

Environmental Review Tribunal
Tribunal de l'environnement



ISSUE DATE: August 11, 2015

CASE NO.:

15-010

PROCEEDING COMMENCED UNDER section 142.1(2) of the *Environmental Protection Act*, R.S.O. 1990, c.E.19, as amended

Appellant: Clarington Wind Concerns
Approval Holder: Ganaraska Nominee Ltd.
Respondent: Director, Ministry of the Environment and Climate Change
Subject of appeal: Renewable Energy Approval for ZEP Wind Farm Ganaraska
Reference No.: 1426-9RWTSS
Property Address/Description: 4027 Ganaraska Road (Regional Road 9), Part of Lots 18-22, Concession 6, Orono, Ontario
Municipality: Clarington
Upper Tier: Durham Region
ERT Case No.: 15-010
ERT Case Name: Clarington Wind Concerns v. Ontario (Environment and Climate Change)

Heard: April 13, 14 and 15, 2015 at Orono, Ontario

APPEARANCES:

Parties

Counsel/Representative⁺

Clarington Wind Concerns

Priya Vittal

Director, Ministry of the Environment and Climate Change

Alexandra Mingo

Ganaraska Nominee Ltd.

Arlen Sternberg, John Terry and Dennis Mahony

Participant

Save the Oak Ridges Moraine
Coalition

Cindy Sutch⁺ and Debbe Crandall⁺

Presenter

Alex Hegarty

Self-represented

DECISION DELIVERED BY MARLENE CASHIN, MARCIA VALIANTE AND ROBERT V. WRIGHT

REASONS

Overview and Background

[1] On January 30, 2015, Vic Schroter, Director, Ministry of the Environment and Climate Change (the “MOECC”), issued Renewable Energy Approval Number 1426-9RWTSS (the “REA”) to Ganaraska Nominee Ltd. (the “Approval Holder”) under s. 47.5 of the *Environmental Protection Act* (“EPA”). The REA is for the construction, installation, operation, use and retiring of a Class 4 wind facility with a total nameplate capacity of 17.6 megawatts (“MW”) (the “Project”), comprising nine wind turbines, one sub-station and associated infrastructure.

[2] The Project is to be constructed entirely on the Oak Ridges Moraine (the “ORM”), between Ganaraska Road (Regional Road 9) and Concession 6, east of Highway 115, in Orono, in the Municipality of Clarington, Durham Region, Ontario (the “Site”). The ORM is a significant landform with unique environmental, geological and hydrological features and functions. It is the subject of special protection under the *Oak Ridges Moraine Conservation Act, 2001*, S.O. 2001, c.31 (“ORMCA”).

[3] On February 13, 2015, the Municipality of Clarington (“Clarington”) filed a notice of appeal with the Environmental Review Tribunal (the “Tribunal”) of the decision of the Director to issue the REA. On March 12, 2015, Clarington wrote to the Tribunal proposing to withdraw its appeal, and on April 1, 2015, Clarington’s appeal was dismissed.

[4] On February 17, 2015, Clarington Wind Concerns (the “Appellant”) also filed a notice of appeal of the REA. This appeal proceeded and is the subject of this decision.

[5] On March 17, 2015, the preliminary hearing was held in Bowmanville. The Tribunal’s order dated April 1, 2015 in respect of the preliminary hearing provides additional background in this matter. At the preliminary hearing the Tribunal granted participant status to Save the Oak Ridges Moraine Coalition, an incorporated association (“STORM”).

[6] The hearing was held at the Orono Arena and Community Centre on April 13, 14, and 15, 2015.

[7] At the outset of the hearing Alex Hegarty requested status as a presenter. Mr. Hegarty owns a property in the vicinity of the Project. He told the Tribunal that he had been away at the time that notifications regarding the hearing were sent out, and that the notice had been sent to an incorrect address. The parties had no objection to Mr. Hegarty being added as a presenter. The Tribunal found that Mr. Hegarty has a genuine interest in the subject matter of the appeal and is likely to make a relevant contribution to the Tribunal’s knowledge of the matter. The Tribunal granted Mr. Hegarty presenter status pursuant to Rule 69 of the Tribunal’s *Rules of Practice*.

[8] Having reviewed all of the evidence and the written submissions of the parties, participant and presenter, the Tribunal finds that there is not sufficient evidence to show that engaging in the Project in accordance with the REA will cause serious harm to human health, or serious and irreversible harm to plant life, animal life or the natural

environment and the Appellant has not met its onus in that regard. The Tribunal, therefore, dismisses the appeal.

[9] However, in regards to components of the Project that are in areas of the ORM with high aquifer vulnerability, the Tribunal repeats the recommendation that was made by the panel of the Tribunal in *Cham Shan Temple v. Ontario (Ministry of the Environment)*, [2015] O.E.R.T.D. No. 9 (“*Cham Shan Temple*”), that the MOECC consider having a qualified Ministry groundwater reviewer sign off on all REA applications in the ORMCP area and a hydrogeological report should be prepared which investigates the interactions of surface water and groundwater.

Relevant Legislation

[10] *Environmental Protection Act*

145.2.1 (1) This section applies to a hearing required under section 142.1

(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.

(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).

(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.

(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).

Ontario Regulation (“O. Reg.”) 359/09

Natural Features and Water Bodies — Oak Ridges Moraine**Oak Ridges Moraine**

42. (1) In addition to sections 37 and 38, sections 43, 44, 45 and 46 apply to a person who is constructing, installing or expanding a renewable energy generation facility as part of a renewable energy project at a project location that is in the portion of the Oak Ridges Moraine Conservation Area that is subject to the Oak Ridges Moraine Conservation Plan.

(2) Sections 39 and 40 do not apply to a person who is constructing, installing or expanding a renewable energy generation facility as part of a renewable energy project at a project location that is in the portion of the Oak Ridges Moraine Conservation Plan Area that is subject to the Oak Ridges Moraine Conservation Plan.

Specified natural features

43. (1) No person shall engage in an activity described in Column 1 of the following Table in respect of a renewable energy generation facility as part of a renewable energy project at a project location that is in any of the locations described opposite the activity in Column 2 of the Table:

TABLE

	Column 1	Column 2
Item	Activity	Location in which activity is prohibited
1.	1. The construction, installation or expansion of a transmission or distribution line.	1. A southern wetland that is not a provincially significant southern wetland or within 50 metres of a southern wetland that is not a provincially significant southern wetland.
	2. The expansion of an existing transformer station, distribution station or transportation system.	2. A sand barrens, savannah or tallgrass prairie or within 50 metres of a sand barrens, savannah or tallgrass prairie.
	3. If it is engaged in with respect to a Class 3 solar facility, any construction, installation or expansion in addition to the activities described in paragraphs 1 and 2.	3. An area of natural and scientific interest (life science) that is mentioned in clause 27 (6) (b) or within 50 metres of an area of natural and scientific interest (life science) that is mentioned in that clause.
2.	Any construction, installation or expansion other than construction, installation or	1. A southern wetland that is not a provincially significant southern wetland or within 120 metres of a southern wetland that is not a provincially significant southern

	expansion described in Item 1.	wetland.
		2. A sand barrens, savannah or tallgrass prairie or within 120 metres of a sand barrens, savannah or tallgrass prairie.
		3. An area of natural and scientific interest (life science) that is mentioned in clause 27 (6) (b) or within 120 metres of an area of natural and scientific interest (life science) that is mentioned in that clause.

...

(3) Subsection (1) does not apply if, as part of the application for the issue of a renewable energy approval in respect of the renewable energy project, the applicant submits,

- (a) an environmental impact study report prepared in accordance with the Natural Heritage Assessment Guide, that,
 - (i) identifies and assesses any negative environmental effects of the project on a natural feature referred to in the Table to subsection (1),
 - (ii) identifies mitigation measures in respect of any negative environmental effects mentioned in subclause (i),
 - (iii) describes how the environmental effects monitoring plan set out in paragraph 4 of item 4 of Table 1 addresses any negative environmental effects mentioned in subclause (i), and
 - (iv) describes how the construction plan report prepared in accordance with Table 1 addresses any negative environmental effects mentioned in subclause (i);
- (b) written confirmation from the Ministry of Natural Resources that the report mentioned in clause (a) has been prepared in accordance with the Natural Heritage Assessment Guide; and
- (c) any written comments provided by the Ministry of Natural Resources to the applicant in respect of the project.

...

Planning Act, R.S.O. 1990, c. P.13

Interpretation

1. (1) In this Act,

...

“provincial plan” means,

...

- (c) the Oak Ridges Moraine Conservation Plan established under section 3 of the Oak Ridges Moraine Conservation Act, 2001,

...

Renewable energy undertakings Policy statements and provincial plans

62.0.2 (1) Despite any Act or regulation, the following do not apply to a renewable energy undertaking, except in relation to a decision under section 28 or Part VI:

1. A policy statement issued under subsection 3 (1).
2. A provincial plan, subject to subsection (2).

...

Oak Ridges Moraine Conservation Act, 2001, S.O. 2001, c. 31

Objectives

4. The objectives of the Oak Ridges Moraine Conservation Plan are,
 - (a) protecting the ecological and hydrological integrity of the Oak Ridges Moraine Area;
 - (b) ensuring that only land and resource uses that maintain, improve or restore the ecological and hydrological functions of the Oak Ridges Moraine Area are permitted;
 - (c) maintaining, improving or restoring all the elements that contribute to the ecological and hydrological functions of the Oak Ridges Moraine Area, including the quality and quantity of its water and its other resources;
 - (d) ensuring that the Oak Ridges Moraine Area is maintained as a continuous natural landform and environment for the benefit of present and future generations;

...

Issues

[11] The issues are:

1. Whether engaging in the Project in accordance with the REA will cause serious harm to human health.
 - Sub-issue 1(a) Noise
 - Sub-issue 1(b) Visual Impact
 - Sub-issue 1(c) Public Safety
 - Shadow Flicker
 - Ice and Debris Throw
 - Tornadoes
 - Horse Spooking
 - Interference with a Radio-communication System

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 2(a): The Oak Ridges Moraine
 - Groundwater
 - Surface Water
 - Cumulative Effects
 - Sub-issue 2(b): Harm to Birds and Bird Habitat
 - Birds and Generalized Bird Habitat
 - Bird Species At Risk

Summary of the Evidence

[12] The following is a brief summary of the witnesses who testified at the hearing and their evidence. The Discussion and Analysis sections consider the evidence in more detail.

Appellant's Evidence

[13] The Appellant called seven witnesses. Heather Rutherford, Mark Rutherford, Ross Nesbitt, Barb King, and Grant Greenwood testified about the potential health impacts of the Project; and Ms. Rutherford, Eleanor Magder, Ross Nesbitt and Jane Greenwood testified about the potential environmental impacts of the Project. The Appellant did not seek to qualify any of its witnesses as expert witnesses.

Heather Rutherford

[14] Ms. Rutherford is a resident of Orono who lives with her family on a farm adjacent to the Project Site. Her two main concerns are the effects of the Project on the health of her eldest daughter, who suffers from a disorder that is aggravated by sleep

disturbance, and the potential for the Project to cause serious and irreversible harm to the environment of the ORM, including its ecological and water features and functions.

Mark Rutherford

[15] Mr. Rutherford is the General Manager of Brimacombe, an Alpine Ski and Snowboard facility in Orono (“Brimacombe ski resort”), located directly adjacent to the proposed Project Site. His main concern is the possibility of interference with the radio-communication system used at Brimacombe ski resort due to the Project wind turbines, and a resulting risk of serious harm to human health for staff and patrons of Brimacombe ski resort.

Barb King

[16] Ms. King is the owner and operator of Homestead Hills Equestrian Centre in Orono. Her business is located approximately 1,156 metres (“m”) from the nearest proposed Project wind turbine. Her main concern is the possibility of her riders being thrown and injured, as a result of horses bolting in reaction to noise, shadows, movement and light flickering from the Project wind turbines.

Grant Greenwood

[17] Mr. Greenwood is a resident of Orono. His home is located beside the Site of the planned Project. His main concern is annoyance caused by shadow flicker, noise, and visual pollution associated with the Project wind turbines. He is also concerned about the possibility of injuries to individuals from debris or ice thrown from the blades of Project wind turbines.

Jane Greenwood

[18] Ms. Greenwood is a resident of Orono who lives beside the planned Site of the Project. Her main concern is for the birds that live in the area of the Project Site. She is concerned about Bobolinks, Barn Swallows, Eastern Meadowlarks, Red-headed Woodpeckers, and birds of prey such as Golden Eagles and Bald Eagles, which inhabit the Site and adjacent areas.

Eleanor Magder

[19] Ms. Magder is a resident of Orono. Her home has been designated as a heritage structure, and is protected under the *Ontario Heritage Act*. Ms. Magder did not give oral evidence. She adopted, and the Tribunal accepted, her written statement as her evidence in the Hearing. Her concerns are related to potential negative health effects of the Project, and that vibrations from the construction and operation of Project turbines will damage her home.

Ross Nesbitt

[20] Mr. Nesbitt is a resident of Orono, who lives near the Project Site. His main concern is that his health will be negatively affected by the construction and operation of the Project wind turbines. Mr. Nesbitt testified that he has a medical condition that forced him to retire in 1992. He is worried that his symptoms, which have lessened since retirement, will return as a result of his living in close proximity to the Project Site. Mr. Nesbitt is also concerned that construction and operation of the Project may affect the flow, and contaminate the water, of two creeks that run through his property.

Approval Holder's Evidence

[21] The Approval Holder called nine witnesses. Dr. Robert McCunney, Regis d'Astous, Dr. Paula Dupuy and Shant Dokouzian provided expert testimony regarding

the potential effects of the Project on human health, and David Eva provided non-expert evidence on specific details of the Project. The Approval Holder led expert opinion evidence regarding the potential environmental impacts of the Project through witnesses Andrew Taylor, Grant Whitehead and Mark Pomeroy (the “Stantec Panel”), and Dr. Paul Kerlinger.

David Eva

[22] Mr. Eva is the Vice President at Capstone Power Development for Ganaraska Nominee Ltd, and is a registered professional engineer. The Approval Holder did not request that the Tribunal qualify him as an expert witness. Mr. Eva’s testimony focused on the process that the Approval Holder followed to obtain the REA, the proposed operation of the Project, and how it would be monitored.

Shant Dokouzian

[23] Mr. Dokouzian is a Team Leader for Development and Engineering Services at DNV GL Energy, a company that provides services in support of energy and other developments world-wide. He has been involved in more than 20 ice throw assessments, more than 40 shadow flicker assessments and a number of overall risk assessments for wind farms. Mr. Dokouzian was qualified by the Tribunal as an engineer with expertise in noise and shadow flicker, and the design, impact assessment, including risk and public safety assessment, and post-construction monitoring of wind farms. The focus of his testimony related to shadow flicker, ice and debris throw, tornadoes, and noise.

Régis d’Astous

[24] Mr. d’Astous is a Consultant and Project Manager at Yves R. Hamel et Associés Inc. He testified that he has been working in the radio-communication industry since 1979, and since 2003 has worked extensively in the area of the impact of wind farms on

telecommunications systems. Mr. d'Astous was qualified by the Tribunal as a specialist in telecommunications technology with particular expertise in assessing the impact of windfarms on telecommunications systems. Mr. d'Astous testified regarding the potential for the Project to interfere with the radio-communication system at the Brimacombe ski resort.

Dr. Paula Dupuy

[25] Dr. Dupuy is a Doctor of Veterinary Medicine, and has been a practicing equine veterinarian for 23 years. She currently practices equine and companion animal veterinary medicine with Troy Veterinary Services in Flamborough, Ontario, and owns and operates her own stable with 7 horses and 12 ponies. Dr. Dupuy testified that she is the President of the Wind Dancer Pony Rescue Foundation, and a senior member and whipper-in of the Wellington-Waterloo Hunt Club. She further testified that she is a Director of the Rockton Agricultural Society and has been responsible for the implementation of the horse show safety protocol at that fair, and that this summer she will be serving as a veterinarian at equestrian events of the Pan American Games. She was qualified by the Tribunal as an equine veterinarian with expertise in respect of equine behaviour and safety. Dr. Dupuy's testimony related to horse behaviour and the risk of horses spooking or bolting due to the operation of Project wind turbines.

Dr. Robert McCunney

[26] Dr. McCunney is a medical doctor, certified by the American Board of Preventive Medicine in occupational and environmental medicine, a research scientist at the Massachusetts Institute of Technology Department of Biological Engineering, a staff physician in occupational/environmental medicine at Brigham and Women's Hospital in Boston, a lecturer at the Harvard School of Public Health, and a co-author of a recent review of peer-reviewed scientific literature with respect to wind turbines and human health. Dr. McCunney was qualified by the Tribunal as a medical doctor specializing in occupational and environmental medicine with particular expertise in health implications

of noise exposure. Dr. McCunney's testimony included general facts about sound, and a review of published research and data that he says informed the opinions and conclusions expressed in his witness statement. His testimony also responded specifically to concerns regarding potential health impacts of the Project, raised in the witness statements of Ms. Rutherford, Mr. Nesbitt, Ms. Magder, and Mr. Greenwood.

Stantec Panel

[27] The Stantec Panel was composed of Messrs. Taylor, Whitehead and Pomeroy. They submitted a joint witness statement, and each member gave oral testimony as to his qualifications and opinions on various aspects of the Project. The Panel's testimony focused on the Project's potential impact on (i) groundwater and natural features and wildlife within the ORM as a result of potential groundwater impacts; (ii) surface water; (iii) birds; and (iv) the structures on the property owned by Ms. Magder located at 6720 Jewel Road.

Andrew Taylor (Stantec Panel)

[28] Mr. Taylor is a Senior Ecologist and Project Manager at Stantec. Mr. Taylor testified that since joining Stantec in 2005 he has provided terrestrial ecology expertise for a wide range of projects, including renewable energy and infrastructure projects. With regard to wind energy developments in particular, he testified that he has been involved in over 20 projects across Ontario, completing and overseeing numerous pre-construction wildlife surveys, post-construction monitoring plans, and wildlife field studies. The Tribunal qualified Mr. Taylor as an expert terrestrial ecologist with expertise assessing the impacts of wind energy projects, including on birds. His testimony focused on the potential negative impacts to birds and bird habitat at the Project Site as a result of Project construction and operation.

Grant Whitehead (Stantec Panel)

[29] Mr. Whitehead is a Hydrogeologist and a registered Professional Geoscientist. He has been a Project Manager at Stantec since 2002. He testified that for the past 15 years, he has either managed and/or been the principal investigator for numerous groundwater supply and protection evaluations, regulatory agency permitting and compliance studies, and a variety of groundwater monitoring and hydrogeological impact investigations throughout Ontario. He stated that he has a thorough understanding of the geological and hydrostratigraphic framework of the ORM, having completed several field-based and desktop-level hydrogeological investigations within or in close proximity to it. He further testified that he has experience performing hydrogeological impact assessments for renewable energy based developments, including large scale wind developments. Mr. Whitehead was qualified by the Tribunal as an expert hydrogeologist with expertise in assessing groundwater systems.

Mark Pomeroy (Stantec Panel)

[30] Mr. Pomeroy is a Project Manager and Senior Fisheries Biologist at Stantec since 2004. Mr. Pomeroy testified that he has led or been involved in the aquatic component of a range of projects, including aquatic assessments, environmental impact statements, constraint analyses, environmental implementation reports, environmental assessments, watercourse restoration, construction mitigation plans, as well as during- and post-construction monitoring of measures to mitigate impacts to aquatic ecosystems. He also testified that through his involvement in over 20 Ontario-based wind energy developments, he developed mitigation strategies to reduce or eliminate impacts to watercourses. Mr. Pomeroy was qualified by the Tribunal as an expert fisheries biologist with expertise assessing water features and the impacts of wind energy projects on water features.

Dr. Paul Kerlinger

[31] Dr. Kerlinger is a Senior Biologist and Principal at Curry & Kerlinger, LLC. Since 1994, Dr. Kerlinger has worked on the impacts of wind turbines and communication towers on birds, and has been a team leader for preconstruction studies for roughly 3,000 wind turbines now operating in the United States. He was qualified by the Tribunal as an expert on birds and the impacts of wind energy projects on birds. Dr. Kerlinger's testimony focused on how a biologist would define and assess (i) "serious harm", and "irreversible harm" to a bird population, and (ii) the likely impacts of the construction and operation of the Project to various types of birds known to inhabit the area of the Project Site.

Director's Evidence

[32] The Director did not call any witnesses.

Participant and Presenter

STORM

[33] The Participant, STORM, gave evidence through the written and oral presentations of Cindy Sutch, Chair of the Board of STORM, and Debbe Crandall, Policy Advisor and the previous Executive Director of STORM. Established in 1989 to raise awareness of the sensitivity of the ecology of the ORM, STORM has been active in expressing concerns with proposed large-scale renewable energy projects on the ORM since 2009. The main focus of the evidence given by Ms. Sutch and Ms. Crandall was a review of the legislation and other tools in place to ensure the protection of the ORM, Niagara Escarpment, and Protected Countryside Areas of the Greenbelt. They also reviewed the objectives of legislation designed to protect highly sensitive environmental areas. STORM's concerns were summarized under the issue headings:

(a) scale and cumulative effects assessment; (b) contention that green energy was not anticipated to cause any impacts on the ORM; and (c) hydrogeological concerns.

Alex Hegarty

[34] Mr. Hegarty is a property owner living in close proximity to the Project Site. He spoke briefly at the hearing about his concerns regarding the potential impact of wind projects on human health and property values, saying that the only people who will benefit from the Project are the farmers and other people on whose land the wind turbines will be built. He expressed concerns regarding vibrations and low frequency sound from the wind turbines, and the need for hydrological studies, which would include hydrogeological studies.

Issue 1: Whether Engaging in the Project in Accordance with the REA will Cause Serious harm to Human Health.

Discussion, Analysis and Findings

Sub-issue 1(a): noise

[35] The Appellant has the onus of proving on a balance of probabilities that engaging in the Project in accordance with the REA will cause serious harm to human health. The Appellant argues that the harmful health effects to be expected from the operation of the Project include:

...sleep disturbance, headache, tinnitus, ear pressure, dizziness, vertigo, nausea, visual blurring, tachycardia, irritability, problems with concentration, memory and panic episodes associated with sensations of internal pulsation or quivering when awake or asleep, excessive tiredness, loss of quality of life and the further impacts that these effects can lead to, these being increased morbidity and significant chronic disease and health effects.

[36] Ms. Rutherford, Mr. Nesbitt, Ms. Magder, and Mr. Greenwood testified to their concerns about the potential effects of noise on their health and that of their families and neighbours. The one expert witness qualified to give opinion evidence in the area of the health effects of noise exposure was the Approval Holder's witness, Dr. McCunney. Dr. McCunney's opinion is that the evidence is not sufficient to conclude that noise associated with the Project will cause serious harm to human health.

[37] Ms. King testified about the effect of noise from the Project turbines on her horses, and the potential for such noise to cause them to "spook" or "bolt". This issue is addressed below under the heading "horse spooking".

[38] Ms. Rutherford testified that the substation for the Project will be sited 395 m west of her family home, and that the nearest turbine will be 865 m away. She referred to the Approval Holder's Noise Assessment Report, which indicates that the combination of noise from the turbines and the substation is predicted to be 36.5 dBA. She expressed her view that this level of audible sound and infrasound will cause sleep disturbance resulting in an exacerbation of her daughter's medical disorder. Ms. Rutherford cited the World Health Organization ("WHO") report *Adverse Health Effects of Noise* as saying: "if negative effects on sleep are to be avoided the equivalent sound pressure level should not exceed 30 dBA indoors for continuous noise." She also cited articles respecting the effects of infrasound from wind turbines on human health.

[39] Dr. McCunney testified that the WHO night time noise guidelines indicate that outdoor sound levels of 45 dBA or less are not associated with significant awakenings. He also explained that indoor noise levels are attenuated by buildings, so that they are significantly lower than outdoor noise levels. He said that, to estimate indoor noise levels, outdoor noise levels are generally reduced by 10 to 15 dBA, or 20 dBA if windows are closed. As a result, even if using the most cautious attenuation estimate number of 10 dBA, an outdoor noise level of 36.5 dBA would be attenuated to an indoor noise level of 26.5 dBA or less. Even though he did not examine her or her medical records, it is Dr. McCunney's opinion that noise at this level will not cause Ms.

Rutherford's daughter's sleep to be disrupted to the point of aggravating her condition, if at all.

[40] Dr. McCunney also stated it is his opinion that the audible and sub-audible components of wind turbine sound do not contribute to health risks for people living near wind turbines. Based on his 2014 critical review of the scientific literature, he stated that there "are no scientific studies ... that demonstrate adverse health effects from sub-audible infrasound at the levels encountered near homes in the vicinity of wind turbines."

[41] The Tribunal finds that although Ms. Rutherford is understandably concerned for her daughter, and the potential effect of sleep disruption that the Project might cause her, there is insufficient evidence to demonstrate that an outdoor noise level of 36.5 dBA, and an estimated indoor noise level of 26.5 dBA or less, will cause sleep disturbance or serious harm to her health.

[42] Mr. Nesbitt also has concerns regarding the effects of noise on his health. Mr. Nesbitt's home is located 792 m from where the nearest turbine will be sited. It appears from the Noise Assessment Report that the predicted outdoor noise level at his home would be 35.4 dBA. Mr. Nesbitt described the symptoms of his medical condition as including headaches, dizziness, visual problems, muscle aches and pains, numbness in his legs, and difficulty sleeping. He testified that his symptoms have lessened considerably since he retired, and that he is concerned that sound and infrasound generated from the Project will affect his health, although he does not know if that will happen in fact. Dr. McCunney, in response to Mr. Nesbitt's concerns, testified that he reviewed the relevant scientific and medical literature. He stated that he was not aware of any studies that suggest that people with Mr. Nesbitt's condition are at risk of experiencing exacerbated symptoms as a result of levels of environmental noise associated with living near wind turbines.

[43] The Tribunal acknowledges Mr. Nesbitt's concern, but finds that there is not sufficient evidence to demonstrate that noise from the Project's wind turbines will aggravate Mr. Nesbitt's symptoms or cause serious harm to his health.

[44] Mr. Nesbitt also raised concerns about "dirty" electricity, which generally refers to electromagnetic energy that flows along various conductors, and its potential effect on persons having pre-existing symptoms of his condition. He attached articles to his witness statement regarding health risks associated with "dirty" electricity. In response, Dr. McCunney said that through his experience with occupational and environmental medicine he is very familiar with the scientific literature making such claims. Having evaluated the studies attached to Mr. Nesbitt's witness statement and a 2010 review of the literature, Dr. McCunney concluded that the claims in the studies cannot be relied upon because they have severe problems of methodology, data analysis, and data interpretation, and that existing scientific studies do not establish a causal link between "dirty" electricity and adverse health effects.

[45] The Tribunal notes that no evidence was provided to indicate the sources or levels of "dirty" electricity emanating from the Project that would be experienced at Mr. Nesbitt's home. The Tribunal finds that there is not sufficient evidence to show that engaging in the Project in accordance with the REA will cause serious harm to Mr. Nesbitt's health due to "dirty" electricity.

[46] Ms. Magder's witness statement states that her home is 752 m from the nearest wind turbine and raises a concern about the Project's impact on her health; however, she does not say what specific concerns she has. As a result, Dr. McCunney said that he is unable to assess Ms. Magder's concerns regarding the potential impact of noise on her health, noting only that in his opinion, "no clear or consistent association is seen between wind turbine noise and any reported disease or other indicator of harm to human health."

[47] The Tribunal finds that no evidence has been produced to show that engaging in the Project in accordance with the REA will cause serious harm to Ms. Magder's health.

[48] Mr. Greenwood expressed the view that wind turbine noise is associated with annoyance, which in turn adversely affects human health. He cited the 2014 report by Health Canada, "Wind Turbine Noise and Health Study: Summary of Results" (the "Health Canada Study Summary") in support of his view.

[49] Dr. McCunney testified that he is familiar with the Health Canada Study Summary, and said that:

The Summary did report that annoyance toward several wind turbine features, such as noise, shadow flicker, blinking lights vibrations and visual impacts, were found to be statistically *associated* with increasing levels of wind turbine noise. However, as the study authors expressly noted, this finding is not sufficient to draw a conclusion regarding causation.

[50] Dr. McCunney explained that the authors of the Health Canada Study Summary noted that it is a preliminary discussion of unpublished results, and that the study results "do not permit any conclusions about causality" and "should be considered in the context of all published peer-reviewed literature on the subject."

[51] The Approval Holder urges the Tribunal to follow the finding of the Ontario Divisional Court in *Dixon v. Director, Ministry of the Environment*, 2014 ONSC 7404 ("*Dixon*"), where, at para. 86, the court, referring to the Health Canada Study Summary, said:

To the extent that the Health Canada Study suggested that there was an association between wind turbine noise and annoyance, it did not suggest anything which was unknown or disputed in the K2 and Armow Wind Project hearings. The opinion evidence before the Tribunal in those hearings was that an association was not sufficient to permit an inference of causation. The Health Canada Study dealt with the association between the two, but specifically declined to state an affirmative conclusion about causation.

[52] Since its release in 2014, the Health Canada Study Summary has been cited in many Tribunal hearings. However, the Tribunal was not convinced in any of those hearings that the Health Canada Study Summary provided sufficient evidence that annoyance associated with wind turbine noise would cause serious harm to human health in the context of those projects. The Tribunal notes that final results from the study have not yet been published in peer-reviewed publications and no further report interpreting the results of the study beyond the 2014 summary report was put into evidence.

[53] The Tribunal finds that, while the Health Canada Study Summary found an association between wind turbine noise and annoyance, there has been no advance in the development of its results since the decision of the Divisional Court in *Dixon*, and there was no further evidence provided in this proceeding, to be able to conclude that engaging in the Project in accordance with the REA will cause serious harm to human health due to annoyance resulting from wind turbine noise.

Sub-issue 1(b): visual impact

[54] Mr. Greenwood also testified that the Project will cause “visual pollution”, which will contribute to annoyance and thus to adverse health effects. He noted that the wind turbines will be 146.25 m above the ground, with a rotor diameter of 92.5 m, so that they will “tower over” nearby residents and be visible for a great distance. In his view, the Project is not consistent with a peaceful rural area having open vistas. He cited the Health Canada Study Summary to support his assertion that annoyance with wind turbines is due to visual impacts as well as noise and that annoyance adversely affects health.

[55] As he did regarding wind turbine noise, Dr. McCunney testified that the scientific evidence has not moved beyond showing an *association* between the visual impacts of wind turbines and annoyance.

[56] In its decision in *Moseley v. Ontario (Ministry of the Environment)* (2014), 87 C.E.L.R. (3d) 116, the Tribunal addressed the link between visual impact and the Health Test in s. 145.2.1 of the *EPA*, as follows:

[124] The Tribunal accepts from the testimony of the participants and presenters in this hearing that they will all more likely than not have a negative emotional reaction to the sight of wind turbines in the Goulais Bay area, where they have hitherto only experienced natural vistas and the tree line on the horizon. Several individuals have articulately described the psychological connections they will make upon seeing wind turbines: lack of voice, lack of democracy, intrusion of industry into what some see as sacred space, and “callous disregard for other non-compatible uses of the land”.

[125] At the same time, the Tribunal notes that these are subjective reactions. It is a reasonable assumption that other individuals who have not sought status in these proceedings may have a positive psychological response to the sight of wind turbines, perhaps associating them with such things as a future with lower carbon emissions, or, for participating receptors, they may symbolize financial benefits. In this regard the purpose of a REA appeal must be kept in mind. An appeal before the Tribunal is not a consultation process to gather general input from all who have an opinion, even if the concerns are valid and point to real flaws in the siting process; it is an adjudicative exercise designed to determine, on the basis of relevant evidence, whether an appellant meets the test laid out in s.145.2.1(2).

[126] The legal test the Tribunal must apply is not whether overall well-being is diminished; it is whether the Project will cause *serious harm* to human health. There is no evidence in this proceeding that annoyance *per se* is a serious health effect amounting to serious harm to human health.

[127] The Tribunal finds that the visual impact of the turbines in the Project has not been shown in this case to cause serious harm to human health. ...

[57] The Tribunal agrees with the approach taken in that decision; that is, that there must be evidence linking visual impact of wind turbines to serious harm to health. The Tribunal finds that there is insufficient evidence in this case to show that engaging in the

Project in accordance with the REA will cause serious harm to human health due to annoyance related to visual impact.

Sub-issue 1(c): public safety

[58] The Appellant submits that there are various public safety risks of wind energy projects, and that this Project will cause serious harm to human health due to shadow flicker, ice and debris throw, tornadoes, horse spooking, and interference with the Brimacombe ski resort radio-communication system. Each of these is addressed in separate sections below.

[59] The Tribunal heard testimony from the Appellant's lay witnesses, Mr. Greenwood, Mr. Rutherford, and Ms. King, and the Approval Holder's expert witnesses Mr. d'Astous, Mr. Dokouzian, and Dr. Dupuy on public safety risks alleged to be associated with wind turbines generally, and the Project specifically.

Shadow Flicker

[60] Mr. Greenwood raised concerns about shadow flicker, caused when a wind turbine blade passes between an observer and the sun, at his home east of Turbine 8 and on Highway 35/115 and the Ganaraska Road. He refers to the data contained in the Project Shadow Flicker Report as it relates to his property, and notes that the worst case calculation for his property is approximately 47 hours of shadow flicker per year. He says that homeowners should not be required to plant trees in order to mitigate the effects of shadow flicker as recommended by the Approval Holder, and that in any case, trees grow slowly and would obstruct a scenic view. Mr. Greenwood linked shadow flicker at his home to annoyance and linked it on the roads to driver distraction and a risk to road safety.

[61] Ms. King also expressed her concern about shadow flicker on her property due to Project wind turbines. However, Mr. Dokouzian confirmed with reference to the Shadow Flicker Report that there will, in fact, be no shadow flicker at Ms. King's farm, so there can be no shadow flicker concern.

[62] In response to Mr. Greenwood's concern, Mr. Dokouzian said that shadow flicker modeling is conservative and represents the "astronomical worst case", and that the "worst case maximum shadow flicker" set out in the Shadow Flicker Report cited by Mr. Greenwood does not represent what actual shadow flicker will be. As Mr. Dokouzian explained, shadow flicker modeling assumes that the turbine blades are a solid disc, that the turbine is always facing the sun and the sun is never obscured by clouds or fog, and does not take into account the time that the turbine blades are not spinning either due to lack of wind, maintenance, or attenuation resulting from obstacles such as vegetation, other buildings, or aerosols in the air. Mr. Dokouzian also noted that, the worst case also treats the receptor building as a giant greenhouse with one large window facing the turbine, when in reality window orientation will affect the amount of annual flicker. In his opinion, the amount of actual shadow flicker predicted at Mr. Greenwood's property, as reflected in the Shadow Flicker Report, would be in the order of 10 hours per year, which in Mr. Dokouzian's opinion is a "low" amount of shadow flicker.

[63] As to Mr. Greenwood's concerns about the potential for shadow flicker on highway 35/115 and the Ganaraska Road, it is Mr. Dokouzian's opinion that drivers on those roads will not be adversely affected or distracted by shadow flicker from the Project. He explained in oral testimony that "someone who is driving is passing very quickly through a flicker from a turbine and will experience that flicker effect for a very small amount of time."

[64] The Shadow Flicker Report indicates that the highest levels of shadow flicker will be close to the wind turbines. It does not predict what the expected levels will be along Highway 35/115 or Ganaraska Road, but in Figure 5-1, there is a shadow map which

shows that the worst case levels along these roads will, at a few locations, be 30 hours per year. Along most sections of these roads, the worst case levels will be below 10 hours per year.

[65] The Tribunal finds that there is not sufficient evidence to show that shadow flicker from the wind turbines of the Project will cause serious harm to the health of Ms. King, Mr. Greenwood or others on their properties, or to drivers on highway 35/115 and the Ganaraska Road.

Ice and Debris Throw

[66] In his witness statement, Mr. Greenwood raises a concern relating to the risk of ice throw and “debris throw” from turbine blades, which includes blade failure or blade separation.

[67] In Mr. Dokouzian’s opinion, the risk of ice or debris throw occurring, particularly when a person is in the vicinity of a turbine, is very low. Mr. Dokouzian explained that the Project’s Senvion MM92 turbine is a reliable turbine, widely used and specially equipped for cold climates. He testified that the model is designed so that, if ice is detected, the turbines will shut down and can only be manually restarted after a visual inspection to determine whether any ice is still present. As well, he said that the Approval Holder will place signage at the access roads to warn of the potential for ice-shedding. Mr. Dokouzian’s opinion is that the steps described above are appropriate to mitigate the risk of ice throw happening and the risk of a person being harmed, should ice throw occur.

[68] With respect to the risk of blade failure, or “debris” throw, Mr. Dokouzian noted that in 2005 the risk of blade failure was estimated to be 1 in 1,600 (0.0006) turbines per year. He testified that the overall blade failure rate worldwide has declined since the early 1990s, and it is projected that the rate will continue to decrease. Mr. Dokouzian said that these estimates have been “particularly conservative in the context of current-

day commercial wind turbines as the various root-causes of blade failure had been continuously addressed through developments in best practice in design, testing, manufacture, and operation.” One reason for this is that in the event of structural failure, modern wind turbine blades are designed to buckle prior to any detachment, as a safety measure. Mr. Dokouzian explained that to calculate the likely incidence of detachment of a turbine blade and resulting injury to an individual, it would be necessary take into consideration: (i) the probability of a blade failing, (ii) the probability of a blade or part of a blade detaching from the turbine as a result of the failure, and (iii) the probability of a person being present and being struck by the detached part. Mr. Dokouzian also indicated that to date he is not aware of any such injury ever having occurred.

[69] The Appellant submits: “individuals may be affected by debris from the turbines or ice thrown from the rotating blades which could result in serious injury”. The Appellant also argues that although there have been no reported injuries from ice throw, it is the turbine companies themselves who report on whether there have been injuries, and some may have occurred but gone unreported, thus underrepresenting the actual risk. The Approval Holder submits that Mr. Greenwood’s concerns about ice and debris throw or other types of turbine failure are without merit, and the Director points out that there is no expert evidence that accidents related to ice throw are not accurately reported.

[70] The Tribunal finds that there is not sufficient evidence to demonstrate that debris or ice thrown from the blades of the Project’s wind turbines will cause serious harm to people.

Tornadoes

[71] In his witness statement, Mr. Greenwood also raised concerns about how tornadoes could affect Project wind turbines and, in turn, cause harm, saying that,

A tornado has also occurred in this area recently. The attached photos (Tabs 8 & 9) show the tornado north of our house approximately one km from where the turbines will be located. This tornado overturned and broke the tops from numerous trees in its path. I am concerned as to how the turbines could affect the nearby residences if this situation was to occur again. This would be an even greater concern if the turbines were located too close to the property line.

[72] Mr. Dokouzian responded to Mr. Greenwood's concerns, by saying in his witness statement that:

33. When tornados occur, they present a focused, localized weather event. They are not widespread and cover a discrete area along their paths. There is a very low chance of a tornado colliding with a wind turbine in Ontario.

34. The Durham region experiences approximately 1 tornado every 5,000 to 10,000 years, per square kilometre. The project size covers approximately a 1 square kilometre area, which would therefore result in a probability of approximately 1 tornado to enter the project area every 5,000 to 10,000 years. In addition, close to half of tornados in Ontario are of F0 strength on the Fujita scale, which would not necessarily result in major damage to a wind turbine. On the Fujita scale, F0 represents "*Light damage*: some damage to chimneys; branches broken off trees; shallow rooted trees pushed over; sign boards damaged."

35. There are other North American regions, such as the states of Kansas, Oklahoma, Indiana and Illinois, which experience approximately three times as many tornados per square kilometre. They have a similar order of magnitude of wind power installed, with no known injuries.

36. To my knowledge, there has not been a tornado and wind turbine incident in Ontario to date. If this unlikely event were to happen, in my opinion the risk of damage to the wind turbine is not more than the risk of detrimental impact on neighbouring residences and farms. In addition, the REpower MM92 turbine proposed for this project is known to be very reliable, and to have a very low failure rate.

37. Tornado events are typically monitored, and the likelihood of human presence near a wind turbine during such an event is low, which decreases substantially the already low risk of harm.

[73] Neither the Appellant nor the Director made specific submissions regarding the risk of tornadoes causing serious harm to human health. The Approval Holder however, submits that the risk of a tornado entering the Project Site is very remote and neither the expert evidence, nor the evidence of the fact witnesses establishes that the Project will result in any harm, much less serious harm, to health as a result of tornadoes.

[74] The Tribunal finds that the only evidence before it suggests that tornadoes are very unlikely to occur in the Project Site during the life of the Project. The Tribunal finds that there is not sufficient evidence to demonstrate that engaging in the Project in accordance with the REA will cause serious harm to human health due to tornadoes.

Horse Spooking

[75] Horse spooking was raised by Ms. King, owner of Homestead Hills Equestrian Centre, as a potential risk to the health and safety of riders and others at her facility, resulting from the operation of the Project's wind turbines. She testified that,

when a horse bolts, spooks or runs from the turbine, an inexperienced rider may not be able to remain in the saddle, and therefore may get thrown off, onto the ground, into a structure, or get trampled by another spooking/bolting horse.

[76] Ms. King said that horses have the largest eyes of any land mammal and are a flight animal, rather than a predator animal, so they instinctively have developed a flee response by relying on their monocular motion vision, to detect movement. She testified that she is concerned that the Project wind turbines, with their movement, light flickering, and shadows could make her horses bolt, and that the sound of the turbines could also produce a flight reaction.

[77] Ms. King further testified that,

Transport Canada has already recognized that the animals in our facility require a more sensitive approach. Several years ago we were ... having planes practicing low training approaches over our equestrian centre and these exercises were creating severe problems with our animals. The horses were being frightened by the noise and motion created by the low flying aircraft. Flight school students and instructors were told to avoid this air space altogether during training activities.

[78] Dr. Dupuy, the Approval Holder's witness, qualified by the Tribunal to give expert testimony as to equine behaviour, does not agree with Ms. King regarding the likelihood that her concerns regarding horses and the welfare of riders on Ms. King's property will be realized. Dr. Dupuy does not believe that the operation of the Project wind turbines will add any material risk of "spooking" or harm to horses or riders.

[79] Dr. Dupuy testified that different horses react differently to the same stimuli, with some being described as "bombproof", meaning that they will remain calm and undisturbed in almost any circumstance, and others being more prone to reacting to sudden motions or sounds. Even animals that are more prone to sudden reactions acclimatize over a short period of time, Dr. Dupuy explained, giving several examples of horses adapting to new sights and sounds in brief periods of time. Dr. Dupuy also noted in her testimony that riding instructors address the safety of their pupils on a daily basis by ensuring that their horses are properly suited to the experience level of their riders, with beginner riders being matched with "bombproof" horses. As well, she said, beginner riders at Ms. King's facility take their lessons in the indoor arena, and should not be affected at all by the wind turbines more than 1 kilometre ("km") away, and that instructors also ensure that the immediate teaching environment is relatively free of distractions. Dr. Dupuy testified in cross-examination that horses get used to changes "very quickly."

[80] The Appellant submits that "the activity of the turbine combined with the shadow flicker will result in the horses at times being spooked or bolting, resulting in possible injury or harm to the riders or individuals within their vicinity." The Approval Holder submits that, "based on the uncontradicted expert evidence, this Project should not pose any increased safety risk for the inexperienced riders about whom Ms. King raised a concern, let alone cause any serious harm to health." The Director submits that the Appellant has not provided any evidence to counter Dr. Dupuy's evidence or shown that her evidence is inaccurate or invalid.

[81] The Tribunal finds that the risk of horses spooking or bolting and injuring riders at Ms. King's facility is unlikely. Having weighed the evidence of Ms. King and Dr. Dupuy, the Tribunal prefers the expert evidence of Dr. Dupuy. As she explained, in her experience, horses adapt to changes to their surroundings, which will reduce the risk of spooking. In addition, in this context, the horses will be more than 1 km away from the nearest turbine and the least experienced riders will be indoors, on calmer horses, under controlled conditions, so that there is minimal risk of spooking and injury. The Tribunal finds that there is not sufficient evidence to demonstrate that engaging in the Project in accordance with the REA will cause serious harm to the health of horse riders or attendants as a result of horse spooking.

Interference with a Radio-communication System

[82] Mr. Rutherford, the general manager of the Brimacombe ski resort, expressed concern that the Project's Design and Operations Report states: "the tower and blades of wind turbines can interfere with radio communication". He believes that the proposed Project creates the potential for a genuine public safety emergency at Brimacombe ski resort. Mr. Rutherford explained in his witness statement that the ski resort uses approximately 50 two-way radios distributed between all indoor and outdoor operations departments, and that clear, concise and reliable radio communication is crucial to the safe operation of ski lifts, including the ability to contact first responders in the event of an injury and maintenance personnel in the event of a breakdown of a ski lift.

[83] In response, Mr. d'Astous, the Approval Holder's expert witness in telecommunications technology, stated in his witness statement:

If Brimacombe is using a simplex frequency to communicate directly from radio to radio, I am certain that there will not be any impact at all. To produce significant degradation, the signal reflected by the wind turbine needs to be received at a power equivalent to the direct signal received from the transmitting radio. Given the location of the Brimacombe resort and the location of the wind farm, the reflected signal will probably be three or four orders of magnitude less powerful than the direct signal.

[84] Mr. Rutherford confirmed during his oral testimony that Brimacombe ski resort does use a simplex frequency to communicate directly from radio to radio. Mr. d'Astous responded in his oral testimony that, "radio waves are regulated by certain physics rules. It's not physically possible that any wind turbine in [the Project] would impact the direct communications that are roughly one kilometer away or more."

[85] The Approval Holder submits that Mr. Rutherford acknowledged in his oral testimony that he is not "an expert in radio communications or wind turbine construction," that his evidence on these issues merely raises concerns from a lay perspective about the potential for harm from the Project, and that only Mr. d'Astous' evidence should be relied upon by the Tribunal.

[86] Based on the unchallenged expert testimony provided by Mr. d'Astous, the Tribunal finds that there is no credible evidence to suggest that engaging in the Project in accordance with the REA will cause serious harm to human health as a result of interference with the Brimacombe ski resort radio-communication system.

Conclusion on Issue 1

[87] The Tribunal agrees with the positions of the Director and the Approval Holder that the Appellant's witnesses and the presenters have raised, "at most, lay-expressions of concern about the *potential* for harm from the project and have therefore failed to bring sufficient evidence to satisfy the statutory test that the project *will cause* serious harm to human health". The Tribunal finds that the Appellant has not met its onus of showing that engaging in the Project in accordance with the REA will cause serious harm to human health.

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.

Discussion, Analysis and Findings

Sub-issue 2(a): The Oak Ridges Moraine

[88] The entire Project would be located on the ORM, within the “Countryside Areas” land use designation of the Oak Ridges Moraine Conservation Plan, O. Reg. 140/02 (the “ORMCP”), made under the *ORMCA*. Further, some of the Project components would be located in the area identified as “high aquifer vulnerability” under the ORMCP. The Appellant submits that the Project will cause serious and irreversible harm to the natural environment of the ORM, in particular water features and functions, and the REA should therefore be revoked. In addition, STORM submits that the Tribunal should recommend a moratorium on the approval of industrial scale wind energy projects on the ORM pending the outcome of the provincial review of the ORMCP, currently underway.

[89] In *Visconti v. Ontario (Ministry of the Environment)* (2013) 83 C.E.L.R. (3d) 218 (“*Visconti*”), the first appeal of a renewable energy project on the ORM (a solar project), the Tribunal accepted minutes of settlement and dismissed the appeals, observing, at para. 66:

On an appeal of the approval of a renewable energy project, or when considering whether to accept a settlement agreement in the context of the EPA appeal test, the Tribunal finds that it may consider whether the area in question has a special designation (e.g., the Oak Ridges Moraine) when considering “serious and irreversible” harm in relation to the appeal test and when considering the factors on the settlement or withdrawal of an appeal under the Tribunal’s Rules...

At para. 72 of the decision the Tribunal further observed and recommended:

...either there is a need for further public discussion to determine whether there is a basis for STORM's concern about hydrological evaluations and the renewable energy approval process for projects on the Oak Ridges Moraine, or the public needs to be better informed as to why the provisions of O.Reg. 359/09 specifically dealing with the Oak Ridges Moraine are adequate in this regard.

[90] In *Cham Shan Temple*, the Tribunal held at para. 308 that “compliance with the ORMCP is not a matter within its jurisdiction in this proceeding” but also ruled that the Appellants could “pursue issues raised in the notice of appeal regarding the ORM ... insofar as they relate to the *EPA* tests of serious harm to human health or serious and irreversible harm to plant life, animal life or the natural environment.”

[91] The Tribunal noted further, in para. 312, that O. Reg. 359/09 to the *EPA* “expressly contemplates construction of renewable energy generation projects on the ORM, in any land use designation, provided that certain steps are followed,” and went on to state, at para. 316:

It is not the proper role of the Tribunal to comment on whether provincial government policy with respect to the interplay between renewable energy and protection of the ORM is wise, nor is it appropriate to make a blanket policy decision to reject all renewable energy projects on the ORM. In a REA appeal, the role given to the Tribunal in the *EPA* is to carefully consider the site-specific evidence to determine whether a particular Project will cause serious and irreversible harm to plant life, animal life or the natural environment. The Tribunal has consistently stated that it interprets the Environmental Test on a case-by-case basis. To that end, the Tribunal considers all evidence presented to it that is relevant to the local environmental context and determines whether there is proof that the project will cause the requisite harm. The presence of a special designation or of particularly vulnerable water features, land forms and habitats, as identified under other legislation or regulations, including the ORMCP, and the impacts of the project on those special features, to the extent relevant to the Tribunal's role under the *EPA*, may be considered by the Tribunal in making its determination in an individual proceeding.

[92] The panel of the Tribunal in this proceeding agrees with the observations in *Visconti* and *Cham Shan Temple* and will follow their approach in considering the ORM and the Project. It will consider the evidence presented, including evidence regarding impacts on the special features and functions of the ORM, to determine whether it is sufficient to prove that the Project will cause serious and irreversible harm to the natural environment.

[93] The evidence raised several areas of concern with respect to the impacts of the Project on the ORM groundwater and surface water, and the cumulative effects of several wind energy developments on ORM features and functions.

Groundwater

[94] The Appellant and STORM point out that the Approval Holder did not complete a hydrogeological study of the Project. They argue that, without one, the impacts of the Project on groundwater cannot be fully understood and, as a result, the Approval Holder is unable to prove that the Project will not cause harm to the local groundwater system. Ms. Rutherford testified that she believes the Project will have an adverse impact on local aquifers because the Project components located in an area of “high aquifer vulnerability” will interfere with groundwater recharge. She also stated her belief that a spill from the Project would contaminate the aquifer and that construction of the Project could interfere with local drinking water wells.

[95] The Approval Holder’s expert witness, Mr. Whitehead, a hydrogeologist, provided his opinion that the Project will not adversely affect groundwater recharge due to the small footprint of the Project components and the small area, 0.59 ha, that will become impervious surface because of the Project’s infrastructure. He estimated the total area of impervious surface to be 0.35% of the subwatershed, noting that such an amount is far below the regulated upper limit of 10% of the subwatershed found in the ORMCP. It was Mr. Whitehead’s opinion that these factors will ensure that precipitation will continue to infiltrate into the native soils.

[96] Mr. Whitehead also stated that he does not consider groundwater contamination to be likely. He noted that contamination would be most likely to occur during the construction phase, but he identified several protocols the Approval Holder must follow that will reduce the risk of a spill and respond to any spill that does occur. Mr. Whitehead also testified that, based on his review of bore hole samples, the Project will be constructed in the overburden, below which there is an impermeable layer of till, ranging in depth below ground surface (“BGS”) from 2.0 m to 18.5 m with an average thickness of 9.3 m, above the regional aquifer. He also noted that the bore holes at the two turbines to be located in the area of high aquifer vulnerability indicate the presence of till from ground surface to a minimum depth of 4.6 m BGS, with groundwater encountered at depths below 5.6 m BGS. According to Mr. Whitehead, this impermeable layer will be an effective barrier to any contaminant reaching the aquifer, so that any spill that did occur would not be likely to have an impact on groundwater quality.

[97] Mr. Whitehead indicated that he had reviewed the MOECC well records within 2 km of the Project area and he concluded that construction of the Project will not cause interference with local drinking water wells. He noted that the average depth of wells in the area is 40 m BGS, in the deep aquifer, whereas the Project components will all be located in the overburden, well above the deep aquifer.

[98] In the ORMCP, “aquifer vulnerability” is defined to mean: “an aquifer’s intrinsic susceptibility, as a function of the thickness and permeability of overlying layers, to contamination from both human and natural impact on water quality.” Under s. 29(5) of the ORMCP, certain uses are prohibited in such areas, including disposal and storage of certain wastes and storage of potentially toxic materials.

[99] In *Cham Shan Temple*, the Tribunal stated, at para. 356, that although a hydrogeological study is not a regulated requirement for wind energy projects located on the ORM,

... a precautionary approach to protecting the natural environment in this circumstance, where there are sensitive water features present, should have involved a hydrogeological assessment. ... The absence of a hydrogeological report means that predictions made about impacts on water resources will be more uncertain. It is not, however, evidence that there *will* be serious and irreversible harm to the natural environment.

The Tribunal went on in that decision to recommend that the MOECC consider having a qualified Ministry groundwater reviewer sign off on all REA applications in the ORMCP area and consider requiring preparation of a hydrogeological report that would investigate the interactions of surface water and groundwater where a renewable energy project is proposed in an area of high aquifer vulnerability.

[100] In this proceeding, there was some confusion over which components of the Project would be located in the area of high aquifer vulnerability. Ms. Rutherford said that the sub-station and Turbine 4 would be within that area. This is also indicated in the 2013 Water Bodies Impact Assessment Report, prepared for the Approval Holder by its consultants, M.K. Ince Associates Ltd. ("M.K. Ince"). By contrast, Mr. Whitehead's evidence was that Turbines 4 and 12, along with associated access roads and cabling, but not the sub-station, would be located in the area of high aquifer vulnerability.

[101] A geotechnical assessment of the wind turbine locations was done on behalf of the Approval Holder, and seeps and springs were evaluated in the Water Bodies Assessment Report; however, there was no full hydrogeological assessment carried out. Although such an assessment would have provided more complete information, the Approval Holder's hydrogeologist did provide evidence with respect to groundwater and the soils underlying the Site.

[102] Mr. Whitehead's opinion is that the Project is not likely to have an adverse impact on groundwater recharge, groundwater quality or drinking water wells in the area. Mr. Whitehead considered information about soil composition and well records in reaching his opinion. He calculated the amount of impervious surface that will be added to the

subwatershed and concluded that this amount will have a minor impact on infiltration rates. The “subwatershed” is defined in the ORMCP to mean “an area that is drained by a tributary or some defined portion of a stream.” In s. 27, the ORMCP prohibits development and site alteration if “they would cause the total percentage of the area of the subwatershed that has impervious surfaces to exceed ... 10 per cent... .” This was the only evidence before the Tribunal as to what degree of impervious surface might lead to serious impacts on the groundwater system. Mr. Whitehead’s calculation of an increase in impervious surface in the subwatershed of 0.35% was not challenged. There was no evidence indicating what the existing level of impervious surface is in the subwatershed and no evidence that the increase due to the Project would go beyond the 10% threshold.

[103] Ms. Rutherford’s evidence raised important concerns about the impacts of the Project on the groundwater system in the area of the Project; however, the Tribunal finds that the Appellant has not provided any specific evidence to counter Mr. Whitehead’s opinion or the factual bases for his opinion. In addition, the REA directs the Approval Holder to follow a set of mitigation measures. These are outlined in several of the Project reports, including in the Design and Operations Report, and include measures to prevent and contain spills and leaks of petroleum, oils and lubricants. In addition, there is a commitment to use porous material for project roads and crane pads and to grade the Site to promote continued groundwater recharge.

[104] Thus, even though some components of the Project will be constructed in an area of high aquifer vulnerability, there is no evidence that construction or operation of the Project is likely to interfere significantly with groundwater recharge or cause contamination of the aquifer and local drinking water wells. The Tribunal finds that the Appellant has not demonstrated that engaging in the Project in accordance with the REA will cause serious and irreversible harm to the groundwater system.

Surface Water

[105] The Appellant submits that there are 10 water courses within the Site that will be adversely affected by the Project. Mr. Nesbitt testified with respect to two creeks that traverse his property, one of which he says supports fish and amphibians. He expressed a concern that construction and operation of the Project will contaminate the creeks and interfere with their flow.

[106] The Approval Holder's consultant, M.K. Ince, prepared a Water Assessment Report and a Water Bodies Impact Assessment Report, detailing its investigation of the presence of "water bodies" as defined in O. Reg. 359/09 located within the "Project area". The Project area is the area that comprises the "project location" as defined in O. Reg. 359/09 plus 120 m measured from the outside boundary of the project location.

[107] The Water Assessment Report identified 10 potential water bodies within the Project area, and one was added following the site investigation. Based on the site investigation, five of these water bodies were determined either to be outside the Project area or not to meet the definition of "water bodies" in the regulation. Thus, six water bodies were studied to determine the potential environmental impacts on them from construction and operation of the Project. This report was followed by development of the Environmental Effects Monitoring Plan and mitigation measures in the Construction Plan Report. Reviewing the maps and the discussion of the candidate water bodies in the Water Assessment Report, it appears that the creeks referred to by Mr. Nesbitt are located outside of the Project area and thus were not evaluated further.

[108] The Approval Holder's fisheries biologist with expertise assessing water features, Mr. Pomeroy, reviewed these Project reports and testified regarding the potential impacts of the Project on surface water. Mr. Pomeroy noted that none of the Project components would be located within 30 m of a water body, which is the setback required by O. Reg. 359/09. In addition, he stated his opinion that implementation of

the mitigation measures identified in the Project reports make it unlikely that the Project will cause adverse impacts to any water bodies or their ecological functions.

[109] There was no evidence presented to suggest that the Water Assessment Report and the Water Bodies Impact Assessment Report are in error about the location or categorization of the various water bodies within the area studied. While it is clear that the possibility exists for direct or indirect effects on surface water bodies, particularly during the construction phase, the Approval Holder has identified mitigation, monitoring and contingency measures to address this possibility. These include: the avoidance of areas close to water bodies, avoidance of disturbance of riparian vegetation, daily visual monitoring of construction, use of erosion and sedimentation control measures, off-site vehicle refuelling and maintenance to minimize storage of petroleum, oils and lubricants, spill containment equipment maintained on the Site, training of staff, and emergency response planning.

[110] In addition, section G of the REA requires the application of best management practices for stormwater management in all phases of the life of the Project, and section K of the REA outlines the requirements for construction, operation, and monitoring of a spill containment facility at the sub-station. The Appellant did not suggest that these measures were inappropriate or potentially ineffective and did not identify any other measures that should have been included. It is Mr. Pomeroy's opinion that, if these measures are implemented, the Project is unlikely to cause adverse impacts to water bodies or their functions. The Tribunal accepts this evidence and finds that the Appellant has not demonstrated that engaging in the Project in accordance with the REA will cause serious and irreversible harm to surface water.

Cumulative Effects

[111] STORM submits that the Tribunal should consider the cumulative effects of several wind energy projects on the features and functions of the ORM. According to STORM, there are five wind energy projects located on the ORM that are either

approved or in the approval process, but the Ontario government has not yet studied the issue of whether large scale energy development should be allowed at all on the ORM. It was Ms. Crandall's evidence, from her personal knowledge and involvement with the adoption of the ORMCP in 2001, that wind energy was not contemplated in the development of the ORMCP infrastructure policies. STORM asks the Tribunal to recommend a moratorium on industrial scale energy generation plants until a proper cumulative effects assessment can be concluded as part of the government review of the ORMCP.

[112] The Tribunal's jurisdiction is limited by the terms of the statutes that govern it. Under the *EPA*, on a REA appeal, the Tribunal can only provide a remedy, such as revoking or altering the approval decision of the Director or directing action by the Director, if it first finds that engaging in the Project in accordance with the REA will cause serious harm to human health or serious and irreversible harm to plant life, animal life or the natural environment. The Tribunal can consider evidence of cumulative effects in making its findings on whether the Project will cause serious and irreversible harm.

[113] However, neither STORM nor the Appellant provided evidence as to the specific types or degree of effects the five wind energy projects will have on the ORM, or evidence that the Project, combined with the other wind energy projects, will cause serious and irreversible effects to the ORM.

[114] The Tribunal finds that neither STORM nor the Appellant has demonstrated that engaging in the Project in conjunction with other wind energy projects will cause serious and irreversible harm to plant life, animal life or the natural environment of the ORM.

[115] To summarize, the Tribunal finds that the Appellant has not met its onus of demonstrating that engaging in the Project in accordance with the REA, and the cumulative effects of several wind energy developments, will cause serious and

irreversible harm to the features and functions of the ORM, including groundwater and surface water.

Sub-issue 2(b): Harm to Birds and Bird Habitat

[116] The Appellant submits that the Project will cause serious and irreversible harm to birds and their habitat. Ms. Greenwood provided evidence for the Appellant with respect to several species of birds, including species at risk (“SAR”). Mr. Taylor and Dr. Kerlinger provided evidence for the Approval Holder respecting birds and bird habitat. In the following sections, birds and bird habitat are first addressed generally and then with specific reference to identified SAR.

Birds and generalized bird habitat

[117] Ms. Greenwood stated her belief, based on her review of the Natural Heritage Assessment (“NHA”) documents prepared by the Approval Holder’s consultant, M.K. Ince, that proper avian studies were not conducted. She noted that there is reference to an avian baseline survey but it is not included in any of the NHA documents. She also stated that she only found reference to bird surveys carried out in the winter months and that she considers this to be inadequate to determine the presence of breeding birds in the Project area.

[118] In response, Mr. Taylor testified that he reviewed the studies done by M.K. Ince and found that numerous avian surveys were in fact carried out in accordance with provincial guidelines, including winter raptor surveys, breeding bird surveys, and site investigations of bird habitat. He stated that these surveys did not find raptors, owls, Whip-poor-will, Common Nighthawk, or Red-headed Woodpecker nesting in the Project area and eventually ruled out the presence of significant bird habitat. Mr. Taylor also identified the monitoring and mitigation measures included in the REA that will minimize any potential impacts to birds and bird habitat. It is his opinion that construction and

operation of the Project are expected to have a negligible effect on individual birds and on the habitat of bird species generally.

[119] Dr. Kerlinger agreed with Mr. Taylor's opinion, noting that the Project will have a small footprint and will be built primarily on cleared agricultural land, so that the impacts should be similar to those at other wind energy projects in similar terrain, that is, not significant. His opinion is that he does not consider the generalized bird habitat to be rare or sensitive.

[120] There is no foundation for Ms. Greenwood's position that M.K. Ince failed to conduct appropriate bird surveys in the Project area. Most of the NHA documents were not put into evidence, but the evidence that is before the Tribunal indicates that the site investigation work required to identify significant habitat and the evaluation of the impacts of the Project on generalized bird habitat were conducted and submitted with the REA application.

[121] The evidence is that the Project will be built on land that is already highly disturbed by agricultural activities. There was no evidence identifying any part of the Project area as significant bird habitat. In addition, the REA requires the Approval Holder to implement the commitments made in the report on the Environmental Effects Monitoring Plan for the Project, including restricted tree-clearing during the breeding season. In addition, there is no evidence before the Tribunal demonstrating that there will be significant bird mortality associated with the Project. Post-construction mortality monitoring is required as a condition of the REA, so that the Approval Holder and the Ministry of Natural Resources and Forestry ("MNR") will be alerted to any unusual pattern of mortality due to the Project and the Approval Holder will be required to implement mitigation measures.

[122] The Tribunal finds that the evidence does not demonstrate that engaging in the Project in accordance with the REA will cause serious and irreversible harm to birds or generalized bird habitat.

Bird Species at Risk

[123] Ms. Greenwood also stated that she and other local residents have sighted Bobolink, a SAR, within the Project area, and that their presence was noted in M.K. Ince biologists' field notes, but there was no reference to the species in the NHA documents. She expressed the view that the Project will cause permanent damage to the habitat of Bobolink and Eastern Meadowlark, both of which are "threatened" species, reduce foraging and nesting sites, displace birds and subject them to the risk of collision with the wind turbines. She stated that without a mitigation strategy in place, the Project will cause serious and irreversible harm to these SAR.

[124] With respect to SAR, Mr. Taylor stated that M.K. Ince identified Bobolink, Eastern Meadowlark and Barn Swallow as present within the Project area, although no Barn Swallow nesting structures were found there. Mr. Taylor estimated that, in total, 0.7 ha of Bobolink and Eastern Meadowlark habitat will be impacted, due to direct removal for Project infrastructure, temporary removal during construction, and displacement, calculated at 100 m around each turbine. He referred to the 100 m buffer as "conservative". It is his opinion that this amount of affected habitat will not have any significant impact on these species.

[125] Mr. Taylor noted that, nevertheless, because this is SAR habitat, the Approval Holder must obtain authorization from the MNRF pursuant to the *Endangered Species Act, 2007* ("ESA") prior to commencing activities affecting any amount of that habitat. The conditions for this authorization include the provision of 4 hectare ("ha") of compensating habitat and management to protect nesting, for the life of the Project. He noted that O. Reg. 242/08 under the *ESA* requires compensating habitat of 1:1, with a minimum of 4 ha. Dr. Kerlinger stated his opinion that this mitigation will benefit the two species because it will represent a net gain in suitable habitat and dedicated management. In his opinion, this type of mitigation is "rather simple and straightforward and has been shown to be successful elsewhere."

[126] The Appellant argues that, because there is no requirement that compensating habitat be located within the same region as the Site, there will likely be a net loss of local Bobolink and Eastern Meadowlark habitat, seriously and irreversibly harming the local population.

[127] The location of the compensating habitat has not been established but even if it were outside of the vicinity of the Site, the Tribunal finds that the Appellant has not shown that the amount of habitat affected (0.7 ha) would have a serious impact on the success of these species.

[128] In fact, the evidence in this case is that 0.7 ha is not a significant amount of habitat. According to the MNR *Recovery Strategy for the Bobolink (*Dolichonyx oryzivorus*) and Eastern Meadowlark (*Sturnella magna*) in Ontario (2013)*, in Ontario both Bobolink and Eastern Meadowlark nest primarily in hayfields and pastures that act as surrogate native grasslands and their breeding success is dependent on how those fields are managed. Further, it states that “Bobolink is sensitive to habitat patch size, preferring larger grasslands (i.e., generally >10 ha),” but will nest in grasslands ranging from 5 to 10 ha if the patch is surrounded by open landscape. The Tribunal finds that the Appellant has not shown that the Project will cause serious and irreversible harm to the local population of Bobolink and Eastern Meadowlark due to habitat loss.

[129] Ms. Greenwood testified that there will be Bobolink fatalities due to collisions with the wind turbines in the Project. She cited the MNR *Recovery Strategy*, which indicates that Bobolink is among the top 10 of species killed by wind turbines. Dr. Kerlinger testified that, in his opinion, the number of fatalities of Bobolink and Eastern Meadowlark due to collisions with operating wind turbines will be low and consistent with the rates at other wind energy projects in similar landscapes. He stated that the information in the *Recovery Strategy* is outdated, and cited data from 33 projects in Ontario for which post-construction mortality data are available. That information indicates that, overall, fatalities occur at a rate that is less than one-half of the threshold

rate set out in the REA. He stated that, in his opinion, there is no reason to expect the results to be different with this Project.

[130] Mr. Taylor also provided his opinion that Bobolink and Eastern Meadowlark mortality due to collisions with wind turbines is expected to be very small. He relied on mortality data found in the Wind Energy Bird and Bat Monitoring Database (the “Bird Monitoring Database”), a joint initiative of The Canadian Wind Energy Association, the Canadian Wildlife Service of Environment Canada, Bird Studies Canada and the MNRF. He noted that mortality data from all wind energy projects in Ontario must be entered into the Bird Monitoring Database.

[131] The Appellant submitted that the fact that members of the community cannot enter data raises a question about whether the reported information is accurate or misrepresented. The Bird Monitoring Database catalogues the carcasses that are found during the required post-construction monitoring at wind turbines across Canada. In Ontario, the collection of carcasses follows a standard protocol, which may underestimate the actual mortality rates for different species. However, there is not sufficient specific evidence in this proceeding to conclude that the Bird Monitoring Database is in fact unreliable because community members cannot enter data into it.

[132] Dr. Kerlinger testified that, according to the Bird Monitoring Database, Eastern Meadowlark accounted for 0.09% of bird fatalities in Ontario to date, while Bobolink accounted for 2.39% of such fatalities in Ontario. For this Project, only one of the wind turbines is located in what qualifies as suitable habitat for these species. Thus, while fatalities may occur, there is no evidence to suggest that there will be a serious impact on even the local population of either species due to collisions. The Tribunal finds that the Appellant has not shown that the Project will cause serious and irreversible harm to bird SAR as a result of collisions.

[133] Ms. Greenwood also stated her view that bird SAR will be displaced due to the Project. Dr. Kerlinger testified that there is a growing body of studies on displacement of bird species due to wind turbines. In his opinion, based on these studies, displacement will be minimal or non-existent and will not cause serious harm to bird SAR. Mr. Taylor agreed, noting that recent studies show a small amount of displacement, at most within 50 to 100 m of a turbine, for grassland birds. The Appellant brought no evidence to the contrary. The Tribunal finds that the Appellant has not shown that the Project will cause serious and irreversible harm to bird SAR as a result of displacement.

Conclusions on Issue 2

[134] The Tribunal finds that the Appellant has not brought sufficient evidence to meet the *EPA* statutory burden of proof of showing, 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.

Overall Conclusion

[135] 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 or that it will cause serious and irreversible harm to plant life, animal life or the natural environment.

DECISION

[136] The Tribunal dismisses the appeal by Clarington Wind Concerns and confirms the decision of the Director.

Appeal Dismissed

"Marlene Cashin"

MARLENE CASHIN
MEMBER

"Marcia Valiante"

MARCIA VALIANTE
MEMBER

"Robert V. Wright"

ROBERT V. WRIGHT
VICE-CHAIR

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Environmental Review Tribunal

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Website: www.elto.gov.on.ca Telephone: 416-212-6349 Toll Free: 1-866-448-2248