* (2002). The Nova Scotia population of Blanding's turtle is listed as Endangered.

[238] The *Blanding's Turtle Habitat Assessment, Draft for Discussion* dated October 2009 by Stantec Consulting Ltd. (the "Stantec Report"), which was prepared as part of the NHA/EIS, notes that for reptile species on provincially-owned Crown land, only the provincial *ESA* applies which prohibits the killing, harming, harassing or capturing of Blanding's turtle. Habitat regulations are not yet in effect and need to be finalized in order for the damage or destruction of Blanding's turtle habitat to be prohibited.

[239] At the time the Stantec Report was written, Blanding's turtle was listed as "G4", which is "common". However, the International Union for Conservation of Nature (part

of the United Nations Environment Program) revised the status of Blanding's turtle in 2011 to Endangered for the entire species.

[240] The population of Blanding's turtle in Ontario, and at the Site, is not known. There are historic sightings throughout Prince Edward County, and a number of sightings by Stantec during its investigations from 2007 to 2009. Subsequent surveys on the subject property for the Ostrander Point Project have confirmed that the species is present.

4. Blanding's turtle biology

[241] The following information is not contested.

[242] Blanding's turtle is a semi-aquatic turtle that only occurs in northeastern and Midwestern North America, occupying a disjunct range with distinct populations in New England, New York, and Nova Scotia. Within Ontario, the species is spottily distributed in the southern and central portions of the province.

[243] Blanding's turtle uses a variety of wetland types depending on availability, including emergent mashes, bogs, forested swamps, and temporary pools. Habitat use is generally driven by needs such as food, summer refuges from dry periods, and in winter protection from freezing temperatures. In some areas a single large wetland could accommodate all of those needs, but in most places Blanding's turtle uses several wetlands over the year, requiring overland trips.

[244] In early summer, nesting females seek an appropriate site for egg laying with an exposure to direct sunlight. Such sites include beaches, grasslands, rocky outcrops, agricultural fields, road and railway embankments, lawns, forest cuts, dredge piles, and borrow pits. Blanding's turtles have been found to move extensively overland to nesting sites – movements up to 6km have been reported.

[245] The population ecology of Blanding's turtle is dominated by a reproductive strategy where a limited yearly reproductive output is offset by a very long breeding history. Females do not reach sexual maturity before 18-20 years, and not every mature female reproduces every year-- the breeding interval being 1.5 years on average. The clutch size is 10-14 eggs, and females do not nest more than once within a breeding season. Nest success is variable, but generally low due to predators.

[246] The period where hatchlings make their way from the nest to a wetland is a very high risk period in terms of predation due to their small size. Once in the wetland, it takes the turtle five to seven years to grow beyond "gape" size. These life history traits mean that there is very little chance that a single egg will make it to a breeding turtle.

[247] In order for the species to persist, its low annual reproductive output needs to be repeated over decades of breeding opportunities. The life-span is over 70 years.

[248] Turtles move slowly when crossing a road, and their reaction to a threat is to hide in their shell, rather than flee.

[249] In addition, Blanding's turtle is attractive and good-natured, making it a highly desired pet and target of poaching; a threat that is increased with easier access to habitat.

5. Project impacts on Blanding's turtle

a. Road impacts

[250] Currently the Site contains several kilometers of tertiary road that is only passable with four wheel drive vehicles and all-terrain vehicles. The Project requires that 5.4 km of roadway be created.

[251] There was consensus among the experts that the major source of anthropogenic mortality to Blanding's turtle is road impacts: animals struck and killed on roadways while travelling among wetlands; when females travel overland to reach nesting sites; and when females nest in the shoulders of roads. Other threats caused by roads include increased poaching and predation.

[252] There was agreement among the experts that Blanding's turtle inhabits the Ostrander Point Site and adjacent areas, and there is suitable habitat on the Site for all life stages (nesting, the activity period, and overwintering).

[253] Suitable nesting sites include any region with sandy or gravel substrate, minimal canopy cover, and little grass cover. Dr. Christopher Edge, who testified as an expert witness on behalf of the Approval Holder, testified that such habitat could be found throughout the study site, and all roadways within 200 m of a wetland should be considered nesting habitat. Dr. Edge stated that in addition to the roadways, there was additional nesting habitat throughout the region, specifically in the northeast section of the property.

[254] Seasonally wet areas are used during the activity season. They are important for foraging because temporary wetlands do not have fish and thus are a good source of tadpoles and frog and salamander larvae. The southern area of the Project Site in particular contains a large number of seasonally wet areas.

[255] In the late summer (late August and early September) Blanding's turtles will return to the permanent wetlands that they use for overwintering. Dr. Edge said that suitable habitat for overwintering occurred in wetlands MAS2-4 and SWD2-2a, in the

south eastern corner of the subject property, as well as wetlands to the east, to the west, and to the north of the Ostrander Point Crown Land Block. A suitable overwintering wetland is deep enough that the turtle can stay below the ice.

[256] The Stantec Report acknowledges that the number of Blanding's turtles on the Project Site is not known, but concludes at p. 4.1 that "Prince Edward County appears to support **numerous populations** of Blanding's turtles." (emphasis added)

[257] Dr. Edge described the Project Site as similar to the lands surrounding it: "The area on the southern shore of Lake Ontario here in Prince Edward County is what I would describe as homogeneous matrix of various wetland types both permanent and temporary, so the whole shore is suitable habitat for Blanding's turtles".

[258] Dr. Edge added that there appeared to be one permanent wetland very close to Babylon Road on the "compensation property" (described further below), and two coastal marshes, in the southeast and southwest of the Project Site. In his opinion, turtles likely overwinter in wetlands on site and travel off site during the active season to nest, and turtles that overwinter off site may travel on site to nest. He opined that no habitat type on the subject property appears to be limiting or rare at the scale of the subject property or the area surrounding the subject property. He added that there were additional temporary wetlands north of the proposed road on the southern extent of the site, not identified in the Stantec Report.

[259] The Stantec Report recognizes that, "as the Project will be situated in currently undisturbed areas", the following are "potential indirect disturbance effects to Blanding's turtles from the turbines or an increase in human activity":

- Increased risk of mortality on new access roads, which may experience an increase in traffic over current conditions
- Increased predation of nests due to predators (i.e., coyotes and foxes) using access roads to traverse through the habitat
- Increased poaching for the pet trade due to increased access and awareness of the local Blanding's turtle population

[260] Dr. Beaudry's specific concern with the construction of roads on the Ostrander Point Site is that, while they would not merely be "close to" Blanding's turtle habitat, they would be right **in** the habitat. A single turtle would undertake several road crossings in its annual cycle.

[261] Dr. Beaudry stated that the use of roads as travel corridors for medium-sized predators such as skunks and raccoons should not be minimized. Roads increase nest

predation, and make the rest of the study area more available to predators. In addition, predators are "subsidized" and encouraged follow the roads when they find road kill and food scraps.

[262] Ms. Gunson referred to a study by D. Seburn, "Recovery Strategy for Species at Risk in Ontario: Draft Report for the Ontario Multi-species Turtles at Risk Recovery Team" (2007), which identifies road mortality as a threat of urgent priority for 5 of Ontario's 8 turtle species and had contributed to local population declines and extirpation throughout the province. Ms. Gunson relied on a study by J. Congdon et al. in concluding that any acute or sudden increase in adult mortality (e.g., from road-kill) would likely result in population decline. She added that recovery of turtle populations from an increase in adult mortality was slow.

[263] In her opinion, the manifold effects of roads extend far beyond road-kill caused by vehicles. She referred to studies which found that roads and their ensuing vehicle use and increased human activity also harm wildlife indirectly, including landscape fragmentation and alteration of physical conditions (e.g., light, heat, vibration, chemical) and plant composition in their vicinity. Joyal et al.'s study indicates that in order for small populations of Blanding's turtles to remain viable they required large areas of suitable intact habitat to complete both their aquatic and terrestrial life history.

[264] Ms. Gunson opined that the development of access roads separating Blanding's turtle overwintering habitat from upland terrestrial habitat combined with the increased risk of road-killed adults would cause serious and irreversible harm to these populations of animals.

b. ESA Permit and Required Mitigation Measures

[265] The Approval Holder was required to consider potential impacts on species at risk pursuant to the *Endangered Species Act* ("*ESA")*. This process is completely separate from the renewable energy approval process and falls outside of the MOE's jurisdiction. The Stantec Report was prepared as part of this process, and is appended to the NHA/EIS.

[266] While the Environmental Effects Monitoring Plan ("EEMP") requires the Approval Holder to notify the MNR of any and all mortality of species at risk within 24 hours of observation or the next business day, there are no requirements specific to Blanding's turtle in the EEMP.

[267] Melissa Laplante, an MNR employee, was qualified as an expert in reviewing impacts of proposed projects on species at risk. She is not an expert in the Blanding's turtle. Ms. Laplante testified that, if surveys determine that a species is present on site,

the impacts of the project are then considered to determine if there will be any negative impacts to either the species or the habitat. If it is determined that there is a high likelihood that negative impacts cannot be avoided, the MNR recommends that the proponent apply for apermit under s.17(2)(c) of the *ESA.*

[268] An *ESA* Permit is an exemption from the general prohibition on killing, harming or harassing of a single member of an endangered or threatened species and/or the prohibition on damaging the habitat of an endangered or threatened species. In the case of the Project, an *ESA* Permit was required for Blanding's turtle and Whip-poor-will bird species.

[269] Andy Baxter, an MNR employee, testified that a permit under the *ESA* is issued after consideration of several factors, including: alternatives; steps to minimize the impacts; the actions through the permit must achieve an "overall benefit" for the species; and the Government Response Statement for the species must be considered. According to Mr. Baxter, "overall benefit" means that **the species as a whole in Ontario** has to be better off as a result of the project than it was prior to the permit being issued. The consideration of "alternatives" was limited to alternatives within the Project area, and did not include a consideration of alternative sites for the proposed Project.

[270] A summary of the mitigation measures for Blanding's turtle that are required in the *ESA* Permit, is as follows:

- Develop an Impact Monitoring Plan prior to the commencement of construction activities. Minimum elements to be included: (a) ensure Site restoration and mitigation measures are installed and functioning properly; (b) identification of "high frequency intersects" leading to mitigation measures such as relocation of signage / underground passage / modified culvert constructed, through adaptive management; and (c) monitor species mortality.
- Ostrander Point shall not undertake any construction activities, any vegetation clearing, or road maintenance on the Site from May 1 to October 15 of any year.
- If a Blanding's turtle or nest site is found on the Site during construction, to cease construction until certain precautions are taken.
- Speed bumps shall be installed and maintained.
- No road maintenance involving chemical spraying.
- Training of staff and contractors with respect to Blanding's turtle.
- Education signage at the Site regarding possible presence of species at risk.

- Speed limits.
- Strategic creation of nesting habitat on the eastern side of the Site located within 250 m of wetland habitat and at least 400 m away from the Project access roads, for the duration of the *ESA* Permit. Nesting habitat will be monitored annually and subject to reporting requirements.
- Turtle crossing signs.
- 37.65 ha property, outside the Project Site, to be set aside to provide, restore and actively maintain habitat for Blanding's turtle (known as the "Property"), subject to a 20 year conservation easement.
- The Property shall be maintained in its current state until the MNR approves a Property Management Plan.
- General monitoring for Blanding's turtle during construction.
- Impact monitoring for Blanding's turtle during construction.
- Species Encounter Report summary twice a year, and annual report.

[271] Under the *ESA* Permit, the Approval Holder is required to create enhanced habitat for both Blanding's turtle and Whip-poor-will on the 37.64 ha compensation property, located to the north of Helmer Road.

c. Expert opinions on mitigation measures

[272] The expert witnesses reviewed the *ESA* Permit requirements and the NHA/EIS and EEMP commitments, and disagreed on their effectiveness.

[273] Dr. Edge and Dr. Shilling opined that the mitigation measures will be effective to decrease the chance of adult Blanding's turtle mortality. Dr. Beaudry and Ms. Gunson opined that the mitigation measures have not been proven to be effective, and although certain measures may reduce turtle mortality, they will not prevent serious and irreversible harm to Blanding's turtle at Ostrander Point.

Dr. Beaudry

[274] Dr. Beaudry described a "population" as a group of intermingling individuals that could potentially breed with each other. In his view, the population at the Project Site is small, due to the fact the project area is small, and Blanding's turtle does not occur densely. He would include turtles on adjacent properties as part of the same population, although he is not able to state how far the population extends off site. The term "population segment" refers to separate populations based on a geographic distribution. In North America, there are four distinct population segments: Great Lakes (including Ostrander Point), North East (including New England), New York, and Nova Scotia.

[275] Dr. Beaudry testified that the spatial arrangement of the proposed roads triggered a serious concern for him, given that the roads are in the middle of a network of wetlands. This is a different situation from a location where the turtles may stumble upon a road in the course of their extensive overland movements; on this site, he testified, the likelihood that these turtles will cross a road is extremely high, multiple times in their annual cycle. In his view, the whole of Ostrander Point Crown Land Block is "critical habitat" for Blanding's turtle, in that it is all used for its life functions.

[276] The mitigation measures do nothing to reduce increased nest predation or poaching.

[277] Dr. Beaudry acknowledged that driver training and speed limits may be effective for drivers affiliated with the project, but will not be effective for the general public. In his experience, speed limits are only as good as their enforcement. He testified that he was aware of only one study on the effectiveness of signs. It showed that signs were only marginally effective at slowing down drivers when accompanied by a lower speed limit and fashing lights, but the lower speed did not translate into fewer wildlife collisions.

[278] He testified that culverts can be a good approach to maintain connectivity for frogs, salamanders and some turtles, but they do not work for Blanding's turtle. The construction of culverts assumes the precise location where the turtles will cross the road. Dr. Beaudry has done extensive work around the concept of finding hot spots where turtles will cross roads, and has published more peer-reviewed articles than anyone on Blanding's turtle. His studies have concluded that Blanding's turtles do not travel in a straight line from wetland to wetland, but travel in sweeping arcs and do not follow the same route each time. As a result, where there is a road between wetlands, the road segment where the turtles will cross is uncertain and may vary by up to 1500 m. He therefore does not believe that culverts, tunnels, or grade passage will be effective for Blanding's turtle at the Project Site.

[279] Dr. Beaudry explains in his witness statement why he believes the compensation property will not prevent serious and irreversible harm:

> This measure [the protection of a nearby site] certainly could prevent further development in the area and have a positive effect on the rare alvar vegetation communities, or on the resident amphibian communities. However, if Blanding's turtles do not occur at the off-site location currently, it is unlikely that they will move there on their own accord and abandon the wind farm site; mortality risks would remain high. Translocations, especially to a nearby site, are a complex and risky endeavor that in my opinion is unlikely to have any success. And in the event there already are Blanding's turtles at the proposed off-site mitigation area, the ultimate goal when protecting it becomes hazy.

> Activities leading to the harm or killing of Blanding's turtles, as well as damage or destruction to their habitat, are already prohibited under the Ontario Endangered Species Act. Therefore it would not be clear what benefit additional protection would bring, and the proposed project would still result in a net loss of turtles and probably of a local population.

[280] Dr. Beaudry testified that the only mitigation measure that would work at the Ostrander Point Crown Land Block is preventing the serious and irreversible harm by not building the roads. He acknowledged in cross-examination that he had written an article recommending temporary signs, speed reduction and temporary road closures at "hot moments" in the year, when Blanding's turtle is most vulnerable, but stated that he had made that recommendation in the context of a location where roads had been in existence since colonial times, it was "all we could do", and his advice related to maximizing the limited mitigation measures available.

Kari Gunson

[281] Ms. Gunson testified that road effects on turtles are both direct, due to being hit by vehicles, and indirect through habitat loss and fragmentation, changes to vegetation, and changes to hydrology.

[282] Ms. Gunson testified that the use of signage, speed bumps, driver training, and reduced speed limits were not proven to reduce the risk of adult turtle mortality. Those mitigation measures are grouped in a similar category in that the onus and effectiveness of each of these mitigation measures depends on the responsibility and awareness of the motorist. Studies recommend keeping turtles off roads, rather than relying on motorist responsibility; studies show that some motorists intentionally run over turtles. She did acknowledge that some motorists stop to assist turtles when they see them on the road.

[283] Ms. Gunson stated that there was no direct correlation between traffic volume or speed, and traffic mortality. She added that there was no linear relationship with regard to turtles.

[284] With regard to turtle crossing signs, Ms. Gunson agreed that there had not been any before and after effectiveness studies to test whether turtle crossing signs were effective. She added that driver habituation was a problem and, in her expert opinion, the signs were not an effective tool to negate enough adult turtle road mortality to prevent the population from declining. Ms. Gunson explained that signage was a temporary measure that could be effective if used properly with a planning strategy. By "temporary", she meant both spatially and temporally. Spatially, because with proper monitoring the signs could be moved to increase their effectiveness, whereas a crossing

structure such as a culvert was not a temporary measure; temporally in that the measure should be replaced by more effective measures, as part of an overall strategy.

[285] With respect to identifying intersects and the use of culverts, Ms. Gunson believes they would not work here. Ms. Gunson has been involved with numerous projects in the past that involved road mortality mitigation, and has recommended the use of culverts and determined the best location for them. She cited a study by Steen et al. to support her opinion that Blanding's turtles would most likely not use underground modified culverts, because they would favour the road-side habitat for nesting. Further, it would be difficult to locate probable intersects at a scale required for the mitigation proposed (modified culverts) because inter-wetland or nesting Blanding's turtle movements could be up to 6 km and they utilized both the aquatic and terrestrial habitat throughout the study area extensively. She added that the road network traversed this mosaic.

[286] In her opinion, to provide the best-proven mitigation for both road mortality and fragmentation, many culverts with fencing would be required; regardless, research was lacking that showed whether road mitigation effectively negated irreversible and harmful impacts of roads at a population level, according to a study by Roedenbeck et al., "The Rauischholzhausen agenda for road ecology" (2007) 12 Ecology and Society [online].

[287] She testified there was not a good methodology from road ecology science to find the intersects where Blanding's turtles would cross a road and locate it at a scale where the turtles would use the modified culvert. Ms. Gunson testified that since the habitat adjacent to the roads at the Project Site was homogenous, the turtles would use all of it making it difficult to identify the hot spots. Much of the 5.4 kilometres of road to be built would be hot spots which would require fencing and result in creating a barrier effect.

Dr. Edge

[288] Dr. Edge said that he assessed all threats to turtle life by considering that the subject property was part of a larger habitat matrix in Prince Edward County and that any turtles present on the subject property were part of a larger population in Prince Edward County.

[289] In his opinion, the threat of additional roadway mortality would be mitigated through the use of signage, speed limits and driver training. In his opinion, each of the mitigation measures on their own was effective at reducing some mortality and together as a suite of mitigation measures they could essentially reduce mortality down to a negligible level. He said speed limits and speed bumps were used in Algonquin Park

and during the two years he conducted his research there, he did not observe any road mortality of Blanding's turtles.

[290] Dr. Edge explained that an adaptive management strategy was a series of mitigation measures that could be modified to make best use of the mitigation measures. Dr. Edge confirmed that he had been involved in offering his professional opinion on impact monitoring plans but had never been involved in enforcement and implementation.

[291] Dr. Edge acknowledged that the Site's Crown land status would affect mitigation in that the educational mitigation strategies would not affect the public accessing Ostrander Point. Dr. Edge also agreed that poaching could be a problem and that signs alerting drivers to the presence of turtles would identify the area to poachers.

[292] Dr. Edge agreed that, simply by protecting the compensation lands, there would not be a net increase in the amount of land available as Blanding's turtle habitat, given that in his view the compensation site was already suitable habitat. Dr. Edge noted, however, that the monitoring plan and the development plan called for improvements to the land, although he had not conducted the kind of study that would allow him to say that in this case the habitat can be improved.

[293] Dr. Edge confirmed that his analysis did not look at cumulative effects. He added that he would not be able to determine cumulative effects without seeing the plans for the other proposed sites.

Dr. Shilling

[294] Dr. Shilling opined that traffic speed control, a proposed mitigation measure, would reduce disturbance because disturbance was roughly proportional to speed. He explained disturbance as inhibition of wildlife movement and said that road mortality increased with driving speed.

[295] Dr. Shilling referred to a study by Dr. Beaudry entitled "Identifying Road Mortality Threat at Multiple Spatial Scales for Semi-aquatic Turtles", (2008) 141 Biological Conservation 2550 which listed possible conservation measures as seasonally reduced speed limits, exclusionary fencing or zonal signage. Dr. Shilling said that speed control was one of the mitigation measures proposed in the Design and Operation Report which was consistent with Dr. Beaudry's advice. On this, Dr. Beaudry testified that he gave such advice for a circumstance where a road was already in existence, and the objective was to mitigate mortality from an existing road.

[296] Dr. Shilling said that the proposed traffic was in relation to the maintenance or post-construction activity and that there would be at most "a few cars a day". At that

rate, the mitigation activities of careful observation for adults, nest sites and emerging hatchlings, reduced speeds, and driver education, were likely to reduce the risk to Blanding's turtle populations from the proposed access road at both the Site and Prince Edward County scale. He testified that it was unlikely that strikes on the site would jeopardize the Blanding's turtle population at the scale of Prince Edward County. He explained that mitigation was designed to reduce risk and impacts and the ones proposed in the reports were sufficient in his expertise to reduce risk to most wildlife living there.

[297] Dr. Shilling stated that driver behaviour was a more important target than a few culverts strategically placed, citing Dr. Beaudry's article, *supra,* which had concluded that "the wide distribution of road mortality risk at the finest scale of individual movements challenges the notion that management interventions, operating at a single point location, such as underground passages, can be effective for wide ranging turtle species".

[298] In cross-examination, Dr. Shilling was referred to a document called "*Wildlife-Vehicle Collisions and Crossing Mitigation Measures: A Tool Box for the Montana Department of Transportation*" by M.P. Huijser et al., (2007) Final Report for the State of Montana Department of Transportation ("Montana Study"), where the authors concluded that evidence on the effectiveness of advisory speed limits at reducing wildlife-vehicle collisions remained sparse. Dr. Shilling acknowledged that advisory speed limits on highways were difficult to enforce with the public. However, he said that a reduced speed limit set up in a national park in Australia was shown to be effective. He said when it was enforced people responded appropriately and it was effective at slowing people down. He agreed that people driving through parks behaved differently than people driving on public highways. In his opinion, a speed limit could be advised and enforced at the Project Site.

[299] The same study (Montana Study) addressed the effectiveness of driver education. The authors had concluded that there were no known studies proving the effectiveness of driver education or public information efforts in reducing the number or severity of wildlife collisions. Dr. Shilling said that this was true for large public highway networks because of the large numbers of drivers in the public but not true for the contained example in Australia.

[300] Dr. Shilling said that mitigation activities that are taking place on the Site could have benefits that extend beyond the Site because turtles interact within a population that extends across the County. For example, the speed limit of 15 km/hr could be extended to the whole southern part of the County to benefit Blanding's turtle.

[301] With regards to the creation of artificial nesting sites, Dr. Shilling testified that, by increasing nesting opportunities onsite and offsite, it would increase the likelihood that there would be successful recruitment away from roads, and potentially increase the population, assuming that there were not any big causes of mortality. In this regard he quoted some passages from an article by Dr. Beaudry, that "the ability to use newly disturbed areas signals that artificial nesting sites can be detected and used rapidly by turtles" and, "along with direct nest protection through the installation of nest cages artificial nesting sites could be used to increase local population recruitment".

[302] Dr. Shilling referred to a study by Ennison and Litzkus which examined the population biology of Spotted turtles which he said were similar in some ways to Blanding's turtles. The authors developed a population model to understand the effects of losing individuals in the population and whether an organism goes extinct. He said that the authors found that when the population is considered as a meta-population, which is a group of interacting populations, then the risk of extinction of the species was low because they were able to interact with each other among the wetlands. Therefore, Dr. Shilling concluded that a population would live as long as it could have that kind of interaction or connectivity among different areas and if there was low road mortality the chance of persistence was very high.

[303] Dr. Shilling said that the adjacent property acquired by the developer was suitable for Blanding's turtle, but he did not know whether it was currently used by the turtles.

6. Analysis

[304] As noted above, the Tribunal must apply the s.145.2.1 test set out in the *EPA* in a REA appeal, considering that the Project will operate "in accordance with" the REA and its conditions. The Approval Holder and the Director draw a comparison between the analysis of mitigation measures in this appeal, and the issue of "compliance" with conditions, which has been raised in previous REA appeals dealing with human health. The Tribunal finds the comparison a faulty one. The issue before the Tribunal is not whether the Approval Holder will operate the Project in compliance with the REA conditions. Rather, the issue is whether the mitigation measures themselves, contained in the conditions, will be effective in preventing serious and irreversible harm.

[305] The testimony of Ms. Gunson, Dr. Beaudry and Dr. Edge all accord with the conclusion of the Stantec Report, that "Loss of adult Blanding's turtles, due to accidental mortality, could have a significant negative impact on the local populations."

[306] Dr. Beaudry and Ms. Gunson disagree with the next phrase in the report: "… however, current site activities (e.g. recreational vehicle use) have a similar potential effect, and through implementation of appropriate construction and post-development mitigation measures, the risk of accidental injury or mortality to Blanding's turtles can be significantly reduced." Ms. Gunson reviewed the historical reports of Blanding's turtle sightings in the vicinity of Ostrander Point Crown Land Block; a number were dead turtles on county roads, and none were found on ATV trails. While he acknowledged that ATV trails allow access for poachers, Dr. Beaudry testified that the difference between ATV use of trails currently, and vehicle use of roads after construction, is "enormous". He believes that an adult turtle struck by an ATV would have a very good chance of survival, due to the lighter weight of the ATV and the sturdy shell of the Blanding's turtle. In addition, he has concerns that a "reduction" in mortality is not effective mitigation. He testified that "population ecology tells us any mortality of an adult Blanding's turtle can be problematic".

a. Effectiveness of mitigation measures

[307] The Tribunal will turn to a closer examination of the mitigation measures, to determine their track record of success, or failure.

Development setbacks from "critical habitat"

[308] There are some mitigation measures proposed in the Stantec Report on Blanding's turtle, which are generally accepted by the experts as effective, and the Tribunal finds them to be so. A setback of 120 m was recommended around overwintering and nursery habitat, located in the permanent wetlands in the southeastern portion of the study area, "as a buffer to avoid disturbance or encroachment". Where development is prohibited by a mitigation measure, it will clearly be effective. Thus, there will be no road mortality within the setback.

[309] However, the setback was only proposed around habitat deemed by the Stantec Report to be "critical habitat" for Blanding's turtle within the Ostrander Point Study Area. Stantec defines "critical habitat" as that "which is essential for the survival of the species and which if altered by the proposed Project could result in a significant negative impact to the population within the Study Area and surrounding landscape." The Report then lists a number of factors considered in the determination of "critical habitat". The source of the list of factors is not referenced. Figure 1 attached to the Report depicts "habitat", while Figure 2 purports to depict "critical habitat".

[310] Dr. Beaudry criticised the concept of critical habitat in the report. His witness statement notes there is a "mismatch" between the summarized critical habitat and the

definition provided: “If any of the types of habitat discussed is altered in such a way as to decrease fecundity or survival rates, for example by increased vehicle traffic, a significant negative impact on the population could be observed.” Dr. Beaudry testified that conservation biologists for the past 20 years have used the definition of critical habitat as “all necessary habitat needed to fulfill the life cycle without reducing its fitness, without reducing reproductive output or increasing mortality or decreasing survivorship”. Thus conservation biologists consider critical habitat to be the whole of the types of habitat required for all phases of Blanding’s turtle life activities.

[311] Dr. Edge agreed with Dr. Beaudry’s definition of critical habitat, rather than the one used in the Stantec Report.

[312] Of note, Blanding’s turtle was not a species at risk at the time the Stantec Report was written. It is now threatened in Ontario and endangered in Nova Scotia, and considered globally endangered by the IUCN. The definition of “habitat” in the *ESA*, for a species such as Blanding’s turtle which does not yet have a habitat regulation, is:

> 2. (1) “habitat” means,
>
> (b) with respect to any other species of animal, plant or other organism, an area on which the species depends, directly or indirectly, to carry on its life processes, including life processes such as reproduction, rearing, hibernation, migration or feeding,

[313] Given the expertise of Drs. Beaudry and Edge, the Tribunal prefers their interpretation of critical habitat over the approach taken by Stantec, of labelling only permanent wetlands (overwintering and nursery habitat), as “critical habitat”. Under such a definition, the whole of the Ostrander Point Crown Land Block should benefit from a development setback.

No construction or maintenance activities during active period

[314] Another mitigation measure included in the Stantec Report and accepted as effective by Drs. Beaudry and Edge, is to prevent construction and road maintenance activities from taking place during the active period of Blanding’s turtle. This mitigation measure was proposed in the Stantec Report in response to the acknowledged increased risk of road mortality to Blanding’s turtles during the construction phase of the Project. The Report notes:

> Blanding’s turtles are likely to be at an increased risk of accidental injury or mortality during construction. In particular, equipment moving through flooded pools in the spring and early summer may result in injury to Blanding’s turtle. Turtles using access roads as basking sites or for movement are also likely to be at an increased risk. Loss of adult Blanding’s turtles, due to accidental mortality, could have a significant impact on the local populations. (at p. 4.5)

[315] The mitigation measures are thus intended to address this "increased risk" and "significant impact on the local populations" that are using access roads.

[316] This mitigation measure is echoed in the *ESA* Permit, which is a separate instrument from the REA. Although the Approval Holder is bound by the *ESA* Permit, a contravention of which may lead to prosecution under the *ESA*, for the Tribunal's purposes in this analysis it is simply evidence relevant to conditions to the REA, which must be assessed as would any other condition. The panel notes that neither of the MNR witnesses who testified with respect to the *ESA* Permit are Blanding's turtle experts.

[317] The *ESA* Permit prohibits construction activities from May 1 to October 15. Although there was no map provided to the Tribunal showing the new roads, or their location, the Tribunal accepts that preventing construction from May 1 to October 15 is an effective method of reducing road mortality during construction, as well as road maintenance activities post-construction where they are prohibited from May 1 to October 15. However, the Report does not go on to prevent these same risks arising from turtles' use of the roads, when they occur during the active period in the years post-construction.

Reduced speeds, driver education and turtle crossing signs

[318] Dr. Shilling's witness statement notes his opinion at paragraph 7(4) as follows:

> At the scale of Prince Edward County, it is unlikely that strikes on the Property would jeopardize the Blanding's turtle population. Mitigation activities of careful observation for adult and nest sites, as well as emerging hatchlings, reduced speeds, and driver education are likely to reduce the risk to Blanding's turtle populations from the proposed access road at both the Property and Prince Edward County scale.

[319] Dr. Shilling's statement concludes mitigation activities reduce risk, but he does not indicate to what degree.

[320] In addition, Dr. Shilling's statement includes the assumption that the following mitigation activities will be taking place:

- There is careful observation for adult and nest sites and emerging hatchlings;
- There are reduced speeds;
- There has been driver education.

[321] The "careful observation" for turtles, nests and hatchlings is within the power of the Approval Holder to make happen. The Tribunal has no difficulty with this mitigation requirement. However, whether drivers reduce their speed, and how they respond to education if they receive it, are not within the power of the Approval Holder. This is

particularly true for members of the public accessing the Site. Dr. Shilling testified that, when enforced, there is a measurable reduction in wildlife-vehicle mortality. He noted that for the Ostrander Point project,

> the conceptual description says that a speed limit of 15 kilometers per hour would be used and at least staff drivers would be advised about the importance of this, which means there is a greater influence on that class of drivers. Whether there would be law enforcement because of the other potential drivers on the roads I have no idea.

[322] Dr. Shilling referred to a study from Australia, which found that speed limits were effective to slow down people driving through a national park. When counsel for the appellant referred to the Montana Study, *supra*, which found that there were no known studies proving the effectiveness of driver education or public information efforts in reducing the number or severity of wildlife collision, Dr. Shilling agreed this was true for large public highway networks because of the large numbers of drivers in the public, but not true for the contained example in Australia.

[323] The Tribunal finds that Ostrander Point Crown Land Block is open to public access at all times. If the Ostrander Point Site were to be managed as a provincial park or protected area, with staff at the entrance and the expectation of speed limit enforcement, the success of speed limits and education as mitigation measures to reduce but not eliminate fatalities, would likely improve. However, there are no such requirements in either the REA or the *ESA* Permit.

[324] The *ESA* Permit requires educational signage. The Tribunal accepts Ms. Gunson and Dr. Beaudry's testimony, supported by the Montana Toolbox study, that turtle crossing signs do not work for the general public. While they may have some positive impact for people who are motivated to protect turtles, driver habituation renders them ineffective. The Montana Study, *supra*, concludes as follows:

> Data on effectiveness of several other mitigation measures are lacking or insufficient to justify a wildlife-vehicle reduction estimate. Nonetheless, the authors of this report suggest implementing some of these measures, at least under certain conditions (Table 4). For example, public education may not reduce wildlife-vehicle collisions, or at least not substantially, but the public may appreciate being informed about the extent of the wildlife-vehicle collision problem and the efforts that are undertaken to reduce the problem at specific locations. However, public education as a stand alone mitigation measure is unlikely to result in a substantial reduction of wildlife-vehicle collisions. …
>
> Some other measures appear promising and worthy of (further) study because of intuitive potential benefit, available data appear encouraging, or because the measure may only be applicable for specific situations (Table 4). These measures, however, lack a wildlife-vehicle collision reduction estimate at this time. Measures that fall into this category are traffic volume and speed reduction, wildlife crossing guards, non-

> standard and seasonal wildlife warning signs, animal detection systems (with or without wildlife fencing), on-board animal detection systems, roadway lighting, vegetation removal, culling, reducing habitat quality, boulders in right-of-way, and fencing in combination with a signed gap in the fence or a crosswalk.

[325] Dr. Edge's experience with Blanding's turtle in Algonquin Park is of limited value as evidence with respect to road mortality. First, as he acknowledged, it is anecdotal. Second, the density of turtles in the two locations is likely quite different, given the different geographic conditions in that Ostrander Point habitat involves a barrier at the shore of Lake Ontario. Dr. Beaudry testified that, although Blanding's turtle is thinly distributed as a species, there is variation in density from site to site. Dr. Edge's experience at Algonquin Park is illustrative of this, as it took three weeks to see his first Blanding's turtle in the park, but he was surprised at finding two Blanding's turtles during one visit to the area of the Project Site.

[326] Ms. Gunson and Dr. Beaudry clearly believe that speed limits and driver education will not be successful for the general public. The condition of the road will dictate speed of drivers, not posted signs. The conditions of the roads will be dramatically improved, and there will be more of them.

[327] In addition, the signs will increase public knowledge about presence of Blanding's turtle and increase the likelihood of poaching, as acknowledged by Dr. Edge. Dr. Beaudry noted that the risk of poaching is taken seriously enough by herpetological researchers and scientific journal editors so as to lead them to modify the location of published research results, to prevent recognition of the features and find locations of Blanding's turtle on the ground.

[328] The Stantec Report recommends "to minimize awareness to the presence of Blanding's turtles, in an effort to avoid poaching, on-site signage should be discreet about species presence. It is likely that the presence of the operating facility with surveillance and maintenance staff will deter illegal activity within the project area, thus discouraging poaching." There are no *ESA* Permit requirements to mitigate the increased risk of turtle poaching.

[329] Of note, Dr. Beaudry found the concept of "reducing road mortality" to be problematic for species such as Blanding's turtle, where the populations are small or thinly distributed. Populations can have natural fluctuations due to climate or an increase in predator populations; adding road mortality for this type of species is very dangerous. Dr. Beaudry's opinion, assuming a low traffic volume on the Project's roads, is that the only effective mitigation measure in this situation is not to build the

roads, in order to prevent serious and irreversible harm to this population of Blanding's turtle.

[330] With better and longer roads the Site will be more accessible, there will be more traffic than previously, and more traffic than simply construction and maintenance vehicles. The Tribunal finds that on a balance of probabilities, turtle crossing signs are not effective, and will not reduce mortality enough to offset the increased risk of mortality and poaching caused by the introduction of new and better roads on this Site.

Creation of nesting habitat

[331] The *ESA* Permit requires, at para. 10.2, that the Approval Holder strategically create nesting habitat for Blanding's turtle on the eastern side of the site located within 250 m of wetland habitat and at least 400 m away from the project access roads, for the duration of the *ESA* Permit. The nesting habitat would be monitored annually and subject to reporting requirements.

[332] The location is blacked out in the copy filed into evidence in the hearing, evidently due to protection concerns for the turtles. However, it is not at all clear that Blanding's turtles would choose artificial nest sites over natural sites, or roadsides. Dr. Beaudry testified that he has done studies on the question of whether artificial nest sites can be created close to wetlands, to reduce road risk. He found, however, that Blanding's turtles bypassed sites that appeared suitable to the researchers. He concluded that our understanding of nesting sites is "coarse", and that the species has an "agenda" that we don't understand. He did agree on cross examination that artificial nesting sites should be explored, where no other mitigation measures are possible.

[333] There is already significant nesting habitat throughout the wetland matrix on and adjacent to the Project Site. The creation of "strategic" nesting habitat , even if it were successful in attracting turtles, has not been shown to be effective at dissuading Blanding's turtles from using roadways as nesting habitat. Although not considered as such in a calculation of habitat gain or loss, the creation of 5.4 km of new roadways *de facto* creates many kilometres' worth of new, but perilous, nesting habitat for Blanding's turtle, thereby increasing their risk of road mortality.

Impact monitoring plan

[334] The *ESA* Permit requires that the Approval Holder design an Impact Monitoring Plan ("IMP") for Blanding's turtle, prior to construction. No IMP was presented to the Tribunal, nor was a draft one entered as an exhibit (in contrast to the Draft Alvar Management Plan). The *ESA* Permit lists the following minimum elements to be included in an IMP:

- Ensuring impact monitoring takes place every year;
- Ensure the Site restoration and mitigation measures are installed, maintained and function as intended;
- Identification of Blanding's turtle high frequency intersects with the proposed road using an MNR approved methodology. Once these intersects are identified and provided to MNR, using adaptive management, site specific mitigation measures may be implemented, to the approval of MNR (e.g., relocation of signage to raise awareness and wildlife travel corridor/underground passage/modified culvert constructed); and
- Monitoring mortality of Blanding's turtle in accordance with an MNR approved protocol as a result of the Construction Activities and Maintenance Activities.

[335] As with the Property Management Plan ("PMP") referred to in the *ESA* Permit, which is intended to eventually guide the management of the compensation property, and as with the Alvar Management Plan, this future IMP is referred to in the REA materials but there are no details finalized. As a result, the Tribunal cannot evaluate its effectiveness. In addition, the appellant PECFN, on whom the onus rests to prove that engaging in the Project in accordance with the REA will cause serious and irreversible harm, cannot bring evidence on the IMP or the PMP. The REA therefore lacks important detail for some mitigation plans.

[336] There are a number of weaknesses with the intended minimum IMP measures. One refers to ensuring mitigation measures "function as intended". The list of minimum IMP elements does not include contingency measures, however, in the event the untested mitigation measures are ineffective.

[337] The *ESA* Permit refers to site specific mitigation measures such as signage, underground passage or modified culverts to prevent road mortality. However, their efficacy relies on identifying high frequency intersects. As noted above, the Tribunal accepts the evidence of Dr. Beaudry and Ms. Gunson with respect to the inefficacy of culverts or passages at the Project Site. Dr. Shilling endorsed Dr. Beaudry's opinion in this regard. All experts agreed that the entire Site is a patchwork of suitable Blanding's turtle habitat, with temporary wetlands scattered throughout. All experts agreed that Blanding's turtles will criss-cross the Site during the active period. The evidence reveals that there are permanent wetlands in the south-east corner of the Site, as well as adjacent to the Site to the north, with connected wetlands angling down to the Lake adjacent to the Subject Property on the west side (see Appendix B). The Tribunal

accepts that it would not be possible to identify high frequency intersects at the granularity of the site scale.

Compensation property

[338] The REA conditions require that 37.65 ha property to be set aside to provide, restore and actively maintain habitat for Blanding's turtle, subject to a 20 year conservation easement. In addition, the property shall be maintained in its current state until MNR approves a Property Management Plan.

[339] The Tribunal was not given a map showing the location of the compensation property, but was informed it was generally north of Helmer Road, west of Babylon Road, in the form of a rectangle with a long north-south orientation, and narrow east-west frontage.

[340] However, the area north of Helmer Road is already considered Blanding's turtle habitat. Dr. Edge noted there are permanent wetlands suitable for overwintering habitat in the compensation property, and he observed a Blanding's turtle at that location during his visit to the area. The compensation property therefore does not add to Blanding's turtle habitat, and any habitat lost on the Project Site will amount to a net loss of Blanding's turtle habitat in Prince Edward County. There was no evidence to the effect that the habitat on the compensation site would benefit from improvements.

[341] The compensation property is also on the north side of Helmer Road, west of Babylon Road, which are county roads that separate the compensation property from the permanent wetlands which Stantec identified as "critical habitat", to the south. Therefore, in order to reach the compensation property, the turtles using the southern wetlands must cross a County Road, with its associated risks.

a. Serious and Irreversible harm

[342] The Director argues that, since an *ESA* Permit may only be issued if the Minister of Natural Resources is satisfied that the conditions of the permit will result in an overall benefit to the species, this permit provides strong evidence that there will not be serious and irreversible harm to Blanding's turtle and Eastern Whip-poor-will.

[343] However, as noted by Mr. Baxter, the *ESA* Permit is issued by the MNR after a determination that the species **as a whole in Ontario** will have an overall benefit. The Tribunal is considering the status of the Blanding's turtle population that occupies this Project Site and the surrounding landscape. Due to the difference in scale, the MNR's determination of "overall benefit" for the species will therefore not be determinative of the second branch of the test with respect to Blanding's turtle.

[344] The analysis of serious and irreversible harm is closely linked to the size of the population considered.

[345] Dr. Edge gave a description of the geographic extent of the population at Ostrander Point, as roughly extending from the southern shore of Lake Ontario up five or six kilometers inland to where the landscape changes from more of a wetland forested matrix to agriculture, east to west along the entire south shore of Prince Edward County.

[346] Dr. Beaudry testified that, in his opinion, “serious” harm is something that can lead to a decrease in reproductive output, or an increase in mortality, that can lead a local population to extinction. He does not distinguish between “serious” and “irreversible”.

[347] Dr. Beaudry pointed to modeling efforts that have been undertaken to project virtual population survival. The estimated annual survivorship of Blanding’s turtle is 96%. Studies have found that with an additional 2% road mortality, i.e., a drop to 94% adult survivorship, there is a clear loss of individuals which will result in a fairly quickly declining population. Slower declines may occur with 1% - 2% road mortality. Road mortality is very damaging especially where populations are small or thinly distributed, as are Blanding’s turtle populations.

[348] Dr. Beaudry noted that the loss of a population would have a number of consequences to the ecology of a site, including removing a “stepping stone” population that can result in isolation of other populations, and thus have consequences on a broader scale.

[349] Dr. Beaudry was confident in concluding the Project will cause serious and irreversible harm to Blanding’s turtle without knowing the population size at Ostrander Point, because the initial size of the population will only lead to a different end-time when the population will go extinct. The length of time, he stated, is the only variable. He assumed the population would be stable in all other respects, which is the best case scenario.

[350] Ms. Gunson testified that research on Blanding’s turtle indicates that a population could sustain a 2 to 5 per cent mortality. She said that having an individual die would lead to a decline in population. Ms. Gunson noted that there is no place in southern Ontario more than 1.5 km from a road.

[351] The Report by the Committee on the Status of Endangered Wildlife in Canada (“COSEWIC”) on Blanding’s turtle (2005) notes that, due to its life-history strategy, with a delayed maturity and great longevity, they are “highly vulnerable to any chronic

increase in adult mortality rates, even when these increases are quite small (<5%)" (at p.14). The same Report cites, at p.20, the findings from a study by Browne (2003) in Point Pelee National Park, that "if one extra (beyond natural mortality) adult female is killed by a vehicle every two years, and if nest mortality is >32% annually, the population would slowly decline to extinction". It also remarks on the findings of male-biased populations, which "could be the result of road mortality affecting nesting females more than their male counterparts".

[352] As noted above, Dr. Shilling used the scale of "Prince Edward County" for his opinion that engaging in the Project will not cause serious and irreversible harm to this species. However, Dr. Shilling said he did not know how many Blanding's turtles, or populations of such turtles, there are in Prince Edward County or at the Project Site. Dr. Shilling also relied on the concept of a "meta-population", which is a group of interacting populations.

[353] In the article Dr. Shilling submitted to support the concept of meta-populations, (Enneson and Litzgus), the authors do note that "the meta-population model suggests that dispersal between wetlands used for breeding by spotted turtles contributes to persistence." However, the final conclusion at pp.1252-1253 is sobering:

> Our case study of PVAs for spotted turtles at a relatively pristine site indicated a relatively high risk of extinction in the absence of anthropogenic additive mortality (e.g., habitat destruction, harvesting, and road mortality). Application of our models to populations that are in less pristine habitats would indicate a grim future for the species.

[354] Dr. Shilling stated that his opinion is based on the extent of appropriate habitat in the area, the number of observations of Blanding's turtles in the area and the rate of road mortality in the area. He said all of these factors led him to conclude that the Project, taking in consideration the construction and mitigation activities, was not going to cause serious and irreversible harm. The Tribunal notes that his opinion is predicated on successful mitigation of road impacts. In addition, he acknowledged that serious and irreversible harm may eventually occur from the combination of all the development along the Prince Edward County south shore. Dr. Shilling agreed that, if there were three Blanding's Turtles at the site and one of them got killed, that would be serious and irreversible harm.

[355] As noted above, interpretation of serious and irreversible harm will involve a case-by-case consideration of a number of factors. For the purposes of its analysis with respect to Blanding's turtle, the Tribunal accepts the scale of the population that was used by Stantec in the preparation of its Blanding's Turtle Report, at p. 4.1, *Extent of the local population,* where it has considered "the population within the study area and

surrounding landscape." (See also excerpt from Stantec's "critical habitat" consideration, noted above). This accords with Dr. Edge's description of the population, and Dr. Beaudry's comments on the biological definition of population, which in this area would extend off site to the wetlands surrounding the study area.

[356] No data was available on the size of the Blanding's turtle population, whether on site, in the surrounding area, or in Prince Edward County as a whole. There is no report on current or expected traffic to the area, nor has any study been done on the density of Blanding's turtle on the Ostrander Point Crown Land Block. The Approval Holder argues that any uncertainties, such as the size of the population, must work in favour of the Approval Holder because uncertainty cannot rise to the test of "will cause".

[357] The approach suggested by the Approval Holder would require an "absolute" level of certainty with respect to the impacts of a Project. Such an approach is incompatible with the nature of biology, and our imperfect understanding of the impacts of human activity on plant life, animal life and the natural environment. The Tribunal is mindful of the following conclusion at the last page of the article by Roedenbeck et al., which is in evidence:

> For road ecology, and especially those issues relevant to landscape-level planning and management, a strong weight of evidence, i.e., scientific proof, is unattainable in practice, and to insist upon it is tantamount to discounting all the scientific research that is likely to be conducted now or in the foreseeable future.

[358] An enormous amount of information on this species was brought forward in this appeal. There is certainly enough information for the Tribunal to make findings on the conservation status of the species, its life history traits that make it vulnerable to harm from the Project, the precise type of harm that the Project will cause, and the significance of this type of harm (road mortality and poaching) on Blanding's turtle. The Tribunal finds that in such a case, knowledge of the exact size of the population that will be impacted by the Project, although helpful, is not required.

7. Conclusions on sub-issue 1

[359] The Tribunal finds that engaging in the Project in accordance with the REA will cause serious and irreversible harm to Blanding's turtle. The Tribunal makes this finding having regard to the biological population that will be impacted by the Project; that is, the population that uses the habitat on the Project Site and the surrounding area.

[360] It appears that the mitigation measures to be employed during the construction phase of the Project, i.e., no construction or maintenance from May 1 to October 15, would be effective to prevent serious and irreversible harm to Blanding's turtle from

construction activities of the Project itself. However, such measures do not prevent use of the roads in the post-construction phase. In addition, the Tribunal finds on a balance of probabilities that the fact that this Project is on Crown land and open to public access will reduce the effectiveness of road mortality mitigation measures, including educational signage and reduced speed limits, to the point they will no longer be effective in reducing mortality to a level that would prevent serious and irreversible harm to Blanding's turtle. The one mitigation measure that the evidence indicates would be effective to some degree, i.e., speed bumps, does not nearly outweigh the increased use of the Site that will take place due to maintenance traffic and easier public access, and the measure will have no impact on poaching.

[361] As noted in the "Legal Test" section above, whether the evidence in a hearing establishes harm rising to the level of serious and irreversible harm will be a case-by-case analysis. Each wind farm project may impact plant life, animal life or the natural environment in a unique way.

[362] The Tribunal finds that, in its analysis of Blanding's turtle for the Ostrander Point Project, the following elements are importantin determining whether engaging in the Project in accordance with the REA, will cause serious and irreversible harm:

- Conservation status of the species
- Species habitat on the site and in the area
- Vulnerability of the population
- Type and extent of harm caused by the Project
- Vulnerability of the species to this type and extent of harm due to its life history traits
- Mitigation measures in the REA
- Demonstrated effectiveness of the mitigation measures.

[363] The Tribunal finds that mortality due to roads, brought by increased vehicle traffic, poachers and predators, directly in the habitat of Blanding's turtle, a species that is globally endangered and threatened in Ontario, is serious and irreversible harm to Blanding's turtle at Ostrander Point Crown Land Block that will not be effectively mitigated by the conditions in the REA.

Birds

Evidence of PECFN witnesses

Mr. Okines

[364] David Okines was qualified to give expert opinion evidence on the banding, identification and movement of birds, including migratory birds, in the Prince Edward County South ShoPECFN argues that re Important Bird Area ("PECSS IBA"). Mr. Okines is a biologist who has been the resident Station Manager for the past ten years at PEPtBO collecting the data, including radar imagery, required to establish the daily estimate of the numbers of birds of each species in and/or passing through the area.

[365] The PEPtBO monitoring station, which is 10 kilometres from Ostrander Point, is one of 25 stations in the Canadian Migration Monitoring Network, which sends data to Bird Studies Canada to create species population indices. The annual density of birds in the Prince Area Point area is 500,000 to 750,000 birds. Mr. Okines stated that data suggests that the same density of birds were passing through the whole of the PECSS IBA. It is Mr. Okines' evidence that the PECSS is a major migration highway "used by millions of birds" as a stopover site and staging area.

[366] Mr. Okines provided evidence with respect to the average and total number of various bird species observed by PEPtBO during spring and fall migrations over the past 10 years. Mr. Okines explained that diurnal passerine migrants and nocturnal passerines had different migration habits. During their fall migration, nocturnal passerines arrive at Lake Ontario shortly before dawn and either land on the shoreline or attempt to cross the lake. If they did not have enough time to cross the lake before sunrise, they would return to the shore and would move up to 5 km inland to feed during the day before re-starting the migration south through the PECSS IBA in the evening. He opined that these migrants would therefore be exposed to wind turbines three times during one day. Mr. Okines also testified that peak migration periods for one species would not be the same for another species.

[367] Mr. Okines testified that diurnal passerine migrants, such as blue jays and raptors, move over the land and avoid going over water bodies. Therefore these birds fly down the length of the coast and when they get to the end, they may turn and go over short distances of water but would not fly 60 miles across the lake.

[368] Mr. Okines showed radar sequences that he testified demonstrate that millions of birds were crossing Lake Ontario to and from their breeding sites further north. He said the images also illustrate that the birds are using the entire shoreline of the PECSS IBA.

[369] Mr. Okines stated that the highest number of passerines is seen when their migration reaches its peak in mid-May. The birds counted in the beginning of August are local breeding birds, and the number of birds starts to increase mid- to late August with the number of migrants from the Boreal Forest arriving. Mr. Okines explained that in the spring, the peak was around 4,500 birds going north to breed and when they come back in the fall the peak number was around 8,000 birds.

[370] Mr. Okines stated that the average number of birds expected to cross the whole PECSS IBA per day in the fall was 85,000 birds. With regards to hawks, Mr. Okines added that 35,000 individuals have been counted in the fall for the five day count period.

[371] With respect to ducks, which is part of the reason the area was designated an IBA, Mr. Okines named the species that winter and those that migrate through the area. He noted that the number of Long-tailed ducks seen in one day in a peak year could be 225,000, which is about 20 percent of the North American population. A one-day peak of 6,000 Mergansers had been observed in late October, but the average number of Mergansers in both spring and fall was around 250, per 5 day count period.

[372] In Mr. Okines' view, the introduction of wind turbines anywhere along the south shore would create serious and irreversible harm to plant life, animal life or the natural environment and would create an unnecessary obstacle to the safe migration of all species.

[373] On cross-examination, Mr. Okines agreed that Henslow's Sparrow has not been recorded in the area since 1994. Also, PEPtBO has not observed a Kirtland's Warbler, but Mr. Okines stated that the chances of seeing one of the six birds in Canada was pretty small but there was a chance that they could pass through Ostrander Point during their fall migration. Regarding resident birds, Mr. Okines noted that there are eight Whip-poor-wills that breed in the vicinity of the Project.

Mr. Cheskey

[374] Ted Cheskey was qualified as an expert in bird natural history, bird conservation in Ontario, and IBAs. He is the manager of Nature Canada's bird conservation programs and works with BirdLife International, which began the internationally recognised IBA program in the 1980's, although he was testifying as an individual rather than a representative of Nature Canada.

[375] Mr. Cheskey explained that IBAs are part of a program of Bird Life International that was established to identify, monitor and protect a global network of sites for the conservation of the world's birds and other biodiversity. He explained that the IBA

program came to Canada in 1996 and is run by Nature Canada and Bird Studies Canada.

[376] Mr. Cheskey explained that the three criteria for a site to qualify as an IBA are: it supports large numbers of birds, of both species and individuals; it can support threatened species; or it supports birds that are highly restricted by range or habitat. He indicated that there are three different levels of qualification: global, continental and national, and that most IBAs in Canada met the threshold based on the number of individual birds, i.e., 1 per cent of the species population at either the global, continental or national level at a site. He indicated that there are 600 IBAs recognized in Canada at all levels of significance and added that roughly 300 of them, including the PECSS IBA, are considered globally significant.

[377] Mr. Cheskey agreed that the PECSS is recognized as an IBA on the global and national levels due to its waterfowl, particularly Long-tailed Duck, Greater Scaup and the White-winged Scoter. He also agreed that the "Complete Bird Records" for the PECSS IBA identified 2000 raptors, which is short of the 10,000 raptors needed for the site to qualify as a nationally significant IBA, although he noted that the intent of the criteria was to apply them over a period of time and not on one particular day.

[378] Regarding the effect of the Project on bird migration, Mr. Cheskey indicated that the PECSS IBA contained the largest natural coastline on Lake Ontario. He explained that the peninsula is essential to bird migration because it provides staging and landing areas, and has wetlands that provide food sources. In his witness statement he said that a combination of factors elevates the risk to birds at the Project Site beyond what can be expected to be reduced by mitigation, the primary ones being its location on a Great Lakes peninsula, and its ecology as a highly productive ecosystem of natural habitat proximate to a productive literal zone and coastal wetlands. He believes declining species like Tree Swallows and Purple Martins would be put at special risk, based on high mortality rates at the Wolfe Island project.

[379] Mr. Cheskey pointed out that Ostrander Point has the fourth highest migration density of raptor sites in North America. He added that the MNR had designated it a priority area for restoring Bald Eagles. In his opinion, raptor populations are especially vulnerable to wind turbines because of their soaring habits and low reproductive rates.

[380] Regarding breeding birds, Mr. Cheskey believes that principally grassland species are at risk, such as Eastern Meadowlark, Eastern Kingbird, and Field Sparrow, all with declining populations. American Woodcock and Common Snipe were also vulnerable because of their aerial courtship displays at turbine blade level. In his opinion the turbines and pads, the road network, and the other infrastructure, as well as

the associated disturbances would have a serious negative impact on the healthy breeding bird community at Ostrander Point.

[381] Mr. Cheskey stated that Dr. Kerlinger did not identify all of the types of risks to birds from the Project. Mr. Cheskey would include collisions with the turbine blades, the meteorological tower, power lines and towers; loss of breeding and feeding habitat because of displacement by the turbines and service roads; electrocution from contact with the power lines; and an avoidance or "barrier" effect for certain bird species.

[382] Mr. Cheskey stated that the bird fatality rates are underestimated by Dr. Kerlinger because none of Dr. Kerlinger's examples resemble the habitat and geographical conditions at Ostrander Point. Mr. Cheskey said that there are no other sites within Ontario, and likely Canada, where a wind farm has been built on a peninsula with such highly productive natural habitats along a shoreline.

[383] Mr. Cheskey disagreed with Dr. Kerlinger's conclusion that bird use of the Project area would not be significant. Mr. Cheskey said that nine turbines would cover about 50,000 m^2 of air space, and that radar studies showed that 40 to 50% of "targets" detected are within the range of the turbine blades.

[384] Mr. Cheskey stated that his opinion that the casualty rates from the Project would exceed MNR thresholds was based on the fact that there are no other wind projects built on a Great Lakes peninsula with natural habitat comparable to the Project, that shorelines are disproportionally important for birds, and the Project turbines would be located within 200 metres of the shoreline.

[385] Mr. Cheskey said the types of mitigation that were proposed, the use of a radar-based detection system, turbine shutdowns, and studies could address the on-site impact to migrating birds, but that the Project would also have an impact on the breeding bird community at Ostrander Point through displacement.

Mr. Evans

[386] William Evans was qualified as an expert in avian acoustic monitoring and nocturnal bird migration.

[387] Mr. Evans took a "didactic" approach in his testimony. He first considered the meaning of "serious and irreversible harm" in s. 145.2.1 of the *EPA*, and then focused his evidence as an example of how it would play out for one species in decline, Purple Martin. Purple Martin is an aerial insectivore whose population has declined 5 per cent per year in Ontario since surveys began in 1967. He used this species to demonstrate his assertion that it is conceivable that the cumulative impact of Ontario wind farms will accelerate the 5 to 7.5 per cent annual decline in Ontario of Purple Martin population.

[388] Mr. Evans stated that bird carcass counts typically used in turbine mortality monitoring are not actual fatality rates but "indices of fatalities based on the survey methods employed." He compared the different survey methods used at Maple Ridge and Wolfe Island (the two wind farms closest to Ostrander Point) and concluded that, if the survey methods used at Maple Ridge had been adopted at Wolfe Island, it would have produced significantly different results, i.e., a much higher number of bird fatalities at Wolfe Island, including as many as 100 Purple Martins.

[389] Regarding the Project, Mr. Evans believes that it will kill more birds than the Wolfe Island project, which has the highest fatality rate in Ontario, because Ostrander Point has a greater concentration of migrating birds, it is a peninsula with a long stretch of shoreline, and the turbines will be 8.5 m taller.

[390] Mr. Evans is concerned that the Project Site would become a population sink for Purple Martin. He noted that while the Stantec study had reported 67 Purple Martins at the Project Site, the count is an underestimate because the surveys were done in the early morning, which is not prime time for surveying aerial insectivores.

[391] To demonstrate the impact of scale, Mr. Evans testified that, if there are 20 individual birds left in Canada and a single one is killed by the Project, it would constitute serious and irreversible damage for the population in Canada. On the other hand, the death of one bird, out of the total global population of 50,000, would not constitute serious and irreversible damage to the global population.

[392] In Mr. Evans' opinion there should be a cumulative impact study of impacts to aerial insectivores from wind farm projects along the north shorelines of Lake Ontario and Lake Erie. In his opinion, the likely late summer concentration dynamics of Purple Martin, Tree Swallow and other aerial insectivores such as Common Nighthawk and Chimney Swift, in the vicinity of the Project would lead to very high fatality rates.

[393] He also anticipates that the Project would cause exceptionally high mortality of night migrating songbirds in fall, and high raptor mortality rates. Mr. Evans was uncertain what the level of waterfowl and shorebird fatalities would be at the Project.

[394] Mr. Evans summarised his opinions in his witness statement as follows:

- the Project would not have a measureable impact to global populations of any bird species based on current population levels;
- the Project would have serious and irreversible impacts to local breeding populations in the immediate vicinity of the Project;

- the cumulative impact of the Project and other wind energy facilities along the north shoreline regions of Lake Erie and Lake Ontario could be expected to have serious and irreversible effects on the Ontario populations of a number of species of aerial insectivores (e.g., Purple Martin, Tree Swallow, Common Nighthawk, Chimney Swift);
- the Project would have the highest fatality rates per MW for night migrating songbirds in North America; and
- the Project would have the highest fatality rates per MW for raptors in North America.

Mr. Scott

[395] Martin Scott was qualified as an expert on birds in the United Kingdom and in renewable energy projects in the United Kingdom. He is an ecologist with thirty five years of experience in ornithology including ten years in relation to the interaction of birds and renewable energy projects, mainly in Scotland, but also in Canada. Mr. Scott provides technical, environmental and planning support to utilities, developers, industry and communities in relation to ecology. Mr. Scott testified that when he is providing technical, environmental and planning advice to a developer, the key consideration is "location, location, location". It is his view that a key ecological indicator is that Ostrander Point is an important migration corridor.

[396] It is Mr. Scott's view that the proposed Project is an "egregious example" of a "renewable energy project that is simply in the wrong place." In this regard, Mr. Scott referred to a letter from Environment Canada ("EC") to the MNR dated February 24, 2010, with comments on Ostrander Point Wind Energy Park, made in relation to EC's regulatory interest in migratory birds, species at risk and water quality. EC states:

> The Study Area contains unique habitats (i.e. alvar, open woodland) that are uncommon in southern Ontario. In terms of overall quality, it is one of the best areas for birds EC has seen in southern Ontario. EC agrees that this project merits a Level 4 Category of Concern." (p.2)

[397] It is Mr. Scott's opinion that the Project as approved will cause serious and irreversible harm to birds through fatalities and habitat displacement. He is also concerned that allowing industrial wind turbines in an IBA "would set a damaging precedent for all internationally important sites". He described the proposed radar mitigation system ("MERLIN") as a technology in its infancy that is useful for mapping and recording bird activity but not useful for collision avoidance.

[398] He stated that in Scotland where a development will affect, or has the potential to affect, a site designated as an IBA, the Scottish Government is required to consider a

series of legal tests set down in Article 6 of the European Commission's Habitats Directive (Directive 92/43). The first question is whether there would be a significant adverse effect on the integrity of the site. If the proposal failed the first test, the government would ask whether there might be alternative solutions to the proposal including other locations or technologies. He added that the government would then have to consider whether there were imperative reasons of overriding public interest which justified allowing such a development. In his opinion, the Project would have a significant adverse effect on the integrity of the site and there were many clear alternatives to the proposed Project.

[399] Mr. Scott stated that there is increasing evidence that both the locating of poorly sited turbines and the effects of habitat fragmentation would be a direct threat and cause serious and irreversible harm to the breeding bird community. He listed the species he felt would be impacted.

[400] Mr. Scott stated that the Project area is also important for migratory birds, and he listed the migrating species he thought were likely to be impacted.

[401] Regarding species linked to the IBA, Mr. Scott noted the species of waterfowl and shore birds which are migratory birds that are linked to the IBA.

[402] Mr. Scott indicated that turbines were likely to create a barrier effect which would be amplified by the “isthmus factor”. He stated that the area was already a bottle neck for migrants and that funnel would be narrowed greatly if even the precautionary displacement factor was applied.

[403] Mr. Scott also stated that cumulative impact is a significant issue. He stated that one wind project would be additive to another.

[404] When cross-examined as to which species-specific factors are relevant to assessing the bird vulnerability and mortality from a wind farm, in addition to foraging ranges, collision risk, disturbance distances and other relevant aspects of behavioural and population ecologies, Mr. Scott explained that increased prevalence of prey such as small mammals in wind farm areas drew eagles and vultures similar to increased presence of grouse species attracting larger species that prey on them.

[405] When cross-examined on what site-specific factors are relevant to assessing the bird vulnerability and mortality at a wind farm, Mr. Scott identified collision risk, flight lines of each species in the area, and the level of bird activity on the site.

Director's witnesses

Ms. McGuiness and Mr. Prevost

[406] Fiona McGuiness is a biologist with a Master of Science degree in Watershed Ecosystems. She is a Fish and Wildlife Policy and Program Advisor for the Renewable Energy Program of the Ontario MNR, and supported the development of MNR's Bird and Bird Habitat Guidelines for Wind Power Projects ("*Bird Guidelines*"), and Bat and Bat Habitat Guidelines for Wind Power Projects ("Bat Guidelines"), both updated in 2011. Ms. McGuiness was qualified as an expert in the impacts of wind turbines on birds and bats, and in the MNR Bird and Bat Guidelines.

[407] It was her evidence that the MNR is not generally concerned with bird mortality at wind farms because the average is around 2.5 birds per turbine, which is considered low. The Bird and Bat Guidelines provide methods to monitor bird fatalities. The area searched is 50 m with correction factors for scavengers, searcher efficiency and unsearchable areas. Ms. McGuiness says that "the Bird and Bat Guidelines are adaptive and will be improved, as necessary, in light of emerging science."

[408] Ms. McGuiness also testified with respect to the Wind Energy Bird and Bat Monitoring Database. One of the purposes of collecting bird and bat mortality data in the database is to evaluate cumulative impacts of wind farm development on birds and bats and make changes to the Bird and Bat Guidelines. In turn, under condition 12(1) of the REA for the Project, the EEMP and EIS are to be updated if there are changes to the Guidelines.

[409] Ms. McGuiness testified that the bird and bat mortality thresholds are not intended to address population level impacts. Instead, they are designed to weed out "outlier" turbines. It was her evidence that even if mortality rates are at the Guideline thresholds, this would not cause population level impacts to birds.

[410] Eric Prevost, an MNR employee who reviews reports required in REA applications including the NHA, EIS and EEMP, testified on behalf of the MOE. Mr. Prevost did not review the reports associated with this application; his colleague, Erin Cotnam, did so. He testified that in his view, they were complete.

[411] Both Mr. Prevost and Ms.McGuiness testified that the MNR considers an IBA to be a "coarse screening tool", as not all areas in an IBA will be significant wildlife habitat as IBAs often contain towns and industrial areas.

Ms. Laplante and Mr. Baxter

[412] Testimony relating to Melissa Laplante and Andy Baxter is noted above, under the section on Blanding's turtle. Regarding the Ostrander Crown Land Block, Ms. Laplante testified that of the seven species noted as "possibly occurring or utilizing the site", four were protected at the time under the *ESA* (Blanding's turtle, Eastern Whip-poor-will, Golden Eagle, and Peregrine Falcon), and three others were listed as being of special concern under the *ESA* or Species at Risk in Ontario List: the Bald Eagle, Golden-Winged Warbler, and Short-eared Owl. The determination of which species required an *ESA* Permit was based on a records review, information provided by the Approval Holder's consultants, and information provided from the Site itself.

[413] Regarding birds at Ostrander Point, Ms. Laplante said that MNR required the Approval Holder to produce surveys for Eastern Whip-poor-will and Golden Eagle. Detailed breeding surveys for Henslow's Sparrow had already been conducted at Ostrander Point. The MNR then determined that Blanding's turtle (discussed above), and the Eastern Whip-poor-will and its habitat would be adversely impacted by the proposed Project, and recommended that the Approval Holder apply for an *ESA* Permit for those two species.

Approval Holder's witnesses

Dr. Strickland

[414] Dr. Dale Strickland was qualified on behalf of the Approval Holder as an expert in the impacts of wind farms on birds. He holds a PhD in Zoology from the University of Wyoming and an M.S. in Wildlife Management from the University of Tennessee.

[415] Dr. Strickland said that when studying impacts of wind farms on birds, he looked for a biologically significant impact on a population at a regional level and whether it can remain viable. He noted the relatively small size of the Project in terms of its area and the number of turbines. In his opinion, the Project will not cause a population impact on breeding birds, has a low potential to have a significant impact on aerial insectivore populations, the fatality rate will not have any measurable effect on night migrating songbirds, and there will be no effect on raptor populations. Also in Dr. Strickland's opinion, Swallow and Purple Martin fatalities at the Project will be lower than at Wolfe Island because the Stantec surveys indicate low use of the proposed Project area during fall migration.

[416] Regarding the IBA, Dr. Strickland concluded that due to the low number of expected bird fatalities, the very small proportion of land area within the IBA affected by the Project, and the Approval Holder's commitment to mitigate high levels of avian

fatalities, the Project is unlikely to cause any significant impacts. Regarding waterfowl specifically, Dr. Strickland said that he did not believe that the Project would affect them because they concentrate off shore and are not particularly susceptible to collision with wind turbines. He concluded that the Project would have no measurable effect on the IBA.

[417] Regarding habitat loss for birds, Dr. Strickland concluded that the Project might displace some local birds, but because of its small size and the Approval Holder's commitment to mitigate any significant displacement, there would be no serious and irreversible impact to the breeding bird populations. With respect to the compensation property, Dr. Strickland's understanding was that the plan is to manage the property to maximize its benefits for those two species, Eastern Whip-poor-will and Blanding's turtle, but that other species will benefit from the stewardship of the area. As a result there is a potential for a complete replacement of the habitat that might be lost on the Project Site, and perhaps an enhancement of habitat for those two species in the general area. Dr. Strickland agreed with Dr. Kerlinger that construction should take place between October 15 and May 1, outside the bird breeding season.

Dr. Paul Kerlinger

[418] Dr. Kerlinger was qualified as an expert in the impacts of wind farms on birds. He holds a Master's degree and Ph.D. in Biology from the State University of New York at Albany. He has done more than 75 risk assessments for wind power projects in the United States, Puerto Rico, Mexico and Spain. He designed the work, analyzed the data and wrote the report on the Maple Ridge wind project, which is one of the closest wind projects to Ostrander Point. He has conducted 20 post-construction impact studies.

[419] Dr. Kerlinger stated that displacement impacts involve individuals of a species being disturbed, or their habitat altered or removed, resulting in their moving away from wind turbines so that the population is less dense close to the turbines. He indicated that there are few "empirically demonstrated" displacement cases, that the impacts have not been strictly quantified, and that they are "species specific".

[420] Dr. Kerlinger stated that collision impacts involve birds flying into turbine components, such as the blade, nacelle or tower. He indicated that average fatality rates on a per turbine basis are roughly 4 to 7 birds per turbine per year. However, he stated that there have been higher fatality rates of about 15 birds per turbine per year at two projects for which research is ongoing, one of which is Wolfe Island in Ontario. He indicated that as turbines have become taller, fatality rates have slightly increased. He testified that, to date, "fatality studies at more than 50 wind plants in the U.S. and

Canada have failed to demonstrate impacts that would cause a serious and irreversible harm to populations of the bird species involved". He added that wind turbine bird fatality rates are minimal in comparison with other types of collision (e.g., windows - 550 million, and car/trucks - 80 million, annually), and that cats cause hundreds of millions of bird deaths annually.

[421] Dr. Kerlinger agreed that a wide variety of species, and large numbers of individual birds, are found at, or pass through, the Prince Edward County Peninsula. He said this includes migrating concentrations of raptors and songbirds, and that waterfowl and marsh birds gather in the offshore, coastal and wetland areas.

[422] Dr. Kerlinger stated that among the REA mitigation measures, the most important are the mortality thresholds and prevention requirements. He is of the opinion that the bird mortality threshold levels "will not cause serious and irreversible harm to birds" and will not be met or exceeded during the operation of the Project. He also said that limiting the construction dates to periods outside the nesting season (May 1 to October 15) will minimize impacts to nesting birds. He added that turbines will not be built within 200 m of the lakeshore and the *ESA* Permit for the threatened Eastern Whip-poor-will contains additional conditions.

[423] Dr. Kerlinger stated that there is "no reason to believe that the Project will cause serious and irreversible harm to populations of birds that nest, winter, or migrate through the Project area". He indicates that the project is small and covers a relatively small amount of land, and that even if the number of birds killed per turbine per year is the same as the highest fatality rates in North America, namely around 14 per turbine at Wolfe Island, the total number killed would amount to less than 135 individuals across one or two dozen or more abundant and resilient species. He states that such impacts have not been demonstrated to result in population level impacts to any species.

[424] Dr. Kerlinger used the scientific term "biological significance", i.e., "impacts that cause population decline". It is his opinion that an impact that causes a significant decline in the population of a species can be construed as being serious and irreversible. Dr. Kerlinger states that, from a biological perspective, bird populations extend well beyond the area of a project and are examined on a regional basis to determine population impacts. For the Project, the regional area for many species would include other parts of Ontario, upstate New York and parts of Quebec. In his opinion, the bird fatalities at Ostrander Point are not likely to reach biologically significant numbers.

[425] Dr. Kerlinger indicated that, of the 17 "species at risk" that occur at Ostrander Point/Prince Edward Peninsula, only the Whip-poor-will nests on or near the Site. He

added that the populations for species that nest at or around the site generally exceed one million individuals in North America.

[426] Dr. Kerlinger does not agree with Mr. Evans' statement that the cumulative impact of the Project and others along the north shoreline of Lake Ontario and Lake Erie can be "expected to have serious and irreversible effects on the Ontario populations of a number of species of aerial insectivores", for example, Purple Martins, Tree Swallows, Chimney Swifts, or Common Nighthawks. Dr. Kerlinger states that none of these species is currently endangered or threatened.

[427] For example, there are 11 million Purple Martins in North America and about 90,000 in Ontario. Although the Ontario population is declining, Dr. Kerlinger states the birds are not in danger of extinction and wind turbines are not causing serious and irreversible harm to any population. He states that there is no evidence that Purple Martin populations are threatened by wind turbines in the fatality database. He indicates that fatalities have occurred only at Wolfe Island, where 13 carcasses were found in the first 2.5 years of studies.

[428] Dr. Kerlinger stated that Mr. Evans' claim that the Project will have the highest fatality rates per MW for night migrating songbirds and raptors in North America is not substantiated by quantitative analysis or presentation of data.

[429] Dr. Kerlinger disagreed with Mr. Okines' evidence that the abundance of birds in the PEPtBO count is representative of the entire PECSS IBA; Mr. Okines was extrapolating from a small area at the tip of the peninsula to an area tens of kilometers away to the southwest, where the habitat and topography are different. Dr. Kerlinger stated that the radar studies show that migration at the east end of Lake Ontario is a broad front and not funneled through the Prince Edward County Peninsula.

[430] With respect to the Golden Eagle, Dr. Kerlinger testified the Ostrander Point project would not cause serious and irreversible harm because it migrates closer to the tip of the peninsula, and to date there is not one reported collision at a wind project on the Appalachian ridges, where hundreds and hundreds of Golden Eagles migrate. He clarified that a number of Golden Eagles are killed at the Altamont Pass project in California each year. However, he noted Altamont was not a migration corridor, but rather one of most abundant feeding sites for Golden Eagles.

[431] When it was pointed out to Dr. Kerlinger that a memo from Stantec to the MNR mentioned 10 Golden Eagle sightings at the Project Site, 100 m above ground, he agreed that they were within the rotor zone of a turbine.

[432] Dr. Kerlinger testified that, to see collision rates similar to Altamont, the Ostrander Point project would have to experience a mortality level of 2.5 eagles per turbine per year, which for 9 turbines would be 22 per year. The REA condition, however, requires that it can have no more than 2 raptor fatalities per year per project. The project must operate in accordance with the conditions.

[433] Regarding the scale of population, Dr. Kerlinger said populations are fluid. Birds that nest in Ontario, for example, could be derived from birds nesting in New York or Quebec because these birds disperse at the end of their breeding season. Maps do not show population movement or dispersal distances, so the original area that Dr. Kerlinger would include if looking at a population impact would be the continuous breeding areas of species that nest at Ostrander, that might extend out for 50 or 100 miles in any direction, or possibly further depending on species and dispersal distances. He added that a "population" at Ostrander Point could be a series of populations or sub-populations that go out long distances because it is a year round area with many migrants.

[434] Dr. Kerlinger discussed the utility of a population viability analysis to determine whether impacts are significant to those populations.

[435] For the Whip-poor-will, the population at Ostrander Point could extend as far as Sudbury, farther northwest or possibly into Quebec as far as Quebec City. They could also be birds from across Lake Ontario that might disperse northward toward the end of summer.

Dr. Voltura

[436] Dr. Voltura was qualified as an expert in bird behaviour and avian radar systems.

[437] Dr. Voltura is the Director of Wind Energy and Avian Systems for DeTect, which manufactures the MERLIN avian radar system referred to in condition I19 of the REA. Dr. Voltura explained that the system continuously monitors "targets" (including birds and bats) in the horizontal and the vertical planes to give an altitude profile of all birds moving in an area. It also quantifies the number of birds in the area. This information is used to assess collision risk, and it is stored in a database that can be analyzed based on real-time and historical activity.

[438] With regard to the use of the MERLIN system in post-construction mitigation, Dr. Voltura stated that the system provides information about bird passage rates in the rotor swept zone. This information can be analyzed, together with other collision risk factors such as weather and visibility, to predict in real-time when high activity in the rotor swept

zone will occur. The turbines could then be curtailed or shut down during periods of high-risk.

Submissions

[439] PECFN focuses its submissions on its species at risk "declining population" argument. Because such species are already designated as being at risk, PECFN argues that evidence of a measurable further decline in the species' population proves "serious and irreversible" harm. PECFN argues that the area of the Site has many species of nesting birds, and, as part of the PECSS peninsula migratory bird highway, also has dense populations of migrating birds. PECFN says that the nesting and migratory birds include species at risk that will suffer further declines because of the Project. PECFN argues that bird mortality rates at the Project will be very high; much higher than the numbers estimated by the Approval Holder's bird consultants and experts. PECFN submits that this will cause further measurable declines in the population of such species as the Henslow's Sparrow, Loggerhead Shrike, Kirtland's Warbler, Purple Martin and Golden Eagle and, therefore, the second branch of the test is met. PECFN underscores that the Project should not be in this area as it is within the PECSS IBA designation, and "recognised as being globally important for the conservation of birds."

[440] The Director submits that the small size of the Project, the generally low mortality rates of birds associated with wind turbines, and the expert opinions, demonstrate that the Project operating in accordance with the REA will not cause serious and irreversible harm to birds through direct impacts. The Director submits that the Project has been thoroughly considered in the REA process, and the *ESA* process; potential impacts will be mitigated as much as possible; post-construction monitoring and mitigation will deal with actual impacts using an "adaptive management" approach; and the EEMP and EIS will be updated when there are changes to the Bird and Bat Guidelines.

[441] The Approval Holder submits that PECFN has not shown that the Project will cause serious and irreversible harm despite the REA conditions and required mitigation measures contained in the various documents incorporated into the REA and the ESA permits. The Approval Holder further submits that PECFN has not brought evidence that reaches the high level of certainty of the "will cause" phrase in the test.

[442] The submissions of the Approval Holder and the Director rely upon a "population viability" interpretation of the test, and they argue that the best evidence is that wind turbines do not, and this Project will not, have any effect on the viability of bird populations. They submit that the mortality thresholds act as a fail safe mechanism,

and that even if birds are killed at those levels, there will still be no impact on the viability of bird populations.

Analysis

Bird Species

[443] The expert bird witnesses for both sides substantially agree that a wide variety of species, and large numbers of individual birds, are found at, or pass through, the Prince Edward County south shore peninsula. In addition, the "Ostrander Point Wind Energy Park Draft Environmental Review Report" and "The Bird Report, an Acadia Radar Study" prepared by the Approval Holder's consultant make it clear that birds heavily utilize Ostrander Point, and that some of the birds are migratory species and some breed in the area. The letter from Environment Canada describing the Site is pertinent. To repeat, it provides: "In terms of overall quality, it is one of the best areas for birds E C has seen in southern Ontario."

[444] The evidence of Mr. Cheskey was that the Project's infrastructure and its operation, would have a serious negative impact on breeding birds at the Site, grassland species in particular as they all have declining populations. Mr. Scott referenced the Whip-poor-will and the Henslow's Sparrow. His opinion is that there will be a terminal decline for the Henslow's Sparrow, a rare and endangered bird, through displacement and collision. However, his evidence was speculative in relation to the impact of wind turbines on these species.

[445] While there was evidence that eight Whip-poor-wills breed in the vicinity of the Project that could potentially be hit by the turbines, PECFN's evidence did not specifically challenge the efficacy of the Whip-poor-will *ESA* permit conditions, or argue that potential harm to this species meets the test at s.145.2.1 of the *EPA*.

[446] Mr. Evans also gave evidence regarding the Purple Martin, a species of aerial insectivore whose population is in decline in Ontario. He called the Project a potential population sink for this species, and said the number of potential mortalities has been underestimated. However, his conclusion was that it is "conceivable" that the cumulative impact of wind farms in Ontario will accelerate that decline.

[447] Mr. Okines and Mr. Evans gave the example of the Kirtland's Warbler as a species at risk that they allege migrates through the area. If one were to be killed by a turbine, they said that it would be catastrophic to the species. However, there are so few of them that they had not been recorded at PEPtBO. This is another example of a species possibly using the Site, but for whom there is simply a lack of evidence that the Project will cause them the required harm under the test.

[448] The witnesses of the Approval Holder testified that there was simply no evidence that the alleged level of harm will be caused to any of the species identified by the PECFN witnesses. For example: Dr. Strickland's evidence was that there would be no serious and irreversible impact to the breeding bird populations and that, in fact, the REA conditions will improve habitat in the area, possibly leading to benefits over and above current conditions, for more species than just the Whip-poor-will; and Dr. Kerlinger stated that there is no evidence that Purple Martin populations are threatened by wind turbines in the fatality database, except for a small number at the Wolfe Island wind turbine operation.

Bird mortality

[449] The mortality thresholds that trigger mitigation measures at the Project are: 14 birds per turbine per year at individual turbines or turbine groups, 2 raptors per wind power project per year, 10 or more birds at any one turbine during a single monitoring survey, 33 or more birds (including raptors) at multiple turbines during a single monitoring survey.

[450] Mr. Cheskey stated his opinion that the casualty rates from the Project would exceed the MNR thresholds based on the fact that there are no other wind projects built on a Great Lakes peninsula with natural habitat comparable to the Project, that shorelines are disproportionately important for birds, and the Project turbines would be located within 200 m of the shoreline. Mr. Evans' calculations of estimates supported the evidence that mortality rates for many species will likely be very high.

[451] However, even if Mr. Cheskey and Mr. Evans are correct, and Dr. Kerlinger has underestimated bird mortality rates, mitigation measures are triggered if the thresholds are met. The evidence of the expert witnesses of the Director and the Approval Holder that meeting the mortality thresholds will generally not impact bird populations was very strong. The possible exception is impacts to species at risk, depending on the evidence. As Mr. Scott testified, it would be a mistake to assume that only resilient species will be impacted.

[452] Mr. Cheskey testified that mortality rates would also increase because the turbines will only be 200 m from the shoreline. Dr. Kerlinger had prepared a study in 2007 in which he recommended a 400 m setback from Lake Erie in an area of IBAs. Dr. Kerlinger explained that this was a compromise distance. The parties did not provide the Tribunal with any additional evidence as to whether 200 m would be the appropriate setback distance in this case.

[453] To repeat, Dr. Strickland's succinct opinion on the matter of bird mortality is that, given: "the low number of expected bird fatalities, the very small proportion of land area

within the IBA affected by the Project, and the Approval Holder's commitment to mitigate high levels of avian fatalities, the Project is unlikely to cause any significant impacts" on bird populations.

[454] Dr. Strickland and Dr. Kerlinger have expertise in the specific area of wind turbine impacts on bird populations and mortality. While PECFN questioned whether Dr. Kerlinger was free from bias, no such allegations were raised with Dr. Strickland. While Mr. Cheskey and Mr. Okines have extensive familiarity with the south shore of Prince Edward County and the birds that are found there, they lack the same level of authority with respect to turbine mortality impacts on birds.

[455] PECFN's witnesses raised concerns that collision mortality for all species of birds at the Ostrander Point wind energy park would exceed the mortality thresholds outlined in the MNR's Bird Guidelines, but they did not take into account the mitigation measures outlined in the REA that would be triggered if the thresholds are breached. None of the witnesses testified that, if the proposed Project operates within the mortality thresholds, it will cause serious and irreversible harm to species that are not at risk.

[456] Mitigation measures for the Project relating to birds include mortality monitoring (contained in the EEMP), mortality thresholds that trigger mitigation mechanisms such as blade feathering and shut down of individual turbines, a radar early detection system, and a 200 m set-back from Lake Ontario. Dr. Kerlinger stated that among the REA mitigation measures, the most important are the mortality thresholds and prevention requirements.

[457] The Tribunal considers the mitigation measures for birds in the REA to be part of the consideration of "engaging in the Project in accordance with the REA".

[458] The proposed MERLIN radar system, and whether it will prevent bird collisions was controversial. Dr. Voltura explained the operation of the MERLIN radar system. Mr. Scott testified that the "technology is in its infancy" and that it has not been proven to be helpful to prevent collisions, although it is useful for mapping and recording bird activity.

[459] Regarding mitigation, the Scottish Document poses the questions:

> Are the mitigation measures deliverable. Will mitigation for one natural heritage aspect impact on another? Has the mitigation been tried anywhere else before, if so what was the outcome? Is there a need for the mitigation to be implemented and its effectiveness demonstrated before the windfarm is built? What monitoring will be undertaken and how will it inform management decisions?

[460] Even if the answers to some of the above questions are not clear in this case, e.g., the details of some of the other mitigation measures have not been fully planned yet, the statutory onus at this appeal stage in the process is on the appellant to prove that engaging in the Project in accordance with the REA will cause the requisite harm. The Tribunal finds that the PECFN has not proven that the mitigation measures incorporated into the REA regarding birds are so deficient that the Project will cause "serious and irreversible harm".

[461] For the reasons in this section and the immediately preceding one, the Tribunal finds that PECFN has not shown that engaging in the Project in accordance with the REA will cause serious and irreversible direct harm to populations of bird species.

Bird habitat

[462] The Project will cause some direct harm to bird habitat on the Site, e.g., where the turbine infrastructure will be constructed, and in the air space above, and have indirect effects to some bird species in the immediate vicinity, e.g., displacement. However, as the Director and the Approval Holder emphasize, it is an important fact in relation to bird species that the Project is for a small number of turbines that cover a relatively small area. The evidence demonstrates that, with mitigation, such harm in relation to birds will not be extensive, i.e., not serious and irreversible.

[463] There is strong evidence that the Site is in a major migration highway for birds. Mr. Okines' estimates of the number of migratory birds that use the Site, and fly over it, as part of the PECSS peninsula is based on years of his "hands on" experience with birds in the area, including the use of radar data. Mr. Cheskey is particularly knowledgeable about the PECSS IBA. He also referred to the Environmental Commissioner of Ontario's recommendation that IBAs should be an "exclusion zone for wind energy projects" and other industrial uses. Mr. Scott gave an international perspective. While acknowledging that the Project is for a relatively small number of turbines, in his opinion the Project would be located in an important migration "bottleneck" in the region. It was also his opinion that it is wholly unsafe to assume that "the species impacted would be primarily abundant and resilient species".

[464] Dr. Kerlinger disputed that the area is a funnel for bird migration, but he confirmed dense migration in the area. His evidence was based on some studies and not any first hand experience.

[465] The evidence shows, on balance, that migratory birds use the entire shoreline of the PECSS peninsula, that it provides staging and landing areas for them and has wetlands that provide food sources.

[466] The peninsula has been designated as the PECSS IBA on the basis of waterfowl and the evidence is that waterfowl would not be impacted by the Project to any great degree

[467] The MOE witnesses, Mr. Prevost and Ms. McGuiness, described an IBA as a "coarse screening tool" as "not all areas in an IBA will be significant wildlife habitat as IBAs often contain towns and industrial areas." However, the PECSS IBA does not have that kind of development.

[468] Dr. Kerlinger has done work for the Audubon society, which supports the policy that wind power should not be in IBAs or major migratory bird corridors.

[469] Mr. Scott's evidence was that there are a variety of migratory waterfowl and shore birds species that are linked to the area of the IBA. However, as noted above, there is no dispute in the evidence that the Project would not have any significant direct mortality impacts on waterfowl and that they would not be impacted in any significant way by the Project's turbines and infrastructure.

[470] The Scottish Document makes the following observations regarding migratory bird populations and their habitat (emphasis added):

> For migratory species, patterns of migration may determine the spatial framework within which impacts should be considered. For example, corncrake migrate up the west coast of Ireland and Scotland and <u>any impacts during migration</u> throughout that wider region <u>would be likely to affect the population as a whole</u>.

[471] In relation to migratory birds that are species at risk, the definition of "habitat" in s. 2.(1) of the *ESA* includes (emphasis added): "an area on which the species depends, directly or indirectly, to carry on its life processes, including life processes such as reproduction, rearing, hibernation, <u>migration or feeding</u>." The evidence of all of the experts is that the PECSS peninsula, including the Site, is used by migratory birds for their life processes.

[472] It is also clear from the evidence of all of the experts that the migratory pathway extends both along the shore of the peninsula in an east-west direction, and across the peninsula in a north-south direction for birds not dissuaded from crossing Lake Ontario. The Tribunal accepts the evidence of the PECFN witnesses that this migratory pathway is heavily used and very important to the life processes of numerous species, and numbers, of migratory birds.

[473] The turbines will be 135 m in height and will sweep an estimated area of 7854 m^2 of air space at a height that migratory birds pass through in a shoreline area such as this. Four of the turbines will be 200 m from the shoreline. The shoreline area of the

Site includes migratory bird landing and staging area. The Site is in the middle of the PECSS peninsula migratory bird corridor, between two protected areas. There is also evidence that the Approval Holder's expert, in a study that he prepared in relation to a wind project on the shore of Lake Erie, recommended a greater setback distance than 200 m from the Lake Erie shoreline as a compromise, partly because the project was in the vicinity of IBAs.

[474] At its highest, the evidence is that the Project might cause harm to migratory bird habitat, but not that it will cause such harm. The Tribunal finds that the evidence does not attain the level of "serious and irreversible harm" to bird habitat within the meaning of the statutory test.

Conclusion

[475] The Tribunal finds that PECFN has not met the statutory onus of proving that engaging in the Project in accordance with the REA will cause serious and irreversible harm to birds or their habitat.

Bats

[476] PECFN alleges that engaging in the Project in accordance with the REA will cause serious and irreversible harm to bats. The Tribunal heard evidence from three experts on bats: Dr. Barclay for the Appellants, Dr. Fenton for the Approval Holder, and Fiona McGuiness, biologist with the MNR, who testified on behalf of the Director with respect to the MNR's Bat Guidelines.

[477] There are eight species of bats known to occur regularly in Ontario, all of which have a range that overlaps the Ostrander Point Crown Land Block: big brown bat, hoary bat, silver-haired bat, eastern pipistelle, red bat, little brown bat, northern long-eared bat, and small-footed bat. The majority of them are currently considered endangered in Ontario.

[478] The experts agree that the greatest threat to the survival of Ontario's hibernating bats is white-nosed syndrome, a fungal infection that wipes out entire hibernacula. The experts also agree that there is very little scientific research available on the impact of wind turbines on bats, partly because bats are extremely difficult to study. There have been some cases found of large-scale bat deaths through turbine collisions.

[479] Where the experts disagree is relating to the effectiveness of bat mortality mitigation measures, and the effectiveness of the Bat Guideline's threshold of 10 bat mortalities per turbine per year.

Stantec's Bat Report

[480] Stantec prepared the Ostrander Point Wind Energy Park Acoustic Bat Monitoring Report (the "Bat Report") as part of the NHA/EIS. When the Bat Report was prepared in January 2010, no bats in Ontario were considered to be at risk by the federal agency COSEWIC, or the Committee on the Status of Species at Risk in Ontario ("COSSARO"), although the Report notes the eastern pipistrelle and the northern long-eared bat were ranked vulnerable in the province, and the small-footed bat was ranked vulnerable to imperiled. Since that time, however, the status of the little brown bat and the northern long-eared bat has changed to endangered in Ontario.

[481] The Bat Report highlights that effects to bats due to wind power facilities may be either direct (through injury or death by collision) or indirect (displacement or population declines) and that the majority of bat fatalities at wind power facilities occur in the late summer and fall. The Bat Report identifies the long-distance migratory bats (i.e., hoary bat, eastern red bat, and silver-haired bat) to be most vulnerable to collisions with moving turbine blades.

[482] Stantec undertook acoustic bat monitoring in July, August and September 2008 and in July and August 2009. The Bat Report relied on a pre-construction monitoring program that consisted of acoustic monitoring at four stations within the Project Area. Station "SW" was located approximately 50 m from the shoreline in a tree approximately 4 m above the ground, stations "MET-High" (30 m height in 2008, 40 m height in 2009) and "MET-Low" (15 m height) were located approximately 650 m from the shoreline on the existing meteorological tower. Station NE was located approximately 1500 m from the shoreline in a tree approximately 4 m above the ground. Due to similarity of call signature between several species, the Bat Report categorised all calls into four guilds or species groups: the unknown guild, the Myotid guild, the Red bat/pipistrelle guild and the big brown/silver-haired and hoary bat guild.

[483] The Bat Report concluded that activity levels of long-distance migratory bats at the Project Site were not unusually high. The majority of hoary and silver-haired bats appeared to have passed through the Project area by the end of August. However, the eastern red bat was observed into mid-September, in lower numbers. The Bat Report concluded that higher overall bat activity was observed at detectors that were closer to the shoreline. The activity along the shoreline was likely indicative of foraging bats and high activity levels could have been caused by multiple detections of individual bats. The Bat Report reached the conclusion that the low bat activity levels at the elevated detector indicated that the majority of bat flight was occurring at lower elevations, below wind turbine blade sweep height.

Fiona McGuiness

[484] Ms. McGuiness testified as to the development of the Bird and Bat Guidelines, and explained that they are mandated by regulation. She testified that Ontario's Bird and Bat Guidelines are unique in North America in establishing mortality thresholds, upon which scoped monitoring and mitigation, including changes to operating procedures, are required. She also noted in her reply witness statement that the Bird and Bat Guidelines are adaptive, such that "if new science informs refined mortality estimates or methodologies, MNR's guidelines will be updated in cooperation with EC-CWS [Environment Canada – Canadian Wildlife Service]".

[485] The Bat Guidelines provide that mitigation measures are required where a wind turbine project reaches a mortality threshold of 10 bats /turbine /year, which translates roughly to 5-7 bats /mW /year. Ms. McGuiness testified that the threshold number was established by MNR science and wildlife biologists who looked at post-construction bat mortality data from existing wind turbine projects. She noted that a range of mortality was recorded, and that levels from some projects were quite high. Ms. McGuiness testified that 10 is "at the lower end of the mortality range", and considered a protective threshold "based on expert opinion". She agreed that population levels of bats are not well known.

[486] Ms. McGuiness acknowledged that the Guidelines provide a threshold on a per-turbine basis, rather than per-megawatt basis, and that as turbine sizes increase, it may have an impact on the effect of the thresholds. In her view, such effect would be marginal. She also acknowledged that the threshold applies across a project, as does mitigation. Thus, if only one turbine in a project was killing a large number of bats, but others were not, the result may be acceptable if it averaged out to 10 bats /turbine /year.

[487] Ms. McGuiness noted that non-migratory (resident) and migratory bats are both included in the bat mortality calculation that is evaluated against the bat mortality threshold. Should the bat mortality threshold in the Guidelines be exceeded, she stated, operational mitigation is required so that mortality is reduced. She noted that the mitigation prescribed is based on wind power mitigation research conducted by Baerwald et al. and Arnett et al. (cited below under Dr. Barclay's evidence).

Dr. Robert Barclay

[488] Dr. Barclay was qualified to provide opinion evidence as an expert in bats. Dr. Barclay is a Professor and the Head of the Biological Sciences Department at the University of Calgary.

[489] Dr. Barclay testified that he was generally encouraged by the quality of Stantec's Bat Report, given that it used a number of monitoring sites including one microphone at elevation, and given that it took place for more than one season. However, he testified that in his view, the methodology of the Bat Report underestimates potential fatalities for migratory and non-migratory bats.

[490] With respect to migratory bats, Dr. Barclay opined that the elevated microphone should have been the one closest to the shoreline. The Bat Report indicated that the highest proportion of migratory bats was detected at the elevated microphones compared to the ground level microphones. Dr. Barclay noted that this reflects the fact that migratory bats generally fly higher than resident hibernating bats, with a higher activity level in the blade-swept area of turbines. This explains why migratory bats generally account for the highest number of bat fatalities at wind turbines. Dr. Barclay pointed out that the Bat Report acknowledged that the migrating bats often travel along shorelines yet the detector site closest to the shoreline did not have an elevated detector activity of migratory bats. As such, the Bat Report underestimated the activity of migratory bats. He indicated that the geography of the site suggested that migratory bats were likely to fly through the wind-facility area, particularly along the shoreline of the lake, as they migrated south during late summer and fall. He stated that bats also use lakeshores as navigation routes, and Ostrander Point site was likely to be used in that way.

[491] Secondly, he noted that no recordings were made in September 2009 while relatively high activity of migratory bats was recorded in September 2008, indicating that activity levels may have been under-estimated.

[492] Finally, he noted, the Bat Report's conclusion, that the activity of long-distance migratory bats was not unusually high, implied that the activity levels recorded by the study were compared to those of other studies. However, there were no other studies or data presented, and no comparisons were made.

[493] He added that even if the activity level was correct, there was a significant probability that bat fatality would exceed the 10 bats per turbine per year threshold set by the MNR's Bat Guidelines. He explained that at three sites in Alberta where pass rates ranged from 3 to 8 per night the fatalities were between 22 – 32 bats per year; therefore, the 7.3 migratory bat passes per night at the Project Site was reason for concern.

[494] Dr. Barclay also stated that the Bat Report seemed to have ignored, and hence underestimated the potential fatalities for, non-migratory species of bats which make up

a significant proportion of fatalities at wind facilities. He noted that the activity of non-migratory species such as various *Myotis* was high according to the Bat Report.

[495] Dr. Barclay explained that the Bat Report placed call results into four bat categories, including one that was labelled “big brown/silver-haired/hoary”. He noted that big-brown and silver-haired bats are difficult to distinguish on the basis of their echolocation calls, with the difficulty increasing with height of the bats from the ground. Because of these limitations, Dr. Barclay questioned the conclusion of the Bat Report which determined that the majority of call sequences in the “big brown/silver-haired/hoary” category belonged to the big brown bats. Big brown bats are resident hibernating bats, while silver-haired/hoary bats are migratory. He noted that the pattern of activity peaks in August and September were indicative of migrating bats not of non-migratory species such as big brown bats.

[496] Dr. Barclay re-calculated the bats in the mixed category as if they were all migratory, silver haired bats, and came up with an average of 7.3 passes per night. Dr. Barclay compared these figures to the mean migratory activity and mean fatality rate in three sites in Alberta in his study with Erin F. Baerwald, “Geographic Variations in Activity and Fatality of Migratory Bats at Wind Energy Facilities”, published in the *Journal of Mammalogy*. At the three sites in that study, the mean fatality rate was 32 bats per turbine per year, 23 bats per turbine per year, and 21 bats per turbine per year. Dr. Barclay concluded that the potential for bat fatalities at Ostrander Point to exceed 10 bats per turbine per year is significant, especially given the likelihood of underestimating the actual activity levels.

[497] Dr. Barclay noted that if the “big brown/silver-haired/hoary” activity at the elevated detector was indeed mostly big brown bats, then the fatality rate of these bats was likely to exceed the 10 bats per turbine per year threshold as the bats were flying within the blade-swept area.

[498] During cross-examination, Dr. Barclay was referred to his article "A Large-Scale Mitigation Experiment to Reduce Bat Fatalities at Wind Energy Facilities", which looked at the potential effect of mitigation measures, namely changing the wind cut-in speed and blade feathering, associated with the operation of wind turbines. Dr. Barclay acknowledged that the experimental turbines showed an approximately 60 per cent reduced fatality rate. He also stated that his opinions and conclusions were based on the activity levels reported in the Bat Report and the subsequent fatality rate predictions that stemmed from those.

[499] With respect to indirect impacts of wind turbines on bats, Dr. Barclay testified that there were a number of studies that indicated that bats avoided areas with high noise

levels such as roadways and one method that had been tested to scare bats away from turbines was to produce a very loud sound that they could hear. The current data available did not permit any conclusions on the possibility of habitat alteration from wind turbines.

[500] Dr. Barclay had some comments on the Bat Guidelines. He stated that the threshold of 10 bats per turbine fatality rate was arbitrary and did not take into account cumulative effects of all the wind facilities that particular populations of these species encountered. He noted that there were two to four other proposed wind farms around Ostrander Point with many more turbines than at Ostrander Point. He said the cumulative effects of all of those wind projects, each allowed to kill 10 bats per turbine per year on average without mitigation, would have a much different effect on those populations that Ostrander Point taken in isolation. He noted that British Columbia's draft threshold is 7 bats per turbine while in the United States, the thresholds vary from 1 in Hawaii, where there is a single species of bat, to 3 migratory bats in West Virginia, to 26 in Pennsylvania's draft guidelines.

Dr. Reynolds

[501] Dr. Reynolds was qualified as an expert in the impact of wind farms on bats. He is a population biologist by training with a PhD in the physiological ecology of bats, and has been conducting research and working with the impact of wind turbines on bats since 2003.

[502] Dr. Reynolds agreed with much of the testimony of Dr. Barclay, except with respect to his ultimate conclusion. Dr. Reynolds testified that the Ostrander Point Project will not cause serious and irreversible harm to bat populations, taking the mitigation measures into account.

[503] Dr. Reynolds noted that two of the non-migratory bat species, little brown and northern long-eared, have had their populations decimated in the last few years due to white-nose syndrome. As a result there are few bats around to be impacted by wind projects.

[504] Dr. Reynolds noted in his witness statement:

> Mortality rates at wind projects throughout North America vary substantially, with a range of 0.3 bats per turbine per year up to 63.9 bats per turbine per year. Although the determination of relative risk is somewhat imprecise in the absence of site-specific population densities for each species, it is clear that some species are being killed at a higher rate than would be predicted based on their abundance determined from capture surveys. Post-construction mortality surveys throughout North America show that the non-hibernating migratory tree bats (hoary bat *Lasiurus cinereus*, red bat *L. borealis*, and silver-haired bat *Lasionycteris*

> *noctivagans*) are more susceptible to wind turbines than are hibernating bats.

[505] He acknowledges that "part of the difficulty in determining the impact of wind development on bat populations is the absence of baseline population surveys or knowledge of migratory behaviour in bats." Most bat mortality, it has been shown, occurs in August when the migratory bats would begin their fall migration.

[506] Dr. Reynolds noted that wind development presents up to four potential negative impacts to bats: collision mortality; loss of roosting and foraging habitat; "barrier effect" to movement across a landscape; and interference with echo-location. He testified that there is no real evidence to suggest that barrier effects or acoustic interference has any significant ecological effect.

[507] With respect to habitat destruction, it is possible that bats could be killed as a result of construction activities if their roosting sites are destroyed while they are roosting. However, he testified that construction activities are unlikely to have any direct impact on bats in this case, as no caves or mines are known to exist on, or in the vicinity of, the Subject Property, and the Stantec EIS Report concluded that features that support small maternity colonies of bats were limited or absent on the Site. Dr. Reynolds also visited the Site, and agreed with that finding. Further, bats in this region are habitat generalists, and Dr. Reynolds concludes that it is unlikely that any avoidance would impact their ecology.

[508] With respect to direct impact, he testified that the largest source is mortality resulting from bats colliding with rotating blades while they are foraging, commuting or migrating. Most bat activity and bat mortality occurs at low wind speeds. Dr. Reynolds testified that the mitigation technique of stopping or feathering the turbine blade at wind speeds of less than 5.5 m/s has been shown to be effective at significantly reducing bat mortality, by 50 to 80 per cent. Dr. Reynolds noted the conditions of this REA, which require such operational curtailment.

[509] Overall, Dr. Reynolds was impressed by the science-based conditions related to bats in the Ostrander Point REA. He noted in his witness statement that mitigation research has not been consistently incorporated into siting permits for wind development in some jurisdictions, and "this inconsistency has the potential to create wind development in areas that are politically expedient rather than ecologically appropriate. This would appear to be the worst way to develop wind potential." With respect to the bat mitigation measures, he comments that the Ostrander Point REA is "one of the best science- and adaptive management-based approvals" he has seen.

[510] While Dr. Reynolds recognized that radar systems are unproven, he was nevertheless appreciative of the inclusion of measures related to radar early-detection, in an attempt to incorporate a pro-active response system, rather than simply a reactive one.

[511] Dr. Reynolds is fully confident that, even if the Project were to exceed the Bat Guidelines' threshold of 10 bats /turbine /year, the mitigation measures required of operational curtailment of the turbines below 5.5 m/s wind speed each night from July 15 – September 30 and an additional three years of post-construction monitoring, would prevent serious harm to bats.

Findings on Bats

[512] The Stantec Bat Report found that the Ostrander Point site is being used by all of the bat species found in Ontario, and the experts agreed it contains and abuts habitat for resident bats, and is in a migratory pathway. While there was some dispute as to the actual number of bats using the Site, this does not affect the Tribunal's finding.

[513] The impact of wind turbine projects on bats is an important question, given that seven of the eight bat species found in Ontario are endangered or threatened. However, it is clear that the biggest threat to hibernating bat populations currently is white-nose syndrome. Further, the experts in this proceeding focused on the question of collision mortality, rather than that of habitat loss.

[514] According to the studies conducted by Dr. Reynolds, there are very few good predictors of collision mortality other than weather, especially wind speed.

[515] Dr. Reynolds and Ms. McGuiness expressed confidence that, should mortality rates be found to be "high" (i.e., the Guideline threshold of 10 bats/turbine/year) through the regulated monitoring that will occur at this Site, the mitigation measures provided in the REA conditions would function to successfully avoid serious harm to bats. Dr. Barclay also acknowledged the effectiveness of feathering turbine blades at low wind speeds, to reduce bat collision mortality.

[516] The REA includes the following conditions with respect to bats:

> I4. The Company shall contact the Ministry of Natural Resources and the Director if any of the following bird and bat mortality thresholds, as stated in the Environmental Effects Monitoring Plan for Wildlife and Wildlife Habitat for the Ostrander Wind Energy Park described in Conditions I1 and I2(1), are reached or exceeded:
>
> (1) 10 bats per turbine per year;
>
> I5. If the bat mortality threshold described in Condition I4 (1) is reached or exceeded, the Company shall:

> (1) implement operational mitigation measures consistent with those described in the Ministry of Natural Resources publication entitled "Bats and Bat Habitats: Guidelines for Wind Power Projects" dated July 2011, as amended.
> (2) increase cut-in speed to 5.5 m/s or feather wind turbine blades when wind speeds are below 5.5 m/s between sunset and sunrise, from July 15 to September 30 at all turbines, for the operating life of the Facility; and
> (3) implement an additional three (3) years of effectiveness monitoring.
>
> I6. If the bat mortality threshold described in Condition I4(1) is reached or exceeded after operational mitigation is implemented in accordance with Condition I5, the Company shall prepare and implement a contingency plan, in consultation with the Ministry of Natural Resources, to address mitigation actions.

[517] The Tribunal is cognizant of Dr. Barclay's concern that the threshold of 10 bats/turbine/year is arbitrary and not based on science. Indeed, there appears be no method of calculating a number of bat fatalities that would constitute serious and irreversible harm, both due to the difficulties inherent in estimating the size of bat populations, and given the numerous other factors involved in estimating the impact of one type of development on a population. The Tribunal therefore declines to comment on whether such a fatality rate would constitute serious and irreversible harm to bats. The number of 10 operates as a red flag to the Approval Holder and the MOE, to indicate there are "significant levels of mortality upon which mitigation is required to reduce to below those levels", according to Ms. McGuiness.

[518] The evidence is strong that the mitigation measures of increasing the turbine cut-in speed to 5.5 m/s, during the season when migrating bats are present in the spring and fall, and during the time of day (evening and sunrise) when bats are active, is effective at significantly reducing the risk of collision mortality. In Ms. McGuiness's words, the mitigation measures for bat collision mortality have been shown scientifically, through Dr. Reynolds' work, to be "sure-fire". The Tribunal accepts Dr. Reynold's opinion that, with these mitigation measures in place, the Project as approved will not cause serious and irreversible harm to bats.

[519] There was simply insufficient evidence presented to the Tribunal that wind turbine projects negatively impact bat habitat on the Project Site.

[520] The Tribunal concludes, therefore, that PECFN has not established that engaging in the Project in accordance with the REA, will cause serious and irreversible harm to bats.

Butterflies

Donald Davis

[521] The Tribunal heard from Donald Davis on behalf of the appellant, with respect to Monarch butterflies. Mr. Davis is a citizen scientist with Monarch Watch, who has devoted many hours to the study, tagging and monitoring of Monarch butterflies, and been consulted on documentaries about the species. He was recognized by the Tribunal as an expert on Monarch butterfly migration, breeding and habitat.

[522] Mr. Davis has been studying and tagging Monarch butterflies since 1967 with the Insect Migration Association. He has been authorized by the MNR to collect and band Monarch butterflies. Since 1985, he has been tagging Monarch butterflies at Presqu'ile Provincial Park. He was a co-author of the North American Monarch Conservation Plan and has served as a technical reviewer of scientific publications on the Monarch. He is the Secretary of the Monarch Butterfly Fund, a U.S. based non-profit organization which supported reforestation and scientific projects.

[523] Mr. Davis explained that Monarch butterflies require four different habitats, i.e., overwintering habitat, nectaring habitat for food, milkweed for breeding, and staging areas during migration. In his opinion, the Project would cause "irreversible harm to the site and to Monarch butterflies" mainly because of its removal of breeding habitat due to construction of the Project components.

[524] He said there are three International Monarch Butterfly Reserves in Ontario: Long Point, Point Pelee and Prince Edward Point National Wildlife Area, which is close to the Project area. Mr. Davis added that international recognition was given to the Prince Edward County Wildlife Area in the 1990s and a plaque was erected to designate the area under the International Network of Monarch Butterfly Reserves. In his opinion, the Project would disrupt numerous ecosystems in the area and seasonal patterns, of which the Monarch butterfly was one affected species.

[525] Mr. Davis stated that the Monarch butterfly was listed both provincially under the *ESA* and federally as a species of "Special Concern" and that permits were required from the MNR for breeding, tagging and other research projects.

[526] Mr. Davis explained that as a summer resident, Monarchs were part of the local ecosystem contributing as pollinators and that various life forms of the Monarch, i.e,. egg, larva, pupa and adult forms) were food for many parasites and invertebrate species. He said that milkweed was the sole food source for Monarch caterpillars which was a host plant for numerous other invertebrates. Mr. Davis stated that the decline in

the amount of available milkweed had been one factor in the general decline of the Monarch population.

[527] In his opinion, the construction of the Project would result in irreversible harm to the Site and to the Monarchs. He stated that the Site had an abundance of nectar sources and flower sources for the Monarchs to nectar on as well as an abundance of milkweed on which they reproduced; and that the construction of the project would remove the amount of breeding habitat available which was a serious problem, particularly, in light of the low numbers coming back to Canada from Mexico this year.

[528] Mr. Davis stated that historic evidence indicated that the lands of Prince Edward County were a significant migratory pathway for many insects and other animal forms. He said that large numbers of Monarchs, arriving from the east and north stop to nectar on available nectar sources and rest for the night in adjacent trees, to continue to migrate in a south-westerly direction, passing through Prince Edward County towards their wintering grounds in Mexico. He pointed out that very large clustering might not happen or be seen every year.

[529] Mr. Davis was doubtful that Chip Taylor, a Monarch expert with whom Mr. Davis has corresponded, would have made a comment attributed to him in the Design and Operations Report, that southern Ontario did not host significant thousands of Monarchs that regularly occurred at the three main staging areas.

[530] Mr. Davis also disagreed with the statement in the Design and Operations Report that the majority of migrating Monarchs in Ontario used the Point Pelee, Long Point and Presqu'ile Point staging areas. He said Presqu'ile Point was not a staging area but that Presqu'ile Provincial Park was and that there was no literature to substantiate this statement that the majority of the Monarchs used these three areas. Similarly he said the statement that most of the eastern Ontario population of Monarch were believed to cross Lake Ontario from Presqu'ile Point staging area was unsubstantiated. He added that while these areas were important Monarch staging areas, Monarchs used many other staging areas along the north shores of Lake Ontario and Lake Erie. He pointed out that the statement that Prince Edward Point was used to a lesser extent was not substantiated.

[531] Mr. Davis pointed to a table depicting the Monarch population status, published by Monarch Watch in March 2013, which shows the population counted in the Monarch's overwintering grounds in Mexico to be at its smallest recorded population since first being recorded, in 1975.

[532] Mr. Davis opined that more intensive, extensive investigations and observations needed to take place to confirm that the Project would not cause serious and irreversible harm to the species and ecosystems in question and specifically with regard to the Monarch Butterflies.

Jessica Linton

[533] Ms. Linton testified on behalf of the Approval Holder with respect to butterflies. She was recognized as an expert in butterfly habitat and behaviour.

[534] Ms. Linton testified that Monarch butterfly habitat is found throughout Ontario. While she agreed with Mr. Davis' assessment that the Site provides suitable stopover butterfly habitat, she testified that it was no better habitat than any other, along the south shore of Prince Edward County. She described Monarchs as "habitat generalists", in that they occur anywhere milkweed occurs; i.e., throughout southern Ontario. She agreed with Mr. Davis' evidence that the Monarch population has been in decline for the past several years, but testified that they are a very adaptable and resilient species. Ms. Linton noted that the Monarch population has rebounded from devastating population losses, such as one disastrous winter in Mexico when up to 80 per cent of the population was wiped out. She testified that the North Eastern population of Monarchs currently numbers around several hundred million.

[535] On cross-examination, Ms. Linton agreed that the Site is in a butterfly movement corridor, and that landforms such as the Great Lakes are used by Monarchs to guide their migration. Ms. Linton testified that Monarchs do not necessarily return to the same stopover areas every year, or even for several years in a row, which is why one only needs to determine whether a particular site provides suitable habitat. Ms. Linton agreed that the Ostrander Point Site does provide suitable habitat.

[536] She testified that, although the Site lies within the migratory pathway of the north shore of Lake Ontario, the 6 ha of habitat that is estimated will be lost at the Project Site is not a significant amount. Roosting will not be impacted by the turbines as the butterflies are close to the ground. Construction will not impact the butterflies as they are not present after September, and the REA conditions require that construction take place after October 15.

Finding on Butterflies

[537] Both experts agreed that indirect effects (i.e., habitat loss) is the only issue for butterflies arising from this wind energy project, and not direct effects (i.e., impact mortality).

[538] The Project Site includes suitable Monarch habitat, including milkweed. It is also in a migration corridor. While the footprint of the turbines, transformer station and additional access roads will remove approximately 6 ha of butterfly habitat, it has not been established that the presence of wind turbines will negatively impact Monarch butterfly habitat. The Tribunal accepts Ms. Linton's opinion, that 6 ha is not a significant amount due to the fact that Monarchs are resilient, adaptable habitat generalists, that are found throughout southern Ontario.

[539] Mr. Davis testified that in his opinion, more detailed studies are required to determine whether the Project will not cause harm to the species and ecosystems found at the Site. This falls short of the section 145.2.1 test, in which an appellant has the onus of establishing that engaging in the project in accordance with the REA will cause serious and irreversible harm to plant life, animal life or the natural environment.

[540] The Tribunal finds that PECFN has not established that engaging in the Project in accordance with the REA will cause serious and irreversible harm to Monarch butterflies.

Sub-issue 2: Whether engaging in the Project in accordance with the REA will cause serious and irreversible harm to plant life.

Alvar

1. Whether alvar is properly an issue before the Tribunal

[541] The Approval Holder argues that PECFN did not include harm to plant life in its Notice of Appeal, and therefore the Tribunal should disregard these portions of the appeal under Rule 28 of the Tribunal's Rules of Practice. In the alternative, the Approval Holder asks for an order for costs to "compensate the Approval Holder for the necessity of responding to these new issues without adequate notice".

[542] The Notice of Appeal filed by PECFN only makes reference to plant life under the general appeal listing the wording of the section under which the appeal was filed, "serious and irreversible harm to plant life, animal life and the natural environment". It does note in paragraph 8 that "Ostrander Point has also been designated a Candidate Area of Natural and Scientific Interest by the MNR". The Candidate ANSI status is related to the presence of alvar on the Site, as discussed below.

[543] The Tribunal notes that the first time the Approval Holder raised any objection to the inclusion of alvar as an issue, was at the final written submissions stage on June 13, 2013. The Approval Holder did not object when PECFN provided a witness statement by Dr. Paul Catling on February 20, 2013, in which he stated he will be "providing evidence concerning alvar vegetation at the Ostrander Crown Land Black and he is

qualified to do this as a result of being widely recognized as a North American expert on this kind of vegetation…". The Approval Holder did not raise an objection when PECFN outlined its case in an opening statement on March 4, 2013; it did not raise an objection when Dr. Catling was called to give oral evidence, beginning on March 6, 2013. The Approval Holder began its evidence over one month later, on April 9, 2013, giving it ample time to assure all issues could be canvassed by its witnesses, or to raise the issue with the Tribunal. The Approval Holder was provided significant hearing time to cross-examine Dr. Catling, as he was under cross examination for over two full days. The Approval Holder called as a witness Dr. Larson, an expert in restoration ecology and the ecology of alvars, whose witness statement was filed Februrary 22, 2013. Alvars are clearly a component of the REA that the Approval Holder was aware of, given that one of the conditions prior to construction being able to take place, is that an Alvar Restoration Plan be approved by MNR.

[544] As all parties to this appeal are keenly aware, REA appeals take place under legislated time constraints and all parties have asked for, and been granted, flexibility by the Tribunal in presenting their cases.

[545] The Tribunal finds that there has been nothing improper in the way alvar has been raised and addressed, and there has been no prejudice to the Approval Holder in this regard. The Tribunal will not disregard the portion of PECFN's case dealing with alvar.

2. What is alvar

[546] Alvar is defined in the Federation of Ontario Naturalists' publication, "The Alvars of Ontario", (Brownell and Riley, 2000), at p.5 as follows:

> Alvars are naturally open areas of thin soil over flat limestone or marble rock with trees absent or at least not forming a continuous canopy. It is estimated that at least three-quarters of the total area of alvars in the Great Lakes region are in Ontario. Most of the communities found within alvar landscapes are considered rare in Ontario and throughout their ranges; and over 100 rare, threatened and endangered plant and animal species are largely confined to the alvars. Alvars also contain many disjunct species with southern, western and northern affinities, as well as endemic taxa.
> Alvars are characterized by a mosaic of distinctive plant associations adapted to extreme environmental conditions, including periodic flooding and severe drought, mediated by shallow soil depths, variable water tables and dramatic runoff patterns.

[547] Alvars are globally imperilled.

3. Description of the plant life on the Project Site

[548] The EEMP notes at section 2.2.6, "Alvar Habitat":

> Meadow, shrub and treed alvar communities, together with alvar indicator plant species, were identified within and adjacent to the Project location. The MNR considers all alvar habitat in Ecoregion 6E to be provincially rare, and as a result these communities are all considered significant wildlife habitat in the form of rare habitats.

[549] Dr. Catling was qualified as an expert in alvar vegetation. He has extensive experience as a botanist and research scientist.

[550] Dr. Catling testified that much of the Ostrander Point area is an alvar or an alvar landscape. Several types of alvar communities are globally imperilled. Based on his personal observations and international designation of those types of communities, Dr. Catling opined that at least six globally imperilled and vulnerable vegetation communities exist on the Ostrander Point Site.

[551] There is agreement by all experts that the Site has some disturbance, including evidence of camp fires on the beach, garbage, ATV trails and deer hunting stands. In addition there is some quantity of invasive species, although the degree of degradation on this account was in dispute.

[552] The Ostrander Point Crown Land Block is considered a "Legacy site" by the Department of National Defence. The "South Bay Bombing, Gunnery and Rocket Range" was established by the Royal Canadian Air Force on 322 ha of land adjacent to Ostrander Point in 1952. According to the *Due Diligence Environmental Assessment Screening Report for the Proposed EO Assessment and Clearance in Ostrander Point*, prepared for the Department of National Defence in March 2011 and included with the Approval Holder's materials, "The RCAF used the Site for air-to-ground rocket and gunnery strafing and as a practice bombing range." The Bland Report, prepared for the MNR in 1997, states the Site was used for "tank maneuvers".

[553] The evidence establishes that there was significant disturbance to this Site in the past, although the precise disturbance is not clear. The Tribunal accepts that the alvar landscape has naturalized from an earlier land use that significantly disturbed it.

4. REA Conditions related to alvar

[554] A Class Environmental Assessment ("EA") was conducted for this project under the *Environmental Assessment Act* ("*EAA*") with respect to the MNR's proposed disposition of Crown Land to facilitate the construction of access roads. A notice of completion related to the Class EA was issued on March 2, 2011. In a letter dated December 19, 2012 addressed to the Minister of Natural Resources, the Minister of the Environment rejected a request by members of the public for a direction that the MNR

conduct an individual environmental assessment, but nonetheless listed a number of the conditions on the Project:

> 1. The Ministry of Natural Resources shall ensure that the Alvar Management Plan (Plan) referenced in the Project File is prepared with the input of those members of the public who participated in the Class Environmental Assessment planning process, and any public agencies prior to the commencement of construction of the access roads.
> 2. The Plan shall include:
>
> a. A description of and components that will address the control of aggressive non-native species;
>
> b. The raw data collection or recorded as part of the Plan; and,
>
> c. A description of public/agency participation in the Plan.
>
> …
>
> With this decision having been made, the Ministry of Natural Resources may now proceed with the Project, subject to the conditions I have imposed and any other permits or approvals required. The Ministry of Natural Resources must implement the Project in the manner it was developed and designed, as set out in the Project File and inclusive of all mitigating measures and environmental and other provisions therein.

[555] Arising from the Class EA was the requirement to create an Alvar Restoration and Management Plan ("ARMP"), which is also a component of the EEMP of the REA. The ARMP must be approved by the MNR prior to construction of the Project.

[556] The conditions in the REA (dated December 20, 2012) relevant to alvar state:

> I3. The Company shall implement the post-construction monitoring described in the Environmental Effects Monitoring Plan for Wildlife and Wildlife Habitat and the Environmental Impact Study, described in Condition I1 and I2(1). The plan shall include the following:
> (1) … (2) …. (3)….
> (4) Creation and implementation of Alvar restoration and management plan that includes effectiveness monitoring and reporting.
>
> I17. The Company shall create an Alvar Restoration and Management Plan as described in the Environmental Effects Monitoring Plan and the Environmental Impact Study, including the following:
> (1) The plan shall be approved by the Ministry of Natural Resources prior to the commencement of construction.
> (2) The plan shall include activities that will enhance Alvar vegetation communities on site, by controlling non-native species, and include the restoration of three parcels (4.2ha total) of cultural meadow to Alvar by seeding or transplanting native Alvar species, and will include contingency measures.
> (3) The plan shall include a multi-year monitoring program that measures the success of enhancement and restoration activities.
> (4) The plan shall include communications activities, that at a minimum includes;

(a) Reporting to MNR on the results of the multi-year monitoring.
(b) Publishing of a report on the multi-year monitoring program to the company's website.

[557] At the time of the hearing of this appeal, the ARMP was in draft form and had not yet received input from the interested parties with a right to comment on it.

5. How might the project impact alvar?

[558] While there is agreement that the Project will have some negative impact on the alvar vegetation at the Site, there is disagreement as to the kind and extent of damage. Table 5.2 in the NHA/EIS summarizes potential impacts to Alvar Habitat, and Recommended Mitigation Measures.

Table 5.2 Summary of Potential Impacts and Recommended Mitigation Measures

Potential Impact	Recommended Mitigation Measures	Net Effects
operation		
Significant Wildlife Habitat: Rare Vegetation Communities, Alvar		
Loss of alvar habitat	• Minimization of road widths and lengths. Project infrastructure will directly affect 5.2 ha (1.6%) of the Study Area's alvar habitat	• Small loss of alvar habitat
Introduction and spread of invasive species	• The limits of vegetation clearing will be staked in the field. The Construction Contractor will ensure that no construction disturbance occurs beyond the staked limits and that edges of sensitive areas adjacent to the work areas are not disturbed • All disturbed areas of the construction site should be re-vegetated as soon as conditions allow	• Low net effects
Disturbance and fragmentation of habitat, changes to hydrology	• Access roads will be constructed at existing grade • Creation of an alvar management and monitoring program as part of the Environmental Effects Monitoring Plan	

[559] Three potential impacts to alvar from the wind project are listed: "Loss of alvar habitat"; "Introduction and spread of invasive species"; and "Disturbance and fragmentation of habitat, changes to hydrology". The net effects for the first impact are predicted to be "Small loss of alvar habitat", and for the last two to be "low net effects".

[560] The following is a summary of the disagreements in the appeal.

[561] The Approval Holder's consultants predict the Project will cause a loss of 5.2 ha of open, treed and shrub alvar habitat, due to infrastructure including roads and turbine pads. Approximately 4 ha of cultural meadow is proposed to be restored to alvar habitat by re-seeding, leaving a net loss of 1.2 ha. Dr. Catling predicts that closer to 50 ha will be lost, due to impact of changes to surface water movement, and contaminants being spread by water.

[562] The Approval Holder predicts that proposed mitigation measures will be successful to avoid serious harm to the alvar. It proposes to re-vegetate areas damaged by direct impacts such as crushing and digging, to pre-construction conditions, and to improve the general health of the alvar through management of invasive species. Dr. Catling believes the alvar vegetation will be irreparably lost, and that attempts to manage and restore the remaining alvar will not be effective.

[563] The Tribunal turns to the evidence of the experts in more detail.

Dr. Catling

[564] Dr. Paul Catling made three main points in his testimony: that much of the Site is composed of alvar vegetation, which is globally imperilled; that the Site has not been sufficiently studied to have a full understanding of its importance in relation to other alvars in Ontario, although on the basis of the incomplete studies conducted to date it would be "one of the most significant Sites" in the province; and that serious and irreversible damage will occur to the alvar on this Site.

[565] Dr. Catling testified that, in his opinion, the Project would cause serious and irreversible harm to the alvar plant communities in the following ways:

(i) Direct damage due to crushing of sensitive plants during construction, and removal of sensitive plants for the roads and turbine towers, that will not grow back ("over 50 ha"). This includes additional invasive species spread to the Site through construction vehicles and increased human use of the Site.

(ii) Nutrient changes and pollution (e.g., additional contaminants on the Site brought in from vehicle tires and turbine and construction fluids such as oil)

(iii) Water availability changes (i.e., changes to hydrology of the Site from roads and construction)

[566] He stated that while roads and turbine bases would totally eliminate plant communities and change drainage, other modifications in the area including staging, working, and parking areas would also result in the direct destruction of vegetation by crushing. He estimated that the extent of this kind of direct damage would be 50 ha, within the Crown Land Block area of 324 ha. He noted that this amount is a major concern for two reasons: First, plants moved around an area over time and required the services of pollinators and other insects that could be located for nesting outside of the immediate area of a present occurrence of rare plants. As a result, areas needed to protect plants were often larger than expected. Second, the information available to locate damage without it being serous to plants was insufficient.

[567] He testified that changes in drainage as a result of surface landscape modification would result in changes over a much more extensive area because of the high water table and the fact that surface flow plays an important role in maintaining certain kinds of vegetation. Dr. Catling explained his estimation of over 50 ha of damage to the Site, as based on his years of experience visiting alvars and witnessing the disturbance they have been subject to.

[568] Dr. Catling used "Coefficients of Conservatism" ("COC") to quantify the tolerance of a plant species to disturbance caused by people. All plant species in Ontario have been assigned a COC number by a panel of experts, which represents the biological features of the species. The lower the COC, the less harm can be expected from human disturbance. For example, a plant that is common, aggressive, resilient, broadly adapted, and not susceptible to disturbance would have a COC of zero. Dr. Catling listed a number of plants that he testified occur within the Ostrander Point Crown Land Block, that have a very high COC.

[569] Dr. Catling presented a list of plants that he states are present on the Site. He acknowledged that the field notes that support the list do not include all of the plants on the list. However, Dr. Catling testified that the field notes were not prepared for a scientific study, they were for personal reasons when he saw something of interest and to jog his memory. He relied on his expertise in recognizing and identifying plants, to state he was certain that the plants on his list are present on the Site, including the following plants that score a COC of 9: Philadelphia Witch Grass (8) (Tab 8a p. 9); *verbena simplex* (9); *Carex Craway*.

[570] The "Floristic Quality Index" ("FQI") for an area takes into account all the species present and their coefficients. The FQI is thus the natural quality of an area reflected by its richness of conservative species. Dr. Catling termed the FQI the "value" of the landscape, and its susceptibility to disturbance. Dr. Catling testified that a high FQI indicates restoration is much less likely. An old field would typically have a FQI of 3.89. Drier alvar would have a FQI of 35.43, meaning it is ten times less tolerant of anthropogenic activity. Most of Ostrander Point is an alvar landscape. As a result, Dr. Catling believes that a management plan that includes restoration or re-vegetation of alvar, with the goal returning to "pre-construction conditions", is not likely to be achieved.

[571] Dr. Catling also testified that the number of species present in an area that grow only, or mostly, in alvar habitat, termed "confined species", is an important indicator of the value of the alvar. An example is Crawe's sedge, which is confined to limestone

plains. Dr. Catling created a table of “confined” vs. total alvar vegetation, to evaluate this Site.

[572] As an expert in alvars, then, he has spent many years studying impact of water on alvar vegetation. Dr. Catling believes that a biologist is better placed to assess the extent of damage through changed hydrology to an ecosystem, than an engineer or hydrologist, as it is a biological question. Water plays a significant role in the extent of the damage he predicts.

[573] The soil moisture regime is extremely important to alvars. In Dr. Catling’s view, vehicle ruts alter the soil moisture. He quotes the “International Alvar Initiative” (Reschke et al, 1999) that “management plans for alvar Sites should prevent all vehicles from driving over alvars…”, for this reason.

[574] Dr. Catling noted that, due to the shallow drainage and flat landscape, contaminants of surface and ground water from fill, oil and lubricants from vehicles and transformers can be carried over large areas.

[575] Although not a hydrologist himself, Dr. Catling has worked with many hydrologists and testified that, in any event, a hydrologist is not the best placed to comment on impact of water changes on biology; a biologist should do that. Alvars depend on soil moisture, which includes a complex of variables including water levels, flow rates, and water chemistry.

[576] Dr. Catling acknowledged that the draft ARMP cites an intention to maintain roads “at grade”. However, his concerns extend to surface runoff as well as groundwater and also the spread of pollutants, such as lubricants used on the Site.

[577] With respect to the roads planned east-west across the Site, he says that they will interfere with north/south drainage. Dr. Catling notes that there is no hydrological study. He believes that both north/south and east/west drainage is important to the alvar vegetation on the Site.

[578] Dr. Catling commented on the Draft ARMP. The stated aim of the plan, as noted under section 1.2 (Introduction), is “restoring areas of alvar habitat that have been previously degraded due to the presence of invasive species, and enhancing additional areas of alvar habitat within the Crown Land Block”.

[579] In particular, Dr. Catling categorically and emphatically testified that the idea of creating new alvar, and restoration to “pre-construction conditions”, are impossible.

[580] Dr. Catling testified that removing invasive species and seeding or planting native plants is “remediation” of an alvar Site. He termed these remediation measures

"gardening". These are the elements of remediation included in the draft ARMP. However, in his view these gardening attempts at remediation are temporary (i.e., they are only effective while they are being undertaken). While they are "better than nothing" and may assist in staving off invasive species from an existing alvar, there has never been a single instance of a recovery of an alvar to a self-sustaining ecosystem. Alvars are, he testified, a very complex ecosystem, involving hydrology, climate, animal life and plant life. They simply cannot be created or re-created. Dr. Catling's conclusion is that the only way to maintain this important alvar, is to prevent damage in the first place.

[581] With respect to the degree of disturbance to the Site, and the amount of invasive species, Dr.Catling testified that some alvar Sites are more prone to invasive species than others. He said he wouldn't describe the invasive species here as "a great deal", and that it "may be negligible". In reply to the description in the Stantec report (May 2011, page 47), Dr. Catling agreed "there is clearly a degree of disturbance that has continued".

[582] Dr. Catling concluded with the comment that "Most of Ostrander Point is an alvar landscape and, very importantly, it is globally imperilled. It is a very, very important place." In his opinion, serious and irreversible damage will occur, "supported by biological information".

Dr. Larson

[583] Dr. Doug Larson was qualified as an expert terrestrial ecologist, with expertise in restoration ecology, ecology of alvars and experimental design.

[584] Dr. Larson is a Professor Emeritus in the Department of Integrative Biology at Guelph University. He holds a Ph.D. from McMaster University in plant ecology.

[585] Dr. Larson described the Site as a heavily disturbed landscape with large numbers of disturbance tolerant trees, shrubs and herbaceous plants. Alvar vegetation is well established within this matrix. His view is that it is regenerating after a massive disturbance.

[586] Dr. Larson agrees with Dr. Catling's prediction that all vegetation communities under the turbine pads will be destroyed completely and that areas of ground around each construction Site will have vegetation damaged to some degree. Dr. Larson does not know how Dr. Catling was able to make his estimate that 50 hectares will be the total area so damaged. Stantec suggests about 5.2 ha of alvar habitat will be directly affected by construction and associated activities.

[587] Dr. Larson agrees with Dr. Catling's comments dealing with restoration ecology, as it is not known what the impacts of the turbines and their construction will be on the hydrology of the Site.

[588] However, his view is that such uncertainty about the future success of ecological restoration is widely accepted in science making it difficult or impossible to state with certainty that certain irreversible disturbances will impact the vegetation.

[589] While it is not known whether complete alvar communities can be restored at Ostrander Point, Dr. Larson is confident that we in Ontario have sufficient scientific knowledge and trained personnel to come up with an ARMP that will prevent serious and irreversible harm to the alvar plant community at the Site.

[590] Dr. Larson has advised Stantec of two important areas that remain unresolved: Selection of the restoration target (one of three options available (a) pre-settlement conditions, (b) current alvar structure, (c) improved alvar structure), and selection of the best quantitative vegetation monitoring methods.

[591] Dr. Larson concludes that, if implemented, the draft management plan will provide conditions that permit Site restoration, but success depends entirely on the restoration target selected. He says that if the pre-settlement target is selected, the likelihood of restoration success is low because we lack clear understanding of pre-settlement conditions. Restoration is likely to be completely successful if the current conditions are the target. If the target is an improved alvar, restoration success will be no less than what is currently on the Site. In Dr. Larson's view, regardless of the target selected, if the Site is restored, there will not have been serious and irreversible harm to the alvar plan community created by the construction of the wind farm.

Steve Brown

[592] The Approval Holder called a hydrological engineer, Steve Brown, to present the Water Report. Mr. Brown was qualified as an expert in surface water resource engineering. Mr. Brown confirmed that the water report was focused on water courses and fish habitat as defined by the *Fisheries Act*. It did not deal with surface water or alvar.

Andrew Taylor

[593] Andrew Taylor, a terrestrial biologist with Stantec, did the vascular plant survey for the Natural Heritage Assessment. Mr. Taylor was not qualified by the Tribunal as an expert. He was found to be a terrestrial biologist with experience in the assessment and mitigation of environmental impacts at wind farms with respect to vegetation and wildlife.

Analysis and Findings

a. Findings on expertise

[594] Counsel for the Approval Holder raised the issue during reply evidence, that Dr. Catling was qualified as an expert in alvar vegetation but not alvar "ecosystems". The Approval Holder also objected to Dr. Catling giving opinion evidence on water and on the impact of water on the alvar ecosystem, as this was outside his expertise.

[595] The Tribunal finds that the study of plants, and in this case alvar vegetation, is inextricably linked with an understanding of the importance of water to those plants. For example, biologists delineate significant wetlands; in fact, wetlands are delineated through the identification of wetland vegetation. As such, Dr. Catling is qualified to discuss the importance of the water regime on alvar vegetation. His testimony illustrated how surface water movement impacts alvar vegetation; he did not do a study of the Site, nor had he read one. Dr. Catling stated his observations made on the Site, and opined that water likely moves across the Site parallel to the lake.

[596] Further, the Tribunal finds that alvar is a prime example of the ecosystem approach that the term "plant life", in s.145.2.1, refers to. Alvar has been alternately described as an ecosystem, a community of plants, and a landscape, among others. It is clear that the diversity of plants and their inter-relationship is critical to an alvar, and Dr. Catling, being an expert in alvar, is equally an expert in alvar ecosystems.

[597] Mr. Taylor was not qualified to provide any opinion on the quality or extent of the alvar habitat, or the likely success of mitigation measures. Where Dr. Catling's testimony conflicted with Mr. Taylor's, the Tribunal accepts that of Dr. Catling, who has had decades of experience in finding and classifying alvar plants, to be more reliable. Specifically, the Tribunal accepts Dr. Catling's testimony, supported by Dr. Larson, that the Site is important alvar. The Tribunal accepts his view that the Stantec Report significantly understates the alvar diversity on the Site, which is the very feature that makes this alvar a significant one. Nonetheless, this finding has no practical significance, as the MNR considers all alvars within Eco-Region 6E to be significant wildlife habitat. Significant wildlife habitat requires an EIS and mitigation measures to "minimize impacts to the extent possible".

b. Amount of alvar likely to be lost

[598] The Stantec Report concludes that the amount of alvar that will be directly lost due to infrastructure and construction is 5.2 ha, and if restoration of the cultural meadow is successful, only 1.5 ha. Dr. Catling did not testify that the loss of 1.5 ha of alvar habitat within the Ostrander Point Crown Land Block is serious and irreversible. Rather,

his concern was that some larger amount may be lost or otherwise negatively impacted due to water issues.

[599] The Tribunal finds that Dr. Catling's suggestion that 50 ha of alvar will be impacted by the Project is not supported by evidence. He testified that it is based on personal experience; however, Dr. Catling agreed the figure is an estimate and that no hydrology work has been done on the Site.

[600] This is not to say the Tribunal agrees with the Approval Holder's view, that only 1.5 ha will be impacted. It is very possible that some alvar vegetation will be negatively impacted by hydrological changes to the landscape due to road and infrastructure construction, as Dr. Catling has witnessed elsewhere. However, the level of certainty required in a REA appeal must be higher than "possible" and "concern".

[601] There is no hydrology report to accurately predict the impact of the road building on surface water at the Site, which the Tribunal accepts is critical to the alvar's survival as an important, self-sustaining ecosystem.

[602] The Tribunal has significant concerns about the lack of studies to date on the impact of water on the globally significant alvar on the Project Site. Mr. Brown, a surface water resource engineer with no experience in alvar landscapes, testified that the Water Report was intended to map watercourses and fish communities. It does not cover predicted changes to the surface movement of water over the Site.

[603] Despite the Water Report's purported conclusions that the Project will follow existing roads "wherever possible", it does not provide information on where, or for what percentage of the 5.4 km of roads, it is not possible to do so. It is not clear therefore whether the roads will fragment alvar significant wildlife habitat. Further, there is no information in the Water Report on the "height of land", or any indication that topographic maps have been prepared for the Project Site, to support the Report's conclusions that the roads will be built at the height of land to minimize impact. The Water Report is vague as to how changes to water movement will be measured, referring only to a "visual inspection". Aside from the obvious imprecision in such an inspection, no pre-construction studies have yet been done, with which a visual comparison could be made. The references to the EEMP in section 3.1 of the Water Report specify that they are with respect to aquatic habitats. Any monitoring required will, therefore, be with respect to fish habitat only, and not for impact on alvar vegetation.

[604] Similarly, the REA provides that the roads are not predicted to cause problems because they are built "at grade, wherever possible". There is no indication, however,

as to how much of the roads will be at grade, nor that this will prevent harm due to changes in the movement of surface water.

[605] For all of these reasons, the Tribunal finds that 1.5 ha is an optimistic prediction, and it is likely that more than 1.5 ha (1.6% of the alvar on the Project Site) will be lost due to direct and indirect impacts. How much more, however, is not clear. Since the amount of alvar to be lost is not clear, the Tribunal cannot accept the Director's and Approval Holder's argument that the small amount to be lost mitigates in favour of a finding that the harm is not serious.

[606] There is considerable evidence supporting a finding that loss to this alvar is serious. The very need for an alvar management plan is an indication that the MNR finds loss of alvar at this Site to be significant harm which requires mitigation.

[607] In addition, the Ostrander Point Crown Land Block is a "candidate ANSI".

> According to the NHA/EIS at section 2.2.2:
> The entire Subject Property is situated within a Candidate Life Science ANSI, the Prince Edward to Ostrander Point ANSI. This Candidate ANSI is shown on Figure 1 (Appendix A) and extends from Prince Edward Point to approximately Petticoat Point, encompassing 2000 ha. As noted by the MNR (2008) "the combination of size, extent of shoreline, known species diversity and special features make this site unique in the Site District".

[608] Dr. Catling included in his materials an excerpt from the report "Life Science Areas of Natural and Scientific Interest in Site District 6E-15" (Snetsinger et al., March 2001), prepared for the MNR, Kingston Area Office ("Snetsinger Report"). The Snetsinger Report studied an area of 2000 ha, "Prince Edward Point to Ostrander Point", and notes that "a large number of rarities have been reported, and further work will likely reveal more." The Report recommends: "Due to some parts of the Site having globally significant status, as well as the Site's importance to migratory birds and its unique botanical characteristics, it is recommended that the Prince Edward Pt. to Ostrander Pt. be considered a provincially significant ANSI." (at p. 122)

[609] Section 3.3.2 of the NHA/EIS notes that Stantec's Site investigations "confirmed the presence of life science values". However, it concludes at s.4.2.2 that "MNR correspondence indicates that the ANSI status is currently unconfirmed and therefore an evaluation of significance is not required and the feature is not subject to development prohibitions or setbacks (MNR, March 8, 2010)".

[610] If this area were a confirmed, rather than a candidate ANSI, it would be afforded further protections under the *EPA*. See, for example, section 5.7 of the Natural Heritage Assessment Guide for Renewable Energy Projects, as follows:

> 5.7 Areas of Natural and Scientific Interest
>
> Under the REA Regulation, Areas of Natural and Scientific Interest (ANSIs) are defined as areas which have values related to protection, scientific study or education. ANSIs are areas of land and water containing natural landscapes or features identified by MNR as life science and/or earth science sites (or both) depending on natural heritage values.
>
> ANSIs are identified systematically based on established science criteria, and contribute to the natural features and landscapes of Ontario. MNR assesses the ANSIs as being provincially, regionally or locally significant. To date, more than 500 provincially significant ANSIs have been confirmed. When conducting site investigations for ANSIs, applicants must confirm the presence and boundaries of all ANSIs identified through the records review. The boundaries of an ANSI can only be changed by MNR, using the ANSI Identification and Confirmation Procedure.
>
> With the exception of specified provincial plan areas (Table 3), only ANSIs confirmed by MNR as provincially significant are afforded protection through the REA Regulation. **Applicants are not required to identify additional ANSIs through site investigation.** (emphasis added)

[611] Similarly, if this alvar were located in the “Natural Heritage System” of the Greenbelt Plan, it would be afforded further protections under the Regulation in that there is a prohibition against development in the feature or within 120 m of the feature, unless an EIS is done.

[612] While Ostrander Point Crown Land Block is a candidate ANSI, there was no evidence before the Tribunal that it is designated as a protected landform. It has simply not yet been designated as such by the MNR.

[613] The evidence before the Tribunal raises the question of whether a wind project development will prevent a candidate ANSI from being considered as an ANSI in the future. The Tribunal has considered this possible future harm to the Site, due to removal of this opportunity for long-term protection. However, these concerns have not been proven to the standard required under s. 145.2.1 of the *EPA*.

[614] Nonetheless, the direction by the Minister of the Environment to the Minister of Natural Resources that an ARMP must be developed for the Site, has filled the potential gap created here by the ANSI not having been confirmed.

[615] The Tribunal notes that the only place where there is an actual development prohibition is in provincial parks and conservation reserves (Table 4 of the NHA Guide), under s. 16 of the *Provincial Parks and Conservation Reserves Act, 2006*.

Table 3: Additional Development Prohibitions in Provincial Plan Areas

Additional: Applies to project locations proposed in the Oak Ridges Moraine Conservation Plan Area or the Natural Heritage System of the Greenbelt Plan's Protected Countryside Area*		
Natural feature	**Prohibition on development** (construction, installation, or expansion)	**Exception(s) based on EIS**
Sand barrens	In feature or within 120 m setback	Development within feature and setback
Savannahs		
Tallgrass prairies		
Southern wetlands that are not provincially significant		
Areas of natural and scientific interest (life science)		
Alvars (Natural Heritage System of the Greenbelt Plan only)		

*** In the Greenbelt Plan Area, the prohibitions in Table 3 do not apply to project locations proposed entirely within a Protected Countryside settlement area. In the Oak Ridges Moraine Conservation Plan Area, the prohibitions in Table 3 do not apply to project locations proposed entirely within an Oak Ridges Moraine settlement area[6].**

Table 4: Development Prohibitions for Provincial Parks and Conservation Reserves

Protected area	**Prohibition on development** (construction, installation, or expansion)	**Exception(s) based on EIS**
Provincial parks	In protected area or within 120 m setback	Development within setback[7]
Conservation reserves		

Natural features which meet the definition of a water body under the REA Regulation, or overlap with the boundaries of a water body (e.g. a wetland which is also a seepage area), may be subject to additional development prohibitions for some project components. Prohibitions for water bodies are outlined in Sections 39, 40, 44, and 45 of the REA Regulation. The MOE reviews and approves water body reports.

[616] The Tribunal finds that PECFN has established on a balance of probabilities that damage **to alvar vegetation** and to **the alvar ecosystem** in this case will be serious. In making this determination, the Tribunal has given weight to the following factors: the conservation status and the COC of alvar plant life; alvar vegetation is more vulnerable than other types of vegetation that are more broadly adapted and resilient; the protections accorded by the MNR to alvar vegetation in Eco-region 6E; and the size, rarity and diversity in plant life of the Ostrander Point Crown Land Block as an alvar Site.

[617] The test at s. 145.2.1(b) requires a demonstration of serious **and** irreversible harm, however, and the Tribunal now turns to an evaluation of "irreversible".

[618] The Tribunal finds that the Ostrander Point Crown Land Block has recovered to the status of an important, diverse, self-sustaining alvar, following severe disturbance in the past. This past recovery mitigates against a finding that the harm to plant life in this case will be irreversible.

[619] The Tribunal listened with interest to the disagreements between Doctors Catling and Larson with respect to the philosophy of restoration. Dr. Catling believes a natural alvar must be left alone, and that attempts to restore it will remove its natural self-sustaining character and replace it with a reasonable facsimile of a natural alvar. The restoration will not in fact "restore", because it is gardening that must continue.

[620] Dr. Larson, on the other hand, believes that natural systems can be improved by restoration efforts undertaken by humans.

[621] Dr. Larson was clear in his evidence, that the Site is undergoing natural regeneration, and that the draft management plan will provide conditions that permit the completely successful restoration of the Site to the current alvar structure. Dr. Catling's conclusion of serious and irreversible harm was predicated on a much greater area of harm (50 ha) and the assumption that the ARMP would not be successful.

[622] The Tribunal finds the evidence of regeneration of the Site from past disturbance to its current status as an important alvar, to be compelling. It is a demonstration that the alvar vegetation currently found on the Site, was not irreversibly damaged in the past. The final line of the Snetsinger Report also supports this conclusion, as it states "If the landowners should decide to abandon farm operations on these lands, it is expected that they will quickly take on the ecological character of the surrounding lands." (at p. 122)

[623] The Tribunal finds that Dr. Catling's concerns regarding harm to plant life that is more widespread due to changes in hydrological conditions on the Project Site, has not been proven on a balance of probabilities. The Tribunal notes that these concerns strike closer to the heart of "irreversible" harm to plant life; permanent changes to surface water flow would be more likely to have a permanent impact on the vegetation on a Site.

[624] Dr. Catling's concerns regarding contaminants leaking onto the Site from vehicles and turbine components did not take into consideration the conditions of the REA related to spills and truck washing. Similarly, his concerns regarding the introduction of invasive species did not take into consideration the requirement to provide for truck washing, and the minimum measures listed in the REA, that are to be included in the ARMP to control invasive species. The Tribunal agrees that any finding of serious and irreversible harm must be made after taking into consideration all mitigation measures. As a result, the appellant has not established serious and irreversible harm to the alvar vegetation through contamination or introduction of invasive species.

Conclusion on Alvar

[625] The Tribunal finds that, in this case, the removal of alvar plant life due to construction of the turbine bases and the access roads, taking into account the mitigation measures required under the ARMP, is not "serious and irreversible harm" to the alvar vegetation or the alvar ecosystem at Ostrander Point. As Ostrander Point itself has demonstrated, it has naturalized into an alvar landscape after former uses were abandoned. If one considers the permanence of the 1.5ha loss, the wind project has a projected life of 25 years plus a possible 15 year extension, totalling 40 years. The evidence is that the alvar vegetation will likely recolonize the area of the project components, once the infrastructure is removed.

[626] The Tribunal therefore finds that PECFN has not shown that engaging in the Project in accordance with the REA, (i.e., including the minimum mitigation measures outlined in s. I17 of the REA that must be included in a future ARMP), will cause serious and irreversible harm to alvar plants or the alvar ecosystem at the Ostrander Point Crown Land Block.

Summary of Findings

Issue No. 1: Whether engaging in the Project in accordance with the REA will cause serious harm to human health.

[627] The evidence in this proceeding did not establish a causal link between wind turbines and either direct or indirect harm to human health at the 550 m set-back distance required under this REA.

[628] The evidence in this hearing did not establish that engaging in the Ostrander Point wind turbine project in accordance with the REA will cause serious harm to human health.

[629] For these reasons the Tribunal finds that the Appellant has not established that engaging in the Project in accordance with the REA will cause serious harm to human health, and dismisses APPEC's appeal.

Issue No. 2: Whether engaging in the Project in accordance with the REA will cause serious and irreversible harm to plant life, animal life or the natural environment.

Sub-issue 1: animal life

[630] The Tribunal finds that mortality due to roads, brought by increased vehicle traffic, poachers and predators, directly in the habitat of Blanding's turtle, a species that is globally endangered and threatened in Ontario, is serious and irreversible harm to

Blanding's turtle at Ostrander Point Crown Land Block that will not be effectively mitigated by the conditions in the REA.

[631] The Tribunal finds that the appellant has not established that engaging in the Project in accordance with the REA will cause serious and irreversible harm to birds or their habitat.

[632] The Tribunal concludes that PECFN has not established that engaging in the Project in accordance with the REA will cause serious and irreversible harm to bats.

[633] The Tribunal finds that PECFN has not established that engaging in the Project in accordance with the REA will cause serious and irreversible harm to Monarch butterflies.

Sub-issue 2: plant life

[634] The Tribunal finds that PECFN has not shown that engaging in the Project in accordance with the REA, (i.e., including the minimum mitigation measures outlined in s. I17 of the REA that must be included in a future ARMP), will cause serious and irreversible harm to alvar plants or the alvar ecosystem at the Ostrander Point Crown Land Block.

Issue 3: If the answer to either Issue 1 or 2 is "yes", whether the Tribunal should revoke the decision of the Director, by order direct the Director to take some action, or alter the decision of the Director.

[635] As noted above, the Tribunal finds that mortality due to roads, brought by increased vehicle traffic, poachers and predators, directly in the habitat of Blanding's turtle, a species that is globally endangered and threatened in Ontario, is serious and irreversible harm to Blanding's turtle at Ostrander Point Crown Land Block that will not be effectively mitigated by the conditions in the REA.

[636] Under s. 145.2.1(4) of the *EPA,* the Tribunal may do one of the following where the test has been satisfied:

(a) revoke the decision of the Director;

(b) by order direct the Director to take such action as the Tribunal considers the Director should take in accordance with the *EPA* and the regulations; or

(c) alter the decision of the Director, and, for that purpose, the Tribunal may substitute its opinion for that of the Director.

[637] The Tribunal received no submissions on an appropriate remedy under s.145.2.1(4) of the *EPA.* In particular, the Tribunal received no submissions on how the

Project could proceed in a way that avoids the road mortality issue identified by the Tribunal.

[638] The Project Description report states that the "Ostrander Point Crown Land Block has also been designated a Resource Management Area by the MNR and it has been determined that the Project is considered to be compatible with existing land uses. … existing recreational land uses … will remain on the unleased land".

[639] The Non-Forestry Road-Use Management Strategy Declaration of Responsibility, attached to the Work Permit issued by the MNR for the access roads, specifically notes that "the proposed multipurpose access road will allow greater access to the Crown land resource for hunting and trapping and other passive recreational activities". There is a chart labelled "Management Strategies", which notes under "Access Control" that "Access control can only occur at each turbine location under Crown Lease and at the Transformer Station. Other than the turbine location and the transformer station, the remainder of the access roads are open to public travel as per the MNR's Free Use Policy (PL.3.03.01)".

[640] Whether or not Crown land should be closed to public access in order to allow a wind development to proceed is a value judgment that is not within the purview of the Tribunal to make. At its essence, it is a decision whether the Ostander Point Crown Land Block will be used for wind energy generation, rather than current Crown land uses which do not involve road development. The Tribunal is also left with concerns regarding the compatibility of hunting in an area where there is no setback to the base of the turbine towers. In the Tribunal's view, the current REA indicates the MNR is trying to have it both ways; to allow an increased level of public use, while at the same time allowing a wind energy project. Although such a result would be a "win-win", in the Tribunal's view it will cause serious and irreversible harm to Blanding's turtle at the Project Site and in the surrounding habitat areas.

[641] The Tribunal is therefore not in a position to alter the decision of the Director, or to substitute its opinion for that of the Director. As a result, the Tribunal revokes the decision of the Director.

Other Matters – June 27, 2013 Motion for new evidence

[642] On June 27, 2013, PECFN brought a motion to admit four documents as new evidence under Rule 234 of the Tribunal's Rules. The motion was heard in writing. The Director and the Approval Holder filed a written response on June 28, 2013 and July 2, 2013 respectively. PECFN filed reply submissions on July 2, 2013.

[643] Having considered the submissions of the parties, the Tribunal dismisses the Motion. Reasons for the Tribunal's dismissal of the Motion will follow.

DECISION

[644] The appeal of APPEC is dismissed under s.145.2.1 (5) of the *EPA*.

[645] The appeal of PECFN is allowed under s. 145.2.1(5) of the *EPA*.

[646] The Tribunal revokes the decision of the Director.

APPEC Appeal Dismissed
PECFN Appeal Allowed

"Robert V. Wright"
Robert V. Wright, Panel Chair

"Heather I. Gibbs"
Heather I. Gibbs, Vice-Chair

Appendices

Appendix A – Relevant Legislation and Rules

Appendix B – Map of Ostrander Crown Land Block and proposed location of wind turbines, transformer substation and wetland natural features

Appendix C – Map of Prince Edward County South Shore and IBA

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Appendix I – Excerpt of Transcript with oral ruling on expertise of Ian Dubin, April 25, 2013.

Appendix J – Excerpt of Transcript with oral ruling on PECFN's request to call Dr. Beaudry, March 18, 2013

Appendix A – Relevant Legislation and Rules

Environmental Protection Act

3.(1) The purpose of this Act is to provide for the protection and conservation of the natural environment.

Grounds for hearing

142.1 (3) A person may require a hearing under subsection (2) only on the grounds that engaging in the renewable energy project in accordance with the renewable energy approval will cause,

(a) serious harm to human health; or

(b) serious and irreversible harm to plant life, animal life or the natural environment.

What Tribunal must consider

145.2.1 (2) The Tribunal shall review the decision of the Director and shall consider only whether engaging in the renewable energy project in accordance with the renewable energy approval will cause,

(a) serious harm to human health; or

(b) serious and irreversible harm to plant life, animal life or the natural environment.

Onus of proof

(3) The person who required the hearing has the onus of proving that engaging in the renewable energy project in accordance with the renewable energy approval will cause harm referred to in clause (2) (a) or (b).

Powers of Tribunal

(4) If the Tribunal determines that engaging in the renewable energy project in accordance with the renewable energy approval will cause harm referred to in clause (2) (a) or (b), the Tribunal may,

(a) revoke the decision of the Director;

(b) by order direct the Director to take such action as the Tribunal considers the Director should take in accordance with this Act and the regulations; or

(c) alter the decision of the Director, and, for that purpose, the Tribunal may substitute its opinion for that of the Director.

Same

(5) The Tribunal shall confirm the decision of the Director if the Tribunal determines that engaging in the renewable energy project in accordance with the renewable energy approval will not cause harm described in clause (2) (a) or (b).

Endangered Species Act

2. (1) "habitat" means,

(a) with respect to a species of animal, plant or other organism for which a regulation made under clause 55 (1) (a) is in force, the area prescribed by that regulation as the habitat of the species, or

(b) with respect to any other species of animal, plant or other organism, an area on which the species depends, directly or indirectly, to carry on its life processes, including life processes such as reproduction, rearing, hibernation, migration or feeding,

and includes places in the area described in clause (a) or (b), whichever is applicable, that are used by members of the species as dens, nests, hibernacula or other residences; ("habitat")

(2) For greater certainty, clause (b) of the definition of "habitat" in subsection (1) does not include an area where the species formerly occurred or has the potential to be reintroduced unless existing members of the species depend on that area to carry on their life processes.

Permits

17.(1) The Minister may issue a permit to a person that, with respect to a species specified in the permit that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species, authorizes the person to engage in an activity specified in the permit that would otherwise be prohibited by section 9 or 10.

Limitation

(2) The Minister may issue a permit under this section only if,

(c) the Minister is of the opinion that the main purpose of the activity authorized by the permit is not to assist in the protection or recovery of the species specified in the permit, but,

(i) the Minister is of the opinion that an overall benefit to the species will be achieved within a reasonable time through requirements imposed by conditions of the permit,

(ii) the Minister is of the opinion that reasonable alternatives have been considered, including alternatives that would not adversely affect the species, and the best alternative has been adopted, and

(iii) the Minister is of the opinion that reasonable steps to minimize adverse effects on individual members of the species are required by conditions of the permit

Evidence Act

35. (1) In this section,

"business" includes every kind of business, profession, occupation, calling, operation or activity, whether carried on for profit or otherwise; ("entreprise")

"record" includes any information that is recorded or stored by means of any device. ("document")

Where business records admissible

(2) Any writing or record made of any act, transaction, occurrence or event is admissible as evidence of such act, transaction, occurrence or event if made in the usual and ordinary course of any business and if it was in the usual and ordinary course of such business to make such writing or record at the time of such act, transaction, occurrence or event or within a reasonable time thereafter.

Notice and production

(3) Subsection (2) does not apply unless the party tendering the writing or record has given at least seven days notice of the party's intention to all other parties in the action, and any party to the action is entitled to obtain from the person who has possession thereof production for inspection of the writing or record within five days after giving notice to produce the same.

Surrounding circumstances

(4) The circumstances of the making of such a writing or record, including lack of personal knowledge by the maker, may be shown to affect its weight, but such circumstances do not affect its admissibility.

Previous rules as to admissibility and privileged documents not affected

(5) Nothing in this section affects the admissibility of any evidence that would be admissible apart from this section or makes admissible any writing or record that is privileged.

52.(1) In this section,

"practitioner" means,

(a) a member of a College as defined in subsection 1 (1) of the *Regulated Health Professions Act, 1991*,

(b) a drugless practitioner registered under the *Drugless Practitioners Act*,

(c) a person licensed or registered to practise in another part of Canada under an Act that is similar to an Act referred to in clause (a) or (b).

Medical reports

(2) A report obtained by or prepared for a party to an action and signed by a practitioner and any other report of the practitioner that relates to the action are, with leave of the court and after at least ten days notice has been given to all other parties, admissible in evidence in the action.

Entitlement

(3) Unless otherwise ordered by the court, a party to an action is entitled, at the time that notice is given under subsection (2), to a copy of the report together with any other report of the practitioner that relates to the action.

Report required

(4) Except by leave of the judge presiding at the trial, a practitioner who signs a report with respect to a party shall not give evidence at the trial unless the report is given to all other parties in accordance with subsection (2).

If practitioner called unnecessarily

(5) If a practitioner is required to give evidence in person in an action and the court is of the opinion that the evidence could have been produced as effectively by way of a report, the court may order the party that required the attendance of the practitioner to pay as costs therefor such sum as the court considers appropriate.

Statutory Power Procedures Act

15.(1) Subject to subsections (2) and (3), a tribunal may admit as evidence at a hearing, whether or not given or proven under oath or affirmation or admissible as evidence in a court,

(a) any oral testimony; and

(b) any document or other thing,

relevant to the subject-matter of the proceeding and may act on such evidence, but the tribunal may exclude anything unduly repetitious.

What is inadmissible in evidence at a hearing

(2) Nothing is admissible in evidence at a hearing,

(a) that would be inadmissible in a court by reason of any privilege under the law of evidence; or

(b) that is inadmissible by the statute under which the proceeding arises or any other statute.

Rules of Practice of the Environmental Review Tribunal

29. A Notice of Appeal respecting a renewable energy approval filed under section 142.1 of the *Environmental Protection Act* shall include:

(a) the Appellant's name, address, telephone number, facsimile number and email address and the name and contact information of anyone representing the Appellant;
(b) a copy of the renewable energy approval being appealed;
(c) identification of the portions of the renewable energy approval that the Appellant is appealing;
(d) a description of how engaging in the renewable energy project in accordance with the renewable energy approval will cause,
  (i) serious harm to human health, or
  (ii) serious and irreversible harm to plant life, animal life or the natural environment;
(e) a statement of the issues and material facts relevant to the subject matter of the appeal that the Appellant intends to present at the main Hearing;
(f) a description of the relief requested; and
(g) an indication of whether the Appellant will seek a stay of the renewable energy approval.

A Notice of Appeal respecting a renewable energy approval is accepted by the Tribunal when it meets all the requirements for filing an appeal under the *Environmental Protection Act*.

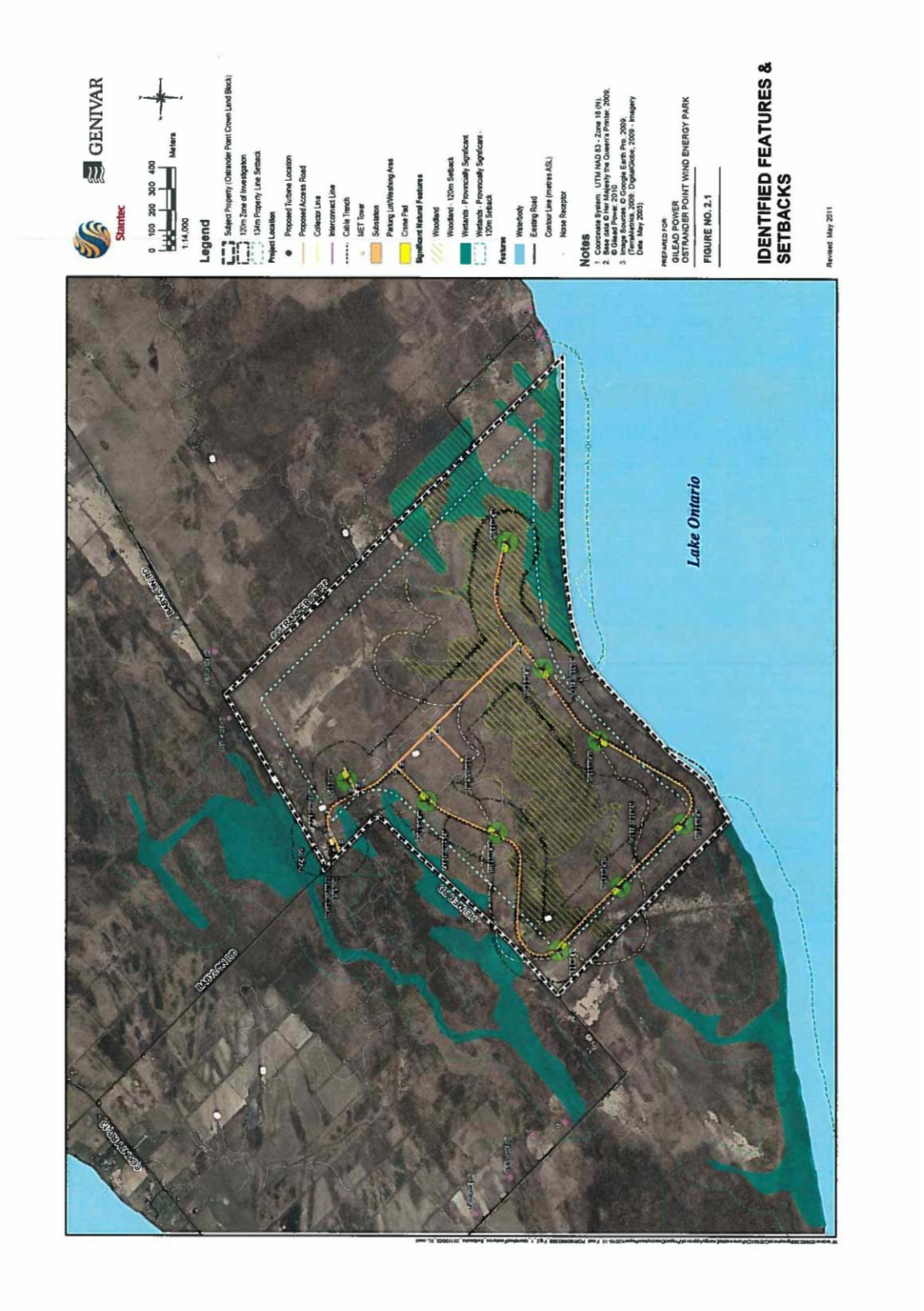
183. Subject to evidence being inadmissible under a statute or because of privilege, the Tribunal may admit as evidence in a hearing, whether or not given under oath or affirmation or admissible in a court, any oral testimony and any document or other thing relevant to the

subject-matter of the proceeding and may act on it, but the Tribunal may exclude anything unduly repetitious.

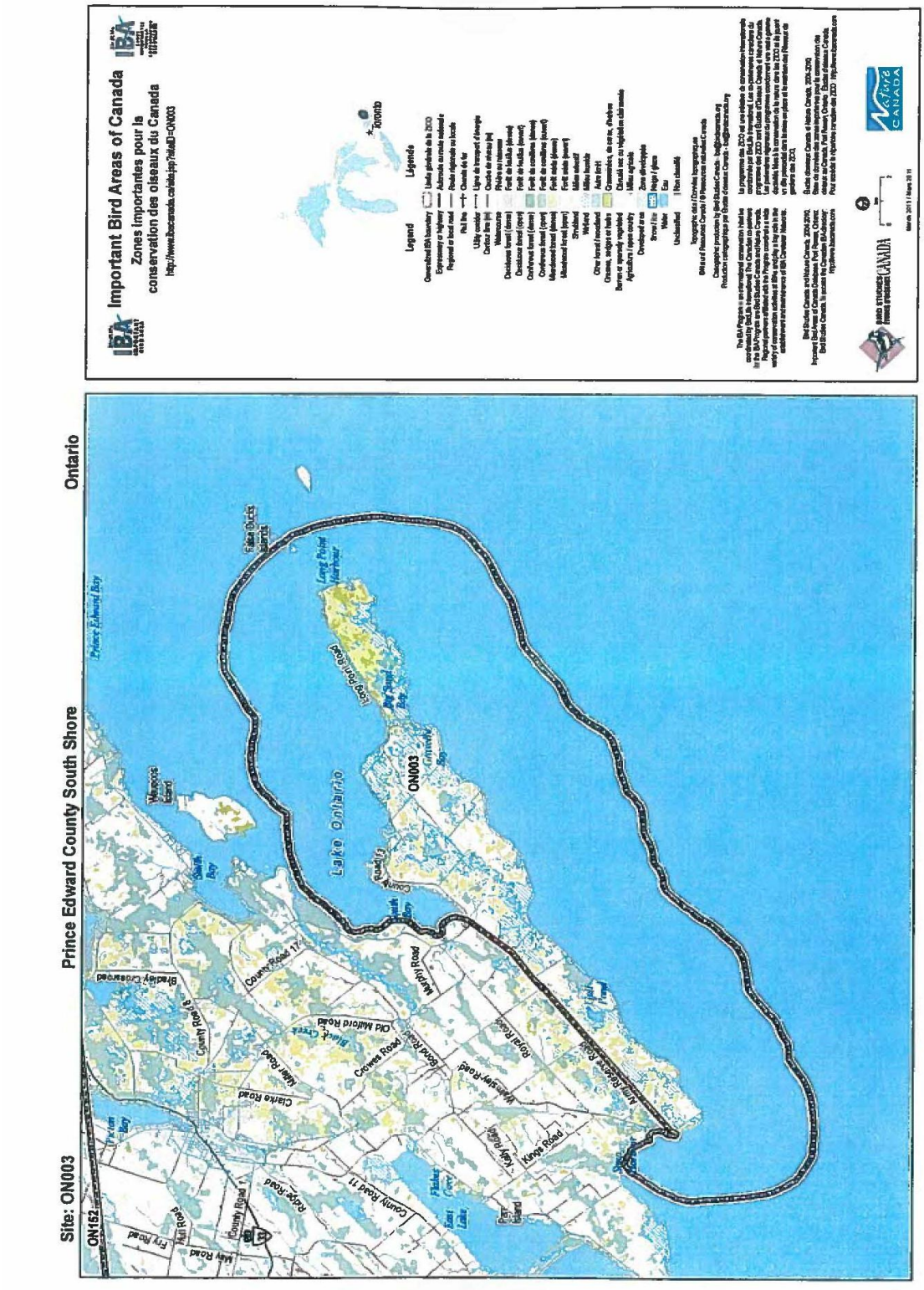
233. Once the Hearing has ended but before the decision is rendered, a Party may make a motion to admit new evidence.

234. The Tribunal shall not admit new evidence unless it decides that the evidence is material to the issues, the evidence is credible and could affect the result of the Hearing, and either the evidence was not in existence at the time of the Hearing or, for reasons beyond the Party's control, the evidence was not obtainable at the time of the Hearing.

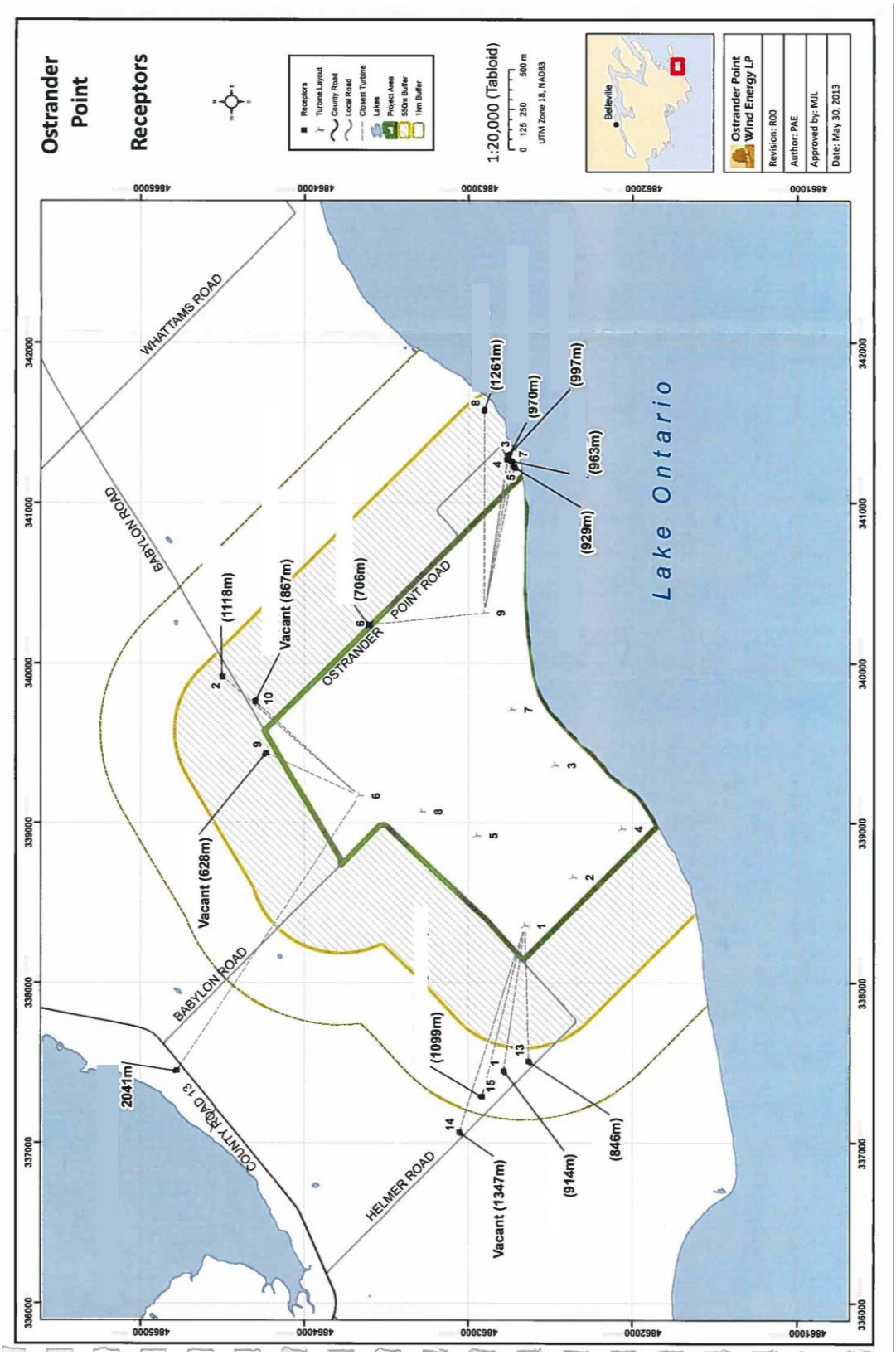
Appendix B – Map of Ostrander Crown Land Block and proposed location of wind turbines, transformer substation and wetland natural features



Appendix C – Map of Prince Edward County South Shore and IBA



Appendix D – Map of Receptors and set-back distances for the Ostrander Crown Land Block wind project



Appendix E – Sample Witness Information Form – Post Turbine

1. Name(s) and age(s) of witness(es):
2. Address of residence you live in (or have lived in) within 2 kms of a Wind Project:
3. Current Address (if different from above):
4. Name(s), age(s) and relationship(s) to other persons who live(d) in household:
5. Name of the Industrial Wind Turbine (IWT) Project and Operator (if known):
6. Name of Environmental Consultant for IWT Project (if known):
7. Make, Model, Size and Number of IWTs (as best you know):
8. Project Layout and Distance of Turbines from your Location:
9. Do you know the maximum dbA level:
   (a) predicted at your house
   (b) allowed for the Project
10. Date of Start of Operation:
11. Please describe your residence's construction materials exterior/interior/windows etc.

For questions 12 to 16 note "health" includes physical health, mental health and well being.

12. What, if any, pre-existing health conditions did any witness(es) have prior to the IWT Project?
13. What, if any, pre-existing health conditions did any other people living in your household have prior to the IWT Project?
14. What, if any, health effects has the IWT Project had on the witness(es)?
15. What, if any, health effects has the IWT Project had on other people in your household?
16. What, if anything, have you done in response to any health effects from the IWT Project?

If not discussed in your answer to Question 16, as a result of the IWT Project:

17. Have you contacted the Ministry of Environment and/or MOE's Spills Line?
18. If so, what happened?

19. Have you contacted Doctor(s), Hospital(s) or other Heath Care Professional(s)?
20. If so, what happened?
21. Have you been or are you involved in any legal action(s)?
22. If so, what happened
23. Have you sold your home or has it been purchased as a result of the IWT Project?
24. What, if any, restrictions are there on what you can discuss?
25. Please list any documents you would like to refer to when giving evidence:

Appendix F – Excerpt of Transcript with oral Tribunal ruling on relevance of medical records, March 6, 2013

RULING:

The following is a determination of the motions by the Director and the Approval Holder for the disclosure of medical records by the Appellant, Alliance to Protect Prince Edward County, APPEC. Reasons will be provided at a later date.

APPEC shall forthwith request its pre-turbine witnesses who claim that they will suffer serious health effects due to living in close proximity to the proposed wind turbines to obtain medical records relevant to such claims for the period commencing five years prior to the date of the filing of APPEC's appeal with the Tribunal to the present and to provide them to APPEC forthwith. APPEC shall forthwith disclose such medical records to the Director and the Approval Holder on a date to be agreed upon by the parties or determined by the Tribunal. I'm going to suggest by Thursday, March 7th, which is when we have the session in Toronto.

The parties are to attempt to agree on a date for that disclosure, failing which the Tribunal will do so.

APPEC shall, forthwith, request that its post-turbine witnesses, subject to the election referred to below, who claim that they have suffered serious health effects due to living in proximity to wind turbines, obtain medical records relevant to such claims for the period commencing five years prior to the date the witness began residing near the wind turbine project in question to the present and to provide them to APPEC forthwith.

APPEC may elect to only request such medical records from no less than one-half of its post-turbine witnesses. APPEC shall forthwith disclose such medical records to the Director and the Approval Holder.

Then there is the same requirement as to the parties agreeing upon a date or the Tribunal will set one.

The order regarding disclosure of medical records is not a determination by the Tribunal of the ultimate relevancy of the medical records so disclosed at the hearing. Nor does it foreclose a possibility that further disclosure of medical records by APPEC and its post-turbine witnesses may be requested by the Director or the Approval Holder or required by the Tribunal in the course of the evidence of the post-turbine witnesses at the hearing.

The parties are to attempt to resolve any issues of confidentiality regarding disclosure of the medical records, failing which they may seek direction from the Tribunal.

Appendix G – Excerpt of Transcript with oral Tribunal ruling on use to be made of medical records, May 21, 2013

For those on the phone, at the end of last week there was an issue regarding what medical records and what use to make of them. So, this is the panel's decision on that.

RULING BY THE TRIBUNAL

THE CHAIR: The parties asked for directions regarding the opinions, including diagnoses contained in medical records put into evidence by the APPEC witnesses.

The Approval Holder, supported by the Director, submits that the medical records are admissible as business records under Section 35 of the Ontario Evidence Act, but not for the truth of their contents regarding opinions, including diagnoses under Section 52 of that act.

The Approval Holder and the Director argue that they would be deprived of the right to cross-examine on those opinions and diagnoses. The Appellant APPEC submits that the medical records are admissible for the truth of their contents.

The Tribunal finds that there is no statutory bar to admitting the medical records under Section 15(2)(b) of the Statutory Powers of Procedure Act, and that the Tribunal Rule 183 also applies.

The medical records are admissible as evidence, but not as expert opinion evidence. That evidence has not been tested. Therefore, if the parties wish to rely upon opinions, including diagnosis, then they should, at this stage, in this REA appeal proceeding, seek leave to call the appropriate witness in that regard.

Appendix H – Excerpt of Transcript with oral Tribunal ruling on admissibility of Dr. McMurtry's evidence as an expert, May 28, 2013

THE CHAIR: The Appellant seeks to qualify Dr. Robert McMurtry as a "physician and surgeon with experience in delivery of health care, health care policy and health policy." The witness was so qualified in *Erickson*, the first Renewable Energy Approval appeal hearing by the Environmental Review Tribunal.

The Approval Holder and the Director do not take issue with Dr. McMurtry's expertise as stated, but oppose the qualification on the basis of relevance and alleged bias. Dr. McMurtry is an orthopaedic surgeon by training and practice, but he also has a strong background in health policy matters, including involvement in the Romanow Commission and the preparation of a Canadian Index of Well-Being. He has done a lot of self-study regarding the impacts of industrial wind turbines on human health and has discussed these matters with in excess of 40 persons who claim such impacts. He has also reported on a total of 53 such cases.

He has written an article entitled "Toward a Case Definition of Adverse Health Effects In the Environs of Industrial Wind Turbines: Facilitating a Clinical Diagnosis", which has been published in a peer-reviewed journal and referenced in some others.

It is Dr. McMurtry's evidence that he is not anti-industrial wind turbines, per se, and that his focus is to protect human health and to promote prevention of detrimental effects of industrial wind turbines in relation to their proximity to humans.

Dr. McMurtry lives in Prince Edward County, approximately 2,800 metres away from the site of the proposed wind project. In the above referenced article he recommends a safety zone of 5 kilometres. He has been a Director of APPEC and made financial contributions, is an Appellant in this matter, has been a plaintiff in a lawsuit alleging reduced property values due to the proximity of another wind project, White Pines Development, and spoken publicly against wind projects.

Dr. McMurtry says that he resigned his position with APPEC and has withdrawn from the lawsuit, partly to enable to be an independent witness in proceedings such as this.

The Appellants submit that Dr. McMurtry has discussed the alleged detrimental impacts of industrial wind turbines with more persons than any other medical practitioner in Canada and that he has the only article relating to the subject of a clinical diagnosis that has appeared in a peer-reviewed journal and been referred to in other peer-reviewed journals.

The Approval Holder and the Director do not contest that Dr. McMurtry has the qualifications referred to, but they say that such qualification is not relevant to the issues to be determined in this hearing, namely whether engaging in the renewable energy project in accordance with the Renewable Energy Approval will cause serious harm to human health being the issue relevant to this Appellant's case.

The Approval Holder and the Director ask that the Tribunal exercise its gatekeeper function and not hear Dr. McMurtry's evidence at all, as the issue before the Tribunal is not one of policy but as already stated.

The Director also argues that this case is different than *Erickson* where APPEC was not an Appellant and that the Tribunal in that case gave substantial leeway but did not open the door to similar evidence in all future cases.

The Appellant argues that Dr. McMurtry will be the only witness on human health from a broad perspective and that the Appellant will be attempting to link health policy, including case definitions, with health care delivery to individuals.

In *Erickson*, at paragraph 715 the Tribunal stated:

> Given the novelty of the issues being raised in this proceeding and the relatively small number of individuals who have been involved in the recent research on health effects from turbines, the Tribunal found that it was appropriate to hear from these witnesses (especially given two of the most contested witnesses co-authored the Nissenbaum Study that was at the heart of the present appeals). Nevertheless, the Tribunal has kept in mind the relative objectivity of the various witnesses in reaching its conclusions on the evidence.

And again at paragraph 723 in *Erickson* the Tribunal stated:

> In other cases, some aspects of the testimony appeared to be less than objective and strayed somewhat towards advocacy. The Tribunal adds that such issues arose with respect to witnesses from all Parties. In many ways it was probably unrealistic to expect that a stable of completely impartial witnesses would be called upon to testify on such novel questions as those that were raised in this proceeding. At present, there are studies and reports emanating from various sources that are actively involved in the debate about wind turbines. As compared to other fields of expertise, there are comparatively few sources of information. This is to be expected in a nascent situation such as this, especially where there is a tight timeline associated with the Hearing.

The recent Goudge Report and case law serve to emphasize the gatekeeper function of the Tribunal.

In this case, the Tribunal finds that Dr. McMurtry has the expert qualifications as requested. The Tribunal cannot say at this point that his evidence would likely have no relevance to the issue to be decided. On the matter of bias, while the Tribunal can

envisage situations where the likelihood of bias would outweigh the value of receiving evidence of a witness, this is not such a case. Dr. McMurtry's track record of public service alone overrides any such concern in this case.

In referring to the Practice Directions of the Environmental Review Tribunal, and in particular 9(e), it states:

> The witness must never assume the role of an advocate for a party. Argument and advocacy should be left to counsel or agents presenting the party's case. This does not preclude the vigorous advancement of strongly held scientific or other professional opinions or prevent a duly qualified witness who is also a party from advancing technical and opinion evidence.

As has consistently been the finding in cases cited by counsel, the matters raised by the Approval Holder and the Director will be considered in the weight to be given to the evidence of the witness.

Just to reiterate then, the Tribunal finds Dr. McMurtry to be a physician and surgeon with experience in the delivery of health care, health care policy and health policy.

Appendix I – Excerpt of Transcript with oral ruling on expertise of Ian Dubin, April 25, 2013.

RULING

THE CHAIR: So, for Mr. Dubin and for those present from the public, we had had a teleconference dealing with his request to be qualified as an expert, and also dealing with -- or how to deal with his evidence we were intending to deal with his evidence.

He had earlier been a presenter. So Ian Dubin has presenter status in this proceeding, as set out in the order of the Tribunal dated March 1, 2013. Mr. Dubin also seeks to give his evidence as a qualified expert in the Environmental Impact Assessment process. The Approval Holder and the Director oppose qualifying Mr. Dubin as an expert. The appellants have not stated a position. Mr. Dubin lives in Hong Kong. He has not attended the hearing in person and will not be doing so. The Tribunal arranged for Mr. Dubin to make his request to be qualified as an expert and to provide his oral evidence by teleconference on March 7th, 2013.

While Mr. Dubin participated by teleconference from Hong Kong, the Tribunal and counsel for the parties were gathered in a hearing room at Toronto. Prior to the teleconference, Mr. Dubin had sent information about his qualifications and proposed evidence to the Tribunal and counsel. During the teleconference, the Tribunal heard Mr. Dubin's evidence regarding his expertise. He was cross-examined by Ms. Smith on behalf of the Appellants, Ms. Davis on behalf of the Director and Mr. Gray on behalf of the Approval Holder.

Before the Tribunal could hear submissions of Mr. Dubin, and the parties on the question of his expertise, the teleconference was cut short, possibly due to technical difficulties with the connection. The Tribunal subsequently requested written submissions from Mr. Dubin and the parties on the question of his expertise. Mr. Dubin, the Director and the Approval Holder completed their written submissions before the end of March 2013. No submissions were received from the Appellants.

The evidence is that Mr. Dubin has extensive experience performing environmental assessments in Hong Kong and China, experience with the Canadian, Federal Environment Assessment process, and relevant experience in assessing the environmental impact assessment process in Ontario. He does not have experience in the specific area of wind farm impacts, nor has he referred to his having personal knowledge regarding the site for this project, but he has had recent involvement in pro bono and advisory work in environment and sustainability with local government in Kingston, Ontario.

The Tribunal finds that Mr. Dubin has expertise in the Environmental Impact Assessment process. Mr. Dubin has already provided the parties and the Tribunal with his written evidence regarding the proposed project. Given that Mr. Dubin has presenter status and the fact that he will not be attending the hearing in person, the Tribunal accepts his written material and the oral evidence that he has already given on the March 7, 2013 teleconference, as his evidence-in-chief in these appeals. In regards to Mr. Dubin's evidence, and as is the case for any expert witness, the Tribunal will only consider opinions that fall within the expertise of the witness, to be expert opinion evidence. The Tribunal also notes the Director's submission supported by the Approval Holder that the Renewable Energy Approval process is different from the Environmental Impact Assessment process. This will be a factor in determining the relevance of Mr. Dubin's opinion evidence and its weight, with respect to the issues before the Tribunal. The other parties are entitled to cross-examine Mr. Dubin on his evidence.

Appendix J – Excerpt of Transcript with oral Tribunal Ruling on Dr. Beaudry, March 18, 2013

THE CHAIR: Okay, so regarding the two witnesses, for Dr. Beaudry, we are going to accept the calling of Dr. Beaudry as a witness. Yes, there are the time constraints, and in this case it is a bit mixed as there has been some advance notice of what that witness would say, albeit Mr. Gray makes a good point that the Approval-Holder and the Director have structured their case based on the information they were given when they were given it during the schedule and did not anticipate having to deal with Dr. Beaudry as a witness.

Nevertheless, there is some time we feel in the schedule. It can still fit within the schedule such as the schedule is, subject to change at the moment.

On the other hand, with Dr. Smith, we have a concern. If he is at this stage, for the very reasons that these things are to be advised earlier on in the schedule, it would cost us possibly three days in the order of things, because we don't think the Approval-Holder should be proceeding with its case and have the Appellant splitting its case effectively for after the Approval-Holder already has gotten well down the road.

So we don't think -- that certainly would be a question of fairness there. We are saying yes to Beaudry. We are not going to deal with Smith now, and the reason being we are going to be asking you folks -- we are concerned about the scheduling, and we don't think we have got enough detail here. We would like a little more detail and would like a little more certainty as to the scheduling and some thought given, so we don't get into a situation, as we have today, where to be fair to all parties we were having a witness having to come back now because we didn't get through with that witness.