



Environmental Review Tribunal

Case Nos.: 12-098/12-100

Haldimand Wind Concerns v. Director, Ministry of the Environment

In the matter of appeals by Haldimand Wind Concerns filed on July 31, 2012, and Peter Slaman filed on August 1, 2012, 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 2869-8VDRCV issued by the Director, Ministry of the Environment, on July 17, 2012 to Capital Power GP Holdings Inc. under section 47.5 of the *Environmental Protection Act*, regarding the construction, installation, operation, use and retiring of a Class 4 wind facility with a total name plate capacity of 104.4 megawatts located within the County of Haldimand and County of Norfolk; and

In the matter of a hearing held on October 1, 2, 9, 11, 15, 16, 18, 22 and November 26, 2012 at the Fisherville Community Centre, 18 Main St. West, Fisherville, Ontario, and via teleconference on October 5, 12, 23 and 26, 2012.

Before: Dirk VanderBent, Panel Chair
Heather I. Gibbs, Vice-Chair

Appearances:

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| Eric Gillespie and
Graham Andrews | - | Counsel for the Appellant, Haldimand Wind Concerns |
| Betty Ortt and
Ernie King | - | Representatives for the Appellant, Haldimand Wind Concerns |
| Peter Slaman | - | Appellant, on his own behalf |
| Adam Chamberlain and
Aimee Collier | - | Counsel for the Approval Holder, Capital Power GP Holdings Inc. |
| Robert Dewalt | - | Articling Student for the Approval Holder, Capital Power GP Holdings Inc. |
| Nicholas Adamson and
Nadine Harris | - | Counsel for the Director, Ministry of the Environment |
| Meredith Cairns | - | Articling Student for the Director, Ministry of the Environment |

Dated this 31st day of January, 2013.

REASONS FOR DECISION

Background and Overview

[1] On July 17, 2012, Vic Schroter, Director, Ministry of the Environment (“MOE”), issued renewable energy approval (“REA”) No. 2869-8VDRCV to Capital Power GP Holdings Inc. (“Capital Power” or the “Approval Holder”) pursuant to s. 47.5 of the *Environmental Protection Act* (“EPA”). The REA grants approval for the construction, installation, operation, use and retiring of a Class 4 wind facility with 58 1.8 megawatt (“MW”) wind turbine generators with a total name plate capacity of 104.4 MW in the Counties of Norfolk and Haldimand, known as the Port Dover and Nanticoke Wind Project (the “Project”).

[2] Both Haldimand Wind Concerns (“HWC”) and Peter Slaman filed notices of appeal of the REA, pursuant to s. 142.1 of the *EPA*. HWC alleges that engaging in the Project in accordance with the REA will cause serious harm to human health. Mr. Slaman also alleges the Project will cause serious harm to human health, and adds 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.

[3] There were a number of motions heard in the course of this proceeding, including two motions to adjourn brought by HWC, both of which were dismissed by the Environmental Review Tribunal (the “Tribunal”). Written reasons were issued on October 24, 2012 (*Haldimand Wind Concerns v. Ontario (Ministry of Environment)*, [2012] O.E.R.T.D. No. 53) and December 7, 2012 (*Haldimand Wind Concerns v. Ontario (Director, Ministry of the Environment)*, 2012 CarswellOnt 16710). These orders contain further background to these appeals. The hearing began on October 1, 2012, in Fisherville, Ontario.

[4] Following the Tribunal’s dismissal of HWC’s second motion to adjourn, HWC informed the Tribunal and all parties that it would be presenting no evidence. HWC continued to participate in the hearing by questioning witnesses called in Mr. Slaman’s appeal, and making final submissions.

[5] Mr. Slaman tendered no evidence with respect to human health. He argues that the Project will cause serious and irreversible harm to plant life, animal life or the natural environment due to both bird collision mortality and bird habitat loss.

[6] The Approval Holder retained Stantec Consulting Limited (“Stantec”) to conduct the necessary field work and prepare the studies and reports required by O. Reg. 359/09 (the “Regulation”). These include a Natural Heritage Assessment (“NHA”), an Environmental Impact Study (“EIS”), jointly referred to as the “NHA/EIS”, and an Environmental Effects Monitoring Plan (the “EEMP”), all of which were submitted to the Ministry of Natural Resources (“MNR”) on behalf of the Approval Holder in support of its application for the REA.

[7] Mr. Slaman’s evidence focuses on two bird species in particular: the tundra swan and the turkey vulture. He alleges the harm will occur because:

- The background studies and baseline information used for the NHA/EIS are inadequate and under-report habitat usage by tundra swans and turkey vultures. The bird surveys were performed by unqualified personnel, at the wrong time of year, with restricted views of the Lake Erie coastline.
- The NHA errs in finding no significant wildlife habitat (“SWH”) for tundra swans and turkey vultures in the Project area. As a result, the Project will cause serious and irreversible harm because:
 - the mitigation measures included in the EIS and EEMP to address predicted impacts, will be ineffective, partly because they contain no provisions for monitoring tundra swan mortality or impact on habitat; and
 - there is inadequate monitoring for future and cumulative impacts.
- Collision mortality will occur for both tundra swans and turkey vultures, causing serious and irreversible harm.

[8] HWC supports Mr. Slaman’s position, and in its submissions refers to additional concerns. HWC submits that the REA has no provisions to monitor the Approval Holder’s compliance with the conditions, in particular during construction.

[9] The Director and the Approval Holder both take the position that the Appellants have not established that there will be serious harm to human health, or serious and irreversible harm to plant life, animal life or the natural environment as a result of the Project.

[10] The Tribunal finds that Mr. Slaman has raised a number of significant concerns with respect to baseline studies and ongoing monitoring requirements of the Project's impact on tundra swans and their habitat. The Tribunal therefore makes recommendations for the consideration of the Director and the Approval Holder on these points.

[11] However, for the reasons that follow, the Tribunal finds that the Appellants have not established either that the Project as approved will cause serious harm to human health, or that the Project as approved will cause serious and irreversible harm to plant life, animal life or the natural environment. As a result, the Tribunal dismisses the appeals.

Relevant Legislation and Regulation

[12] The relevant legislation and regulation are set out in Appendix A.

Issues

- [13]
1. Whether engaging in the renewable energy project in accordance with the renewable energy approval will cause serious harm to human health;
 2. Whether engaging in the renewable energy project in accordance with the renewable energy approval will cause serious and irreversible harm to plant life, animal life or the natural environment. The following sub-issues were raised in this proceeding:
 - a. Whether serious and irreversible harm will be caused to tundra swans and turkey vultures through collision mortality, and
 - b. Whether serious and irreversible harm will be caused to animal life or the natural environment through loss of tundra swan or turkey vulture habitat.

Discussion, Analysis and Findings

Issue 1: Whether engaging in the renewable energy project in accordance with the renewable energy approval will cause serious harm to human health.

[14] In its final submissions, HWC filed academic articles on relevant topics including the importance of the precautionary principle, and the World Health Organization definition of health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity". Mr. Slaman submitted that wind

projects should not be approved without more certainty around their impacts to human health.

[15] Given that no evidence was called with respect to how this Project will cause serious harm to human health, the Appellants have not met their onus under s. 145.2.1(3) of the *EPA*, and the Tribunal dismisses this aspect of their appeals.

Issue #2: Whether engaging in the renewable energy project in accordance with the renewable energy approval will cause serious and irreversible harm to plant life, animal life or the natural environment. The following sub-issues were raised in this proceeding:

- a. Whether serious and irreversible harm will be caused to tundra swans and turkey vultures through collision mortality, and**
- b. Whether serious and irreversible harm will be caused to animal life or the natural environment through loss of tundra swan or turkey vulture habitat.**

HWC's appeal

[16] The Tribunal first turns to HWC's evidence and submissions. As noted above, HWC supports Mr. Slaman's position, relying on the grounds and evidence adduced in support of his appeal. HWC did not call any witnesses or evidence of its own. The matters raised by HWC are well summarized in the conclusions and recommendations in HWC's submissions, provided by Betty Ortt:

CONCLUSIONS AND RECOMMENDATIONS:

- Wildlife surveys presented were done at the wrong time of year. How many others were done at the wrong time?
- Surveys were only done for some seasons and not for 3 complete years.
- Site investigations and surveys were not thorough, missing items of habitat and species of concern and absence of acquiring local resident knowledge.
- Site investigations and survey requirements must follow scientific monitoring protocol and scientific rigor.
- Site investigations and surveys should be monitored by independents.
- Not all organizations were contacted for their data (Bird Studies Canada).
- Some significant wildlife habitats have project components within 120 m.
- Cutting of 6 acres of spruce trees should not be allowed.
- Construction monitoring must be included in approval documents.

- All required monitoring included in the NHA Environmental Impact Study and in the Environmental Effects Monitoring Plan should be listed in the Approval.
- There is no monitoring of the proponent during pre-construction, construction and post-construction.
- Independents should monitor all the proponents' monitoring & make detailed monitoring reports available to the public.
- Bird mortality monitoring should continue for the life of the project so that monitoring/reporting of species at risk mortality will continue.
- Effects of wind projects on mammals, wild turkeys and all wildlife need to be studied.
- Cumulative effects of multiple wind projects on all wildlife need to be studied and included in Natural Heritage Assessments.
- The MNR needs to update their records of significant habitats, wildlife use of habitats then accordingly update their habitat criteria & use smaller Eco-District criteria which is more specific/relevant to an area.

[17] The Tribunal has carefully considered the evidence obtained by HWC through cross-examination, as well as its detailed submissions which give rise to the conclusions and recommendations cited above.

[18] The Tribunal makes findings respecting several of these submissions in its disposition of Mr. Slaman's appeal below. Regarding the remaining submissions, the Tribunal finds that, at best, the evidence raises concerns respecting the methodology used in identifying some species habitat in the Project area. Other than this, HWC's submissions more generally assert that there are deficiencies in the MNR's Natural Heritage Assessment guidelines. HWC also maintains that construction and post-construction monitoring requirements are inadequate. However, for all these matters, the Tribunal finds that HWC did not buttress these concerns by adducing sufficient evidence to establish that any of the concerns raised will cause serious and irreversible harm to plant life, animal life, or the natural environment.

Mr. Slaman's appeal

[19] Mr. Slaman alleges that harm will be caused generally to birds, bats and butterflies, through collision mortality and loss of habitat. However, apart from tundra swans and turkey vultures, he did not adduce evidence specific to any other species. Thus, the Tribunal's analysis and findings in this Decision consider only his submissions and evidence in respect of tundra swans and turkey vultures.

[20] Mr. Slaman also asserted that the construction of access roads to allow heavy equipment to transport large wind turbine components would compact the soil. He testified that, based on his experience as a farmer, such compaction would interfere with existing water flow in the areas adjacent to these roads. He argues, in particular,

that soil compaction will negatively impact wetlands, where the roads are located close to wetlands. This, however, is the full extent of his evidence. The Tribunal finds that, at best, Mr. Slaman's evidence only raises a potential concern of interference with habitat due to soil compaction, which falls far short of meeting the statutory test.

[21] The Tribunal now turns to the main grounds of Mr. Slaman's appeal.

Mr. Slaman's evidence

[22] Mr. Slaman testified in these proceedings, and called as a witness Dr. Scott Petrie. Dr. Petrie is a research scientist and the Executive Director of Long Point Waterfowl, who has studied waterfowl in the area, including tundra swans. He was qualified by the Tribunal as an expert in waterfowl migration, breeding, feeding, and habitat. The following information related to the tundra swan is taken from Dr. Petrie's evidence, and the scientific studies filed with the Tribunal on this species.

[23] There is an Eastern Population ("EP") and a Western Population of tundra swans in North America. It is the EP that uses the north shore of Lake Erie as a staging area during the extensive annual migration from its wintering grounds on the Atlantic coast, to its arctic breeding grounds. By the time the swans leave their wintering grounds in North Carolina and along the shores of Chesapeake Bay which borders on Virginia and Maryland, they are at their lowest annual body mass. They travel 700 km to the north shore of Lake Erie, which is the first staging area in their migration, arriving in approximately early March. Studies by Dr. Petrie conclude they spend between 17-33 days in southern Ontario, roosting on Lake Erie and traveling inland to agricultural fields to feed on residual grains and corn, usually twice per day. During this important spring staging period, the tundra swans are replenishing and acquiring nutrient reserves for their energy needs to continue the 2,400-3,500 km migration north, and to begin breeding once they arrive in the arctic. In the fall, they migrate slowly, stopping to forage along the way, accompanied by their young cygnets who learn their migration route by remaining with their parents for both the fall and succeeding spring migrations.

[24] In the spring migration, mass arrival at the Lake Erie staging areas is variable. It has been as early as February 28. Typically the entire migrating population is present by mid-March. The swans depart once they accumulate sufficient body weight for the remainder of their migration. Access to plentiful cereal grains can accelerate this weight gain, allowing them to leave earlier. However, they will remain longer if they are held back by cold weather, so their departure from the area varies annually.

[25] There is little precision with respect to when the birds are found in southern Ontario, but a study co-authored by Dr. Petrie, *Migration chronology of Eastern tundra*

swans (Petrie and Wilcox, NRC Canada 2003; Can. J. Zool. Vol. 81), notes that “all birds left the Great Lakes in late March or early April”. The actual dates of arrival in, and departure from, the Great Lakes region appears to depend on a number of variables, including food availability in wintering sites and staging areas:

early departure from wintering areas may be a function of food depletion on wintering areas and the ready availability of waste agricultural grains and new-growth winter wheat on spring staging areas. The long duration of spring migration also may be influenced by the need for adults to arrive on breeding grounds with ample reserves for reproduction and the fact that migration speed is limited by the availability of ice-free areas as birds travel northward. (at 866-867)

[26] Dr. Petrie estimated in a 2002 article, *Population Trends and Habitat Use of Tundra Swans Staging at Long Point, Lake Erie* (Petrie, Badzinski and Wilcox, *Waterbirds* 25 (Special Publication): 143-149, 2002) that the EP tundra swan population has doubled in the last 40 years, and now surpasses 100,000.

[27] Dr. Petrie theorizes that one of the factors contributing to the increased use of Long Point by EP tundra swans over the past decades has been a change in their diet to agricultural grains (during spring staging) and the shoots of winter wheat (in fall). He notes there has been a 204% increase in corn production in Norfolk County since 1961. Tundra swans are more likely to feed on agricultural grains during the spring migration, as submerged aquatic vegetation is less available due to spring ice-cover.

[28] Tundra swans spend 52% of their life cycle in staging areas. In *Migration chronology of Eastern tundra swans*, cited above, the authors note at p.869 that “conservation of staging habitats is critical, as EP tundra swans spend half of their life migrating between Atlantic-coast wintering areas and Arctic breeding areas”.

[29] In their 2002 article on population trends, cited earlier, authors Petrie, Badzinski and Wilcox observe at p.148 that the proximity of agricultural fields to wetlands is most important during the spring migration:

Seasonal differences in propensity to feed in fields appear to influence wetland selection by Tundra Swans at Long Point. During spring, when swans spend considerable time in agricultural fields, they concentrate on wetlands closest to fields, presumably between fields and aquatic roosting sites. Conversely, in autumn, when Tundra Swans are foraging primarily on aquatic vegetation, they often use wetlands up to 30 km from agricultural fields.

[30] The other bird species that was the focus of evidence in this hearing was the turkey vulture. Evidence indicates that the highest number of turkey vultures is present in the Project area during their fall migration. Stantec notes at p. 3.4 of the NHA that a

total of 11 raptor species were observed actively migrating during the eight week survey period from September 2 to October 26, 2009, “the majority (62%) of which were turkey vultures. Peak numbers of turkey vultures occurred on October 8, 2009, with 120 individuals”.

[31] The witness statement of Steven Pelletier, in evidence before the Tribunal, gives further background on this species. It notes that “while turkey vultures are not true raptors, they are diurnal migrants that exhibit flight characteristics similar to hawks and other raptors and are typically included as raptors during hawk watch surveys”.

[32] Mr. Slaman is a retired farmer who has lived in the Port Dover area for a number of years. He has developed a particular interest in turkey vultures and tundra swans, both of which he observes on his property and in the area. Mr. Slaman’s interest in these proceedings is on behalf of the environment, and in his view, the environment is not protected by the relevant MNR guidelines.

[33] Mr. Slaman argues that the bird surveys, conducted on behalf of the Approval Holder, were done at inappropriate times for tundra swans and turkey vultures, resulting in a significant under-reporting of those species. Ten fall raptor surveys were conducted from September 2 to October 26, 2009, which found a total of 523 turkey vultures, or an average of 52.3 vultures per day. Mr. Slaman states in his submissions that “I can look out of my home and see 120 or more turkey vultures most any day in season.”

[34] With respect to tundra swans, he testified they are seen in this area in late February or early March, with March 15 being the end of the season. By the end of March, only the stragglers in poorer health would still be around. He filed video evidence and photographs of tundra swans in agricultural fields within the Project area.

[35] Mr. Slaman raises a concern regarding the driving surveys undertaken by Stantec as part of the NHA to view tundra swans. He argues that the driving route includes very few locations from which the lakeshore can be seen, as much of the shoreline in the Project area is privately owned and the coast cannot be viewed from the road. As a result, he believes many tundra swans that were roosting on the water or shoreline would not have been counted. Mr. Slaman includes the following information at para. 41 of his final submissions, which he cites from Bird Studies Canada: “110,000 swans are reported to be here every spring from mid-nineties to the present, 2012.”

[36] In Dr. Petrie’s testimony, he referred to a scientific study in Denmark involving Bewick’s swans, which were feeding in agricultural fields in great numbers. Researchers found that, when turbines were placed in those fields, the swans’ use of

the fields dropped to almost zero. Dr. Petrie stated that this was tantamount to habitat loss. The study led to the following recommendations (the “Danish recommendations”):

- i. Do not place turbines within 1 km of significant staging or roosting wetlands,
- ii. Do not place turbines in important migration corridors, and
- iii. Do not place turbines in fields used by foraging waterfowl.

[37] Dr. Petrie also discussed the Erie Shores wind project in Port Burwell, Ontario, which he described as directly adjacent to Long Point. Long Point is situated within a major flight corridor where thousands of waterfowl fly inland to feed. It is located some distance from the Project area, approximately 25 km west of Nanticoke. He indicated that he consulted with the developer in that case who agreed to change the proposed location of industrial wind turbines near large wetlands by a further 2-3 km (although Dr. Petrie would have preferred 5 km). Dr. Petrie considered this to be favourable involvement, and a good compromise.

[38] In this case, Dr. Petrie testified that Capital Power is proposing to build turbines adjacent to continentally significant habitat, which Canada has an international obligation to protect under the International Migratory Bird Treaty. Dr. Petrie testified that Stantec did not accept his offer of data for this Project area respecting the tundra swan and scaup duck species.

[39] Dr. Petrie stated he is not overly concerned about the population of waterfowl, but about displacement from key staging and feeding habitat. He cited material by the American Bird Conservancy that the north shore of Lake Erie is where birds are particularly vulnerable to impacts of wind developments.

[40] Dr. Petrie criticized the 120 m setback requirement in the NHA/EIS process, which he stated is not appropriate for waterfowl. He testified that 120 m is the smallest setback guideline in the world, for which no one has given him a biological justification. The Danish recommendation is 1,000 m. In addition, he asserts that many of the turbines are proposed within the 120 m boundary.

[41] Dr. Petrie also expressed his view that the NHA is severely lacking in scientific rigour, was not based on biological principles, and did not use the best available science or data in Canada or Europe. Examples of lack of scientific rigour include:

- The waterfowl surveys are inadequate. In this regard:
 - There were an inadequate number of waterfowl surveys. While Mr. Slaman focuses on the tundra swans, Dr. Petrie testified that many other

waterfowl use the region. He indicated that 10 surveys were conducted during two calendar years, four in the period from March 27 to 31, 2009, and six in the period from March 15 to April 1, 2010. He stated that this number is insufficient, noting that European studies suggest multiple years are appropriate.

- The surveys that were conducted include only a narrow range of weather conditions, so it is impossible to draw conclusions from them.
 - The qualifications of individuals conducting the surveys were not provided.
 - The tundra swan surveys were conducted too late in the spring. A study conducted by Dr. Petrie indicates that they leave in mid-March to early April. Dr. Petrie stated that more extensive data was available which could provide a more detailed description of the range for departure dates including mean and median dates, but he did not have this data at hand when giving his testimony.
 - The tundra swan surveys were “standing surveys” rather than aerial.
 - The value of the surveys conducted is negligible. The type of monitoring was unreplicated non-randomized short-term monitoring. Dr. Petrie would have designed the Monitoring Protocol to assess all four seasons, with rigorous randomized protocol for all four; coastal and inland aerial counts, with some conducted during poor weather conditions, to see how far inland the birds fly.
- The NHA fails to address fall staging and wintering waterfowl. He testified that his organization has counted over 22,000 waterfowl between the Niagara River and Port Dover.
 - The NHA fails to address cumulative impacts, either within the Project area, or between this Project and other projects. No thresholds were identified on which to base recommendations for the siting of individual turbines.

[42] In Dr. Petrie’s opinion, the Project approval and turbine siting should be based on the precautionary principle, especially since not enough is known about the impact of turbines on the species. He pointed to European studies, which show that wind turbines have a negative impact on bird abundance.

[43] When asked whether the Project will cause serious harm to waterfowl, Dr. Petrie answered that he has concerns with the number of projects and overall cumulative

impact, especially because no, or inadequate, research was done. He could not say whether the Project will have a continental impact on bird populations, although he has concerns, especially over the long term, and for species at risk.

Approval Holder's Evidence

[44] Anthony Zlahtic is the Director of Commercial Services with Capital Power and testified as to the development of the Project. Mr. Zlahtic stated that 60 turbine locations are permitted under the REA, but Capital Power intends to build 58 of 1.8 MW capacity each, of which thirteen are in Norfolk County and 45 in Haldimand County. Vestas model V90-1.8 MW wind turbines are proposed for this Project, which are 95 m high, and have blades that are 44 m long.

[45] Regarding the location of wind turbines with respect to natural heritage features, Mr. Zlahtic explained how construction of the access roads is designed to minimally impact sensitive areas such as wetlands, which have been considered through the NHA. He reviewed the discussions that took place with Norfolk County regarding the collector system along East Quarter Line, which runs very close to a wetland. He noted that the REA also approved an alternate route to avoid East Quarter Line, where the collector line runs east of the wetland.

[46] Nicole Kopysh is an ecologist employed by Stantec Consulting Limited, but the Approval Holder did not request that she be qualified to give opinion evidence. She managed the NHA/EIS for the Approval Holder, and supervised the preparation of the documents required for the REA's environmental approvals.

[47] Ms. Kopysh stated that the EEMP provides details on post-construction mortality monitoring of birds and bats and for monitoring disturbance effects on woodland breeding birds and amphibians. She noted that the EEMP was also updated to comply with the MNR's *Bird and Bird Habitat Guidelines* (the "*Bird Guideline*"), released in December 2011. An addendum to the NHA/EIS was submitted on April 2011 in response to a request by the MNR to provide details on a post-construction monitoring program with respect to the effects of disturbance on bald eagles.

[48] Ms. Kopysh directed the field program and conducted the public and agency consultations, although she stated that she did not take part in the wildlife habitat assessment. She testified that Stantec consulted with Environment Canada and the MNR on the work plan and methodologies used. She stated that the development of the EIS and EEMP was an iterative process with the MNR, and that both were approved by the MNR as meeting its requirements. She also indicated that the renewable energy approval regime uses a habitat-based approach to protection.

[49] Ms. Kopysh described the four steps for identification and evaluation of natural heritage features, as required by the Regulation: (i) conduct a records review for natural heritage features; (ii) do a site investigation to confirm those features or identify new ones; (iii) evaluate the significance of the natural heritage features identified, in accordance with the MNR's Natural Heritage Reference Manual ("NHRM"), and the Significant Wildlife Habitat Technical Guide ("SWH Technical Guide"); and (iv) prepare the EIS, which identifies mitigation if the Project is sited within 120 m of significant wildlife habitat ("SWH").

[50] With respect to the records review, Ms. Kopysh testified that the Regulation specifies organizations that must be contacted. She stated that Stantec exceeded the regulatory requirements because it consulted all four required bodies, as well as additional bodies for information, including the Important Bird Area ("IBA") database, the Ontario Breeding Bird Atlas, Ontario Birding Listserve, and public open houses.

[51] Ms. Kopysh testified that Stantec did not find tundra swan SWH, either through the records review or the site visit. As a result there was no requirement under the Regulation for a species survey. However, in response to information received from the public at the December 2009 open house, Stantec did an additional tundra swan survey in March 2010. Stantec's conclusion from that survey was that there was some use of the general study area by tundra swans, but in small and variable numbers. Ms. Kopysh testified that Long Point has significant staging habitat, but the swans in the vicinity of the Project area are present in smaller numbers than at Long Point.

[52] Ms. Kopysh noted that potential candidate SWH for tundra swans was identified in the Project area during the first phase review. Section 2.2.5.1 of the NHA/EIS, under "Seasonal Concentration Areas", states:

The Project Study Area has the potential to support Tundra Swans during their spring migration, as they roost offshore in Lake Erie, and forage inland on grain in agricultural fields. In past years, large numbers of Tundra Swan have been reported to stage east of Port Dover, in fields on either side of Quarter Line, and in a pond located in the northern end of the Project Study Area at Concession 6 Walpole and Sandusk Road (pers. Communications at Public open House, December 16, 2009).

[53] Stantec undertook the second phase review (i.e., the site investigation), and determined the "potential candidate" SWH for tundra swans should not be considered "candidate" SWH. Section 3.1.4.2 of the NHA details the "Spring Migrant Tundra Swan Surveys". Section 3.2.5.1 describes the results for the tundra swan staging, as:

Local observations indicate that select locations within the Project Study Area have supported staging swans in good numbers in the past,

however targeted surveys for Tundra Swan staging conducted in 2009 and 2010 indicated the Project Study Area is not regularly used for Tundra Swan staging. Only small numbers were observed and the site is not considered candidate significant wildlife habitat for Tundra Swan staging or foraging.

[54] Ms. Kopysh testified that sheet water/flooded fields are important to tundra swan habitat. During the tundra swan surveys they mapped these, but she testified that the results were that none were found in or within 120 m of Project components. Given that the Project area was found not to contain candidate SWH for the tundra swan because no sheet water was found, no environmental impact study was conducted with respect to that species, and no mitigation required.

[55] Ms. Kopysh also testified that no SWH for turkey vultures was found in the Project area either, as noted at s. 3.2.5.1 of the NHA, under “Staging Fall Raptors”:

The results of the Site investigations indicated that raptors migrate over the Project Location during fall migration. The individuals observed were not using habitat in or within 120 m of the Project Location for staging during migration, and the majority of movement occurred more than 125 metres above the Project Study area; they are not expected to rely on the habitat in the Project Study Area for migration. As a result, no candidate significant wildlife habitat in the form of staging areas for migrating raptors was identified in or within 120 m of the Project Location.

[56] Ms. Kopysh testified that no part of the Project is within a provincially significant wetland, and the only potential direct effect on natural features from the Project is habitat loss. She testified that habitat loss is avoided here through the siting of the Project. Indirect impacts during construction can include sedimentation, erosion and the chance of spills. However, she concluded that this Project is outside of natural features, further noting that construction activities are considered short-term, and are not expected to significantly impact the function of adjacent natural features.

[57] Ms. Kopysh testified that, from existing data for operating facilities, bird mortality from the Project is expected to be low. The monitoring results are submitted to the MNR annually, unless there is a species-at-risk (“SAR”) fatality, or the number of birds or bats that die from collisions exceeds the mortality thresholds set out in the *Bird Guideline*. In either of those cases, the results are reported to the MNR immediately. She asserts that the larger concern is in respect of effects on habitat, which are generally avoided through the siting of the Project, e.g. siting the Project in agricultural fields to avoid habitat fragmentation.

[58] Ms. Kopysh testified that Mr. Slaman’s videos and photos of tundra swans are very reflective of Stantec’s characterization of the study area, and that all species in the

photos are ones they recorded. Stantec's basic conclusion was that agricultural fields may be used by tundra swans, but in relatively smaller numbers than at staging areas such as Long Point.

[59] With respect to the timing window for tundra swan counts, Ms. Kopysh testified that Stantec followed Environment Canada's guideline, which is that tundra swans are present at the end of March or early April, with the peak at the end of March. She also testified that Environment Canada outlines a standard method for surveys, and that, on March 16, 2010, she had a telephone conversation with a representative from Environment Canada to confirm this. Ms. Kopysh also stated the IBA website shows the peak period for tundra swans is the end of March, and Birds of Ontario information states they arrive at the Lake Erie shores in early March, stay until early April, and that most are present in mid-March. She also testified that Stantec consulted Dr. Petrie's work, which stated that the tundra swans were present through to early April.

[60] Ms. Kopysh testified that two field surveys were completed for tundra swans; in March 2009 in the smaller proposed project area (formerly Tribute Resources' project of 10 turbines) over three days, and in 2010, involving a larger area, over three days. In November 2009, Capital Power bought the Project and expanded the study area. At the December 2009 public open house, local residents raised concerns about the tundra swans and as a result, an additional year of surveys took place in March 2010. She testified that tundra swan surveys include both a survey for foraging, and another for movement. She testified that Stantec followed standard survey methods developed in consultation with Environment Canada. Given that tundra swans are large birds, she stated that a terrestrial foraging survey is a suitable method.

[61] Ms. Kopysh acknowledged that the Stantec employee who conducted the bird field survey in 2010 drove along the shoreline and would have viewed the birds at points where they were visible from the road. She testified that this was a standard survey methodology.

[62] Ms. Kopysh stated that the number of swans present is variable from year to year. As to whether the count should have been conducted over a longer period, she indicated that the guidance documents state the number of seasons required. Ms. Kopysh declined to offer an opinion on the sufficiency of the work performed, from a biological point of view. She agreed that Stantec did not consult local residents with regards to the timing window.

[63] At the time of Stantec's bird surveys (2009 and 2010), MNR's *Bird Guideline* (dated 2011) was not yet available. As a result, Ms. Kopysh testified that Stantec

followed the Environment Canada 2007 *Recommended Protocols for Monitoring Impacts of Wind Turbines on Birds* (“*Federal Monitoring Protocol*”), and Environment Canada *Wind Turbines and Birds: A Guidance Document for Environmental Assessment*, dated February 2007 (“*Environment Canada EA Guide*”).

[64] With respect to the qualifications of the individuals who conducted the bird counts, Ms. Kopysh testified they are all qualified, based on what Stantec considers to be the appropriate level of qualification. She stated that there are no certification standards in effect.

[65] Ms. Kopysh acknowledged that the Port Rowan Office of Bird Studies Canada had been consulted only five days prior to the comments being sent to the MNR. However, she maintained that this was not required under the Regulation, and Stantec did more than what was required under the Regulation.

[66] With respect to aerial waterfowl surveys as recommended by Dr. Petrie in his evidence, Ms. Kopysh stated that none were done here because Stantec was assessing terrestrial land use, for which aerial surveys are not considered to be necessary. As all the turbines are sited inland on agricultural fields, she stated that the driving survey method which they followed is an accepted method for waterfowl use of agricultural fields. Ms. Kopysh testified that the Stantec surveyors had unobstructed visibility of lands on which the turbines are to be constructed. The goal of the survey, she stated, was to assess the terrestrial lands on which the turbines will actually be sited; not to get an accurate count of the abundance of tundra swans using the Project area. She noted that movement surveys and foraging surveys are to assist in capturing that.

[67] Ms. Kopysh acknowledged that the flight height for tundra swans is 25-80 m, which is turbine blade height.

[68] Ms. Kopysh noted that the MNR’s post-construction survey requirements will take place for the first three years from May 1 to October 31 only, and to the end of November for raptors. She explained that the timing window is based on observed conditions to date.

[69] In response to a question by HWC with respect to wild turkeys, Ms. Kopysh noted that wild turkey overwintering habitat would have been identified and assessed by Stantec, by looking at the habitat on site, and comparing it with the description of habitats in the SWH Technical Guide (e.g. woodlands with seeps or springs). She stated that such habitats were not found.

[70] With respect to winter deer yards, Ms. Kopysh testified that the MNR identifies those habitat areas, and Stantec obtained this information from them. There were no identified deer yards within the Project area.

[71] Steven Pelletier, Stantec's Principal Biologist who resides in Maine, USA, was called as an expert witness on behalf of Capital Power. Mr. Pelletier was qualified on consent of the parties to give expert opinion evidence as "a wildlife biologist with expertise on the impacts of wind turbines on avian species and wildlife." He agreed that he is not an expert on migratory waterfowl.

[72] Mr. Pelletier testified that, while there will be some mortality of resident and migratory species of birds as a result of this Project, he does not believe it will rise to the level of serious and irreversible harm to bird populations. Mr. Pelletier stated that bird mortality as a result of wind energy must be considered in the context of a broader perspective, and that it pales in comparison to other causes of mortality, such as collisions with buildings and predation by domestic cats. His witness statement notes that wind turbine mortality is estimated to contribute less than 0.01% of the annual estimated anthropogenic avian mortality. He testified that studies show that wind projects, when compared to other forms of energy production, are the least harmful to wildlife, including birds.

[73] Mr. Pelletier's witness statement at para. 40 explains the basis for his opinion that wind turbines do not pose a significant risk for turkey vultures:

As previously noted, six Ontario wind farms conducted post-construction mortality searches from 2006 to 2010. Despite their common occurrence and regular, low level flight behaviour, only six turkey vultures were documented to have been killed in Ontario during that time period (Appendix 1; Tables 2 and 6). A total of eight turkey vultures were documented to have been killed to date in the US between 1994 to 2010; a total of 14 including APWRA (Table 1).

[74] He noted that turkey vultures tend to hunt when there are thermals created by ground temperature warming, between 10am and 4pm. They are able to see the turbines and avoid them.

[75] Regarding tundra swans, Mr. Pelletier believes that the turbines do not pose a significant risk for them. Mr. Pelletier testified that there are no known cases where tundra swans have been killed due to collision with a wind turbine. Mr. Pelletier referred to fieldwork reports authored by James D. Ross with respect to the Erie Shores Wind Farm in Port Burwell, Ontario, which showed that tundra swans were using the area as they did prior to construction, both during and after construction of wind turbines, and that they were adept at avoiding active wind turbines. Over 1,000 tundra swans were

observed, and foraging behaviour was observed within “a couple of hundred metres” of turbines. He believes that both tundra swans and turkey vultures will adapt to the presence of wind turbines.

[76] Mr. Pelletier has no concern about the proximity of the Project to the Long Point IBA, which is approximately 18-25 km from the Site. He testified that both turkey vultures and tundra swans are adept at recognizing the danger posed by the turbines, and avoiding it. He stated that, while every piece of property has some habitat value, the task is to focus on those that are particularly critical. While much of Lake Erie shoreline is agricultural, he stated, the birds will concentrate where it is most consistently good habitat.

[77] Mr. Pelletier disagreed with Dr. Petrie’s recommendation that a fly-over count be undertaken for waterfowl, because there is a difference between the requirements for an academic study or regional study by the province, *versus* a study done on a particular site for a particular reason. He agreed that, for a large study area, aerial surveys are an excellent tool. However, for a smaller area such as this Project study area, he expressed his view that a pair of binoculars is sufficient. In a similar vein, Mr. Pelletier testified that an assessment of a project area is different from a scientific research project.

[78] Although the risk to individual species is low, Mr. Pelletier agreed that the cumulative effect of all the proposed projects along the Lake Erie shoreline “bears monitoring”. The basis for post-construction monitoring, he stated, is to understand if there is a significant level of mortality. He stated that the May 1 – October 31 monitoring required in Ontario may be appropriate to broaden, as more is learned over time. He also noted that it is important that post-construction monitoring use the same methods and metrics as researchers.

Director’s evidence

[79] The Director called Heather Riddell with respect to the REA application process. Ms. Riddell is a renewable energy planning ecologist with the MNR, but the Director did not request that she be qualified as an expert to give opinion evidence. She has reviewed various wind projects, and was involved in Capital Power’s application at the stage of reviewing Stantec’s addendum reports (Dec 23, 2011 and July 23, 2012).

[80] Ms. Riddell noted that the most current document available to identify candidate SWH is the Draft Eco-Region 7E Criteria Schedule (February 2012), although it was not available when the MNR reviewed Capital Power’s REA application. The prior draft

Eco-Region guidance was dated January 2009. She testified that Stantec would have used the SWH Technical Guide, published in October 2000.

[81] Ms. Riddell echoed Ms. Kopysh's testimony, that the regulatory regime requires applicants to look for habitat, rather than the presence of species. Once candidate habitat (described in the Technical Guide Appendix K for waterfowl) is found in or within 120 m of the project, an applicant must conduct an evaluation of significance. That evaluation involves surveys for abundance and for species using that habitat.

[82] Appendix Q of the SWH Technical Guide provides guidance on how many individuals of a species must be found in order for a "seasonal concentration habitat" to qualify as SWH, although the Guide does not include precise numbers. Ms. Riddell testified that the SWH Technical Guide takes a landscape approach, identifying habitat that should be considered significant on a landscape scale. The relevant excerpt from the SWH Technical Guide Appendix Q for the tundra swan, table Q-1, under "Waterfowl stopover and staging areas", is attached to this Decision as Appendix C.

[83] Ms. Riddell testified that candidate SWH for tundra swans is listed in the most recent MNR guidance as being "wetlands in conjunction with Long Point". Thus, wetlands near that known location will be considered significant. Ms. Riddell testified that agricultural fields could be considered SWH, but only in those areas listed in the Appendix; i.e., those within the vicinity of Long Point. Agricultural fields that are outside that area are not considered SWH, unless the fields flood during spring melt and runoff (presence of "sheet water"). In that case, they can be considered "candidate" SWH. Where a field is not flooded, it is not candidate.

[84] Where a "non-candidate" field is flooded, the proponent must conduct surveys to determine "the number or diversity of species using the habitat". That was not done in this case, because Stantec did not identify sheet water in the Project area.

[85] Ms. Riddell referred to the guidance provided in the MNR's draft "Criteria for Significant Wildlife Habitat in Eco-region 7E", which lists in Table 1.1 "Seasonal Concentration of Areas of Animals", that candidate SWH can be "Fields with sheet water or fields utilized by Tundra Swans during Spring (mid-March to May)." She noted that the surveys in this case were done within that time frame. The relevant excerpts from the Eco-region 7E Criterion Schedule, Table 1.1 under "Seasonal Concentration Areas of Animals", from both the 2009 and 2012 drafts, are attached as Appendix D.

[86] Ms. Riddell agreed with Mr. Slaman that the Eco-region criteria note that the local population should be consulted about the presence of species. Ms. Riddell noted, however, that the MNR reviews only the NHA/EIS. In considering the EIS, the MNR will

consider whether the mitigation measures ensure that the size and composition of the habitat will be able to function. For guidance on acceptable mitigation, section 7.2.2.1 of the NHA Guide includes recommendations for mitigation, such as buffers and fencing.

[87] With respect to turkey vultures, Ms. Riddell testified that the SWH Technical Guide includes “seasonal concentrations” as candidate SWH under both s. 4.4.10 (turkey vulture summer roosting areas) and 4.4.7 (landbird migratory stopover area).

[88] She noted that turkey vulture summer roosting areas are not in the schedules, because they are not generally well known by the MNR. It was thought they were attracted by farm scraps, creating artificial habitats. She noted, however, that, as the Technical Guide refers to turkey vultures, their summer roosting areas can still be considered as habitat. However, the MNR has no data for that habitat type on what constitutes seasonal concentrations.

[89] Ms. Riddell testified that, if SWH were present, the MNR would be very specific about the types of pre-construction surveys that should take place. For example, the MNR might ask for a pre-construction baseline survey, to determine the habitat and its use, so that post-construction use could be compared.

[90] Ms. Riddell testified that the MNR maps winter deer yards at the District level. If they are not mapped in a Project area, there is no further requirement for a proponent to assess. She also confirmed that a species-at-risk report is separate from the REA, and is used to determine whether a permit under the *Endangered Species Act, 2007* (“ESA”) is required.

[91] The Director also called Fiona McGuiness, who was qualified as a biologist with expertise on the impact of wind turbines on birds. Ms. McGuiness is an MNR employee who co-led the writing team for the original draft guidelines in 2007. She stated that the MNR team relied heavily on the federal guidance by Environment Canada, noting that Environment Canada has jurisdiction for migratory birds under the *Migratory Birds Convention Act*. According to Ms. McGuiness, Environment Canada tracks and monitors migratory bird species. Ontario has jurisdiction under the *Fish and Wildlife Conservation Act, 1997* for raptors and a few other bird types, with respect to protection of habitat. She testified that, due to the *Green Energy Act, 2009* and the Regulation, the MNR revisited the *Bird Guideline* and updated it. It was posted on the Environmental Registry in 2010, and finalized in 2011.

[92] Ms. McGuiness testified that, in drafting the *Bird Guideline*, the MNR conducted consultations including with Bird Studies Canada (“BSC”). BSC manages the “Wind

Energy Bird and Bat Monitoring Database” (the “Database”). Long Point Waterfowl, Dr. Petrie’s research organization, is under the parent organization BSC.

[93] Ms. McGuinness describes the Database in her witness statement:

4. I am a steering committee representative to the Wind Energy Bird and Bat Monitoring Database partnership, a research monitoring initiative that tracks and reports monitoring information from wind power projects related to birds and bats. Database partners include Bird Studies Canada, Canadian Wind Energy Association, Environment Canada-Canada Wildlife Service and Ontario Ministry of Natural Resources.

...

32. Post-construction monitoring data collected at wind power projects in Ontario is entered into the Wind Energy Bird and Bat Monitoring Database, maintained by Bird Studies Canada. This database was collaboratively established by MNR, Bird Studies Canada, the Canadian Wind Energy Association, and Environment Canada – Canadian Wildlife Service to track bird and bat information at wind power projects across Canada. The intent of this database is to develop an improved understanding of bird and bat mortality risks and patterns associate with wind power project that can be used to update Guidelines and inform mitigation as necessary. In Ontario, wind power project bird and bat monitoring data and reports must satisfy the data standards and requirements of this database.

[94] Ms. McGuinness notes that “to date, there has been no recorded tundra swan mortality at any Ontario or Canadian wind power project.” Ms. McGuinness testified that, according to the research she has done, pre-construction bird activity monitoring is not successful in predicting post-construction mortality. Rather, site-specific factors are more critical than bird activity.

[95] Ms. McGuinness testified that the Database includes some information that was collected year-round. Ms. McGuinness referred to an article published in *Ontario Birds* in December, 2011 authored by Lyle E. Friesen, which states that there is no evidence of large-scale fatality events at Ontario wind power projects, and further notes that the Erie Shores wind project conducted 52-week mortality monitoring over two years, and found no tundra swan deaths. Ms. McGuinness also referred to European studies which involved radar monitoring, and show that geese avoided offshore wind farms.

[96] With respect to turkey vultures, Ms. McGuinness testified that their population in Ontario numbers in the hundreds of thousands, and is “abundant and stable”. In Ontario, turkey vultures make up less than 3% of all bird deaths reported due to collision mortality.

[97] She testified that Environment Canada has very good records of migratory birds. She further indicated that, a document entitled “*State of Canada’s Birds 2012*”,

published by the North American Bird Conservation Initiative (Environment Canada), notes that waterfowl populations have been increasing in Canada, including the Lower Great Lakes – St. Lawrence area.

[98] Overall, Ms. McGuinness testified that potential and predicted mortality numbers, for existing and predicted projects, applying the highest mortality rates, the population level effects, and even considering cumulative effects, will not create a sustainability concern. Absolute mortality numbers are low compared to actual bird abundances, and they are distributed across multiple species. She testified that, at the mortality threshold of 14 mortalities /turbine /year, there is no concern for sustainability. She noted the mortality monitoring threshold was adopted as a precautionary approach. If the number of mortalities at any particular turbine exceeds this threshold, this will trigger scoped monitoring to determine why the elevated numbers of collisions are occurring. She noted that the separate mortality threshold related to raptors (0.2 /turbine /year) is due to the fact that it is a smaller group, concern arising out of experience at Altamont Pass in California, and the fact that Ontario has jurisdiction over raptors.

[99] Ms. McGuinness testified that indirect effects in the *Bird Guideline* include habitat disturbance and avoidance. Section 1.1 of the *Bird Guideline* focuses on habitat. Ms. McGuinness acknowledges that some key knowledge gaps remain, noting that this is addressed at the project-specific level, by post-construction monitoring of significant wildlife habitats.

[100] With respect to the fact that a May 1 to October 31 monitoring year does not capture tundra swan mortalities which may occur during spring migration, Ms. McGuinness explained that this monitoring period is when most turbine-related bird mortality occurs in Ontario. She also stated that the monitoring period was determined through consultation with Environment Canada, and that it is consistent with their approach.

[101] Ms. McGuinness testified that Ontario's requirement for three years of post-construction monitoring is lengthy, to account for year-to-year variability. She stated that it is the highest compared to other jurisdictions. She noted that the federal post-construction monitoring requirement is site-specific, and can require "two or more" years of monitoring. Ontario, however, requires three years at all projects, with additional scoped monitoring if the mortality threshold is exceeded.

[102] Ms. McGuinness testified that the regulatory approval process allows the government to predict cumulative effects. She also stated that the MNR is looking at cumulative effects through information provided to the Database. She explained that

the intent of the Database is to enable a study of cumulative effects across the landscape, noting that broader information from multiple projects is required to understand what the cumulative effects will be. She expressed her opinion that, based on Environment Canada information and extrapolating current mortality numbers into the future, there will be no serious and irreversible harm to bird populations, as the result of cumulative effects of wind turbine operations.

[103] In cross examination by Mr. Slaman, Ms. McGuiness testified that “habitat” is widespread; the significance of the habitat is determined through the SWH Technical Guide. She stated it is “typically based on the numbers of animals seen.”

[104] When asked who determines the number of birds necessary to make that decision, Ms. McGuiness testified that the MNR puts together the criteria after consultation with wildlife biologists and specialists. Ms. McGuiness stated that the Ecoregion 7E criteria were developed by MNR wildlife biologists and science staff, in whom she has confidence.

[105] Ms. McGuiness testified that, if they saw bird population changes due to wind turbine operations, it would likely require changes to the *Bird Guideline*.

Discussion, Analysis and Findings

[106] Under s. 145.2.1(2) and (3) of the *EPA*, the onus rests on the Appellants to establish that engaging in the renewable energy project in accordance with the renewable energy approval will cause serious and irreversible harm to plant life, animal life or the natural environment.

[107] The Tribunal adopts the finding in *Erickson v. Director (Ministry of the Environment)*, [2011] O.E.R.T.D. No. 29 that the evidence must meet the civil standard of proof, in that “will cause” should be proven to the standard of “more likely than not”.

[108] Although Mr. Slaman asserts that the Project will cause serious harm to plant life, animal life or the natural environment in general, he bases his appeal on the impact of the Project on two species: tundra swans and turkey vultures. In summary, the grounds of his appeal are that two types of harm will be caused by engaging in the Project in accordance with the REA. The first is that both tundra swans and turkey vultures will be killed by colliding with individual wind turbines. The second is that wind turbines will interfere with tundra swan feeding habitat, thereby depriving tundra swans of the food they require to successfully complete their northern spring migration and reproduction cycle. He asserts that wind turbines cause this interference, as he maintains that it is the natural behaviour of tundra swans to avoid industrial wind

turbines. He argues that tundra swans will, therefore, avoid agricultural fields where wind turbines are located. Because tundra swans rely on residual grains found in agricultural fields as an important source of food, he maintains that wind turbines will cause the loss of this foraging habitat.

[109] The Tribunal notes that Mr. Slaman's submissions are inter-connected. It is not disputed that the north shore of Lake Erie is a staging area, i.e., where the swans will roost during their migration stopover period and fly inland daily to forage for food, returning to their roosting area before nightfall. Consequently, wind turbines that are located between such roosting areas and foraging fields may increase the potential that the birds could collide with wind turbines.

[110] Mr. Slaman's submission regarding loss of foraging habitat raises a number of corollary issues respecting the surveys and analysis conducted by the Approval Holder as required under the Regulation:

- Do agricultural fields used by tundra swans for foraging qualify as SWH under the NHA Guide? If so, the *Bird Guideline* stipulates that wind turbines can only be located in or within 120 m of Project components in such fields with MNR approval, upon completion of an EIS that is conducted in accordance with procedures established by the MNR's Natural Heritage Assessment Guide. The *Bird Guideline* further requires that this study must describe:
 - any negative environmental effects of the project to bird SWH;
 - mitigation measures for any negative environmental effects to bird SWH; and
 - how the construction plan report and the EEMP address any negative environmental effects to bird SWH.
- Because the definition of SWH includes, as one criterion, the number of birds using an area as habitat, did the bird count surveys conducted on behalf of the Approval Holder err by significantly under-estimating the number of tundra swans that forage in the Project area during their migration stopover?
- Has adequate consideration been given to the potential cumulative impact on tundra swan use of foraging habitat resulting from the number of industrial wind turbine projects being constructed along the shores of Lake Erie? In this regard, is there adequate data regarding "stop over" counts (i.e., surveys to estimate the current abundance of migrating tundra swans that forage within the agricultural fields within the Project Area)? Are there adequate monitoring protocols in place to enable regulatory authorities to identify whether future

bird abundance and foraging habitat use will be altered as a result of the introduction of multiple wind projects along the northern shore of Lake Erie?

[111] In addressing the grounds of Mr. Slaman's appeal, the Tribunal first notes that the test the Appellants must satisfy under s. 145.2.1(2) of the *EPA* is not whether there are inadequacies in the surveys and assessments submitted by the Approval Holder in support of its application for the REA. The test is whether engaging in the Project in accordance with the REA will result in serious and irreversible harm. However, inadequacies in surveys and assessments may be a relevant consideration in evaluating whether the test has been met.

Issue 2a. Whether serious and irreversible harm will be caused to tundra swans and turkey vultures through collision mortality

[112] The Tribunal turns first to the issue of collision mortality respecting turkey vultures. Mr. Slaman provided evidence of his personal observations of turkey vultures near his home, which is located in the vicinity of the Project Area. Mr. Slaman relies on this evidence to support his assertion that the bird surveys conducted on behalf of the Approval Holder significantly underestimate the number of turkey vultures in the Project area.

[113] For purposes of its analysis, the Tribunal accepts that turkey vultures are present in significant numbers, as Ms. McGuiness confirmed that they are abundant in the province (numbering in the hundreds of thousands) and are a stable population. Dr. Petrie did not testify regarding turkey vultures. Mr. Slaman asserts that common sense dictates that collision mortalities will occur, based on his assertion that turkey vultures will fly at the same height as wind turbine blades. Ms. McGuiness confirmed that such mortalities do occur; however, she also indicated that available data shows that turkey vultures make up less than 3% of all bird deaths reported due to collision mortality in Ontario. Ms. McGuiness testified that scientific studies have shown that pre-construction bird activity does not accurately predict post-construction collision mortality. She noted that other factors, such as presence of significant habitat, are better indicators. Ms. McGuiness was confident that this mortality rate does not present a concern for sustaining the turkey vulture population, from this Project or cumulatively with all projects likely to take place in the next 10 years.

[114] Turkey vultures are considered raptors, and therefore are covered by the mortality threshold of 0.2 raptors/turbine/year across a wind power project. The MNR specifically made this point in their comments on the EEMP draft, s. 3.1.1 "Mortality Monitoring: Birds".

[115] Mr. Pelletier was also confident that the Project will pose no threat to turkey vulture populations in Ontario, as noted above, based on the results of studies and monitoring that has occurred to date for other wind projects.

[116] Aside from raising concerns, Mr. Slaman adduced no evidence to counter Ms. McGuinness' and Mr. Pelletier's testimony. Given that the only evidence before it, which is undisputed, is that turkey vulture collision mortality is very low, the Tribunal finds that Mr. Slaman has failed to establish that engaging in the Project in accordance with the REA will result in serious and irreversible harm to turkey vultures due to collision mortality.

[117] The Tribunal now turns to the issue of collision mortality respecting tundra swans.

[118] Mr. Slaman argues that it is common sense that, given the number of tundra swans that use the Project area, many will be killed by collisions with the turbines. Ms. Kopysh agrees with him that tundra swans fly at turbine height in this area. Mr. Slaman points out that, where tundra swans are at migrating altitude, they would fly above the turbines. This may explain, he argues, why no fatalities have been found from turbine projects elsewhere. However, the behaviour of this species (feeding inland in the agricultural fields and flying to the shore to roost overnight) makes them vulnerable to collision mortality in this particular area.

[119] Mr. Slaman's concern, that negative effects from wind turbines on tundra swans and their habitat may have been occurring but not recorded, appears to be reflected in the following statement from the August 2012 "Summary of the findings from post-construction monitoring reports", published by the Bird and Bat Monitoring Database and referred to in the witness statement of Ms. McGuinness. It notes that availability of mortality information is limited outside the required monitoring period (at p.4):

The database currently contains monitoring data from surveys conducted in all months of the year; however, the majority of mortality monitoring at wind installations occurred between the months of May and October. This reflects bird and bat monitoring protocols from provincial and federal regulators that recommend surveys be run from May 1st to October 31st thus covering the main periods of activity of birds and bats, particularly during migration. Many wind installation projects did not undergo monitoring outside of these recommended periods and therefore the available information on mortality in this time frame is limited by the few sites that performed monitoring throughout the year.

[120] Thus reports of bird mortality in March, when migrating tundra swans are present in Southern Ontario, is limited.

[121] Mr. Slaman's concern that this Project may cause a relatively high rate of collision mortality for tundra swans due to its siting on the north shore of Lake Erie, in a migration staging area, finds some support in the scientific literature filed. *Wind Turbines and Birds: Background Review for Environmental Assessment* (April 2, 2007, CWS/Environment Canada), at s. 3.2 (pp. 19-21), emphasizes the risk of "bird-turbine interaction" in migration routes where large numbers of birds are using restricted corridors:

Landform features can increase the potential risk to migrating birds. Besides concentrating diurnal migrants, topography can increase the likelihood of bird-turbine interaction. ...

Diurnal migrants are more constrained by topographical features than are nocturnal migrants. Birds tend to concentrate along linear topographic features such as coastlines, rivers, ridges, valleys and peninsulas (Richardson 2000). ... The greatest concentration of birds often occurs at these features when there is a crosswind relative to that feature (Richardson 2000). ...

Staging areas

When birds migrating over land or water encounter a coastline, they often turn along that coastline and form a concentrated stream of migration along the coast...

At staging areas, flights of large number of migrants are often concentrated into corridors when the birds are either taking off or approaching to land (Richardson 2000). The flight height of these migrants is often at the height of wind turbines and the distance from the stopover area within which flight altitudes will be low enough to be at risk of collisions with turbines will depend on the type of bird and other factors. **Some birds, like swans, typically climb only very gradually, and may remain low for a considerable distance after takeoff from the stopover area.** (emphasis added)

[122] Dr. Petrie explained that the north shoreline of Lake Erie is a main migration staging area for the tundra swan EP which consists of approximately 80,000 to 100,000 birds. Tundra swan populations have doubled in southern Ontario in the last 40 years. When discussing habitat displacement, Dr. Petrie indicated that there are sizeable populations of waterfowl, and that a few collision mortalities would not be overly concerning. He also indicated, in the context of discussing cumulative impact, that he would be concerned about collision mortality once the maximum number of wind turbines was installed in Canada and the United States.

[123] Ms. McGuinness referred to a European Study respecting pink-footed geese. During this four-year study, bird detection radar was used to monitor behavioural responses and flight changes of migrating pink-footed geese in relation to two offshore wind farms during and after construction. She noted that, in summary, 97.25% of all

flocks recorded by radar in 2009 and 2012 combined migrated without any risk of additional mortality associated with the constructed wind farms.

[124] Mr. Pelletier testified that his review of the scientific data and literature indicates that there have been no reported collision mortalities for tundra swans in North America, or swans in general (excluding a single mortality reported in China). He stated that he anticipated no collision mortalities for tundra swans as result of the Project. While he would not assert that there would be zero mortalities for swans as a result of engaging in this Project, in his view the risk is nonetheless very low. He referred to a study conducted at the Erie Shores wind facility which showed that tundra swans continued to use agricultural fields for foraging even after turbines were built in the fields, as they had pre-construction, and that they were adept at avoiding collisions.

[125] The Tribunal finds that the preponderance of the evidence adduced in this case indicates that tundra swans have a robust population which is not shown to be significantly impacted by collisions with turbines at existing wind projects. There is no evidence to support a conclusion that this Project will cause collision mortality of tundra swans to a serious and irreversible level. Consequently, the Tribunal finds that Mr. Slaman has failed to establish that engaging in the Project in accordance with the REA will result in serious and irreversible harm to tundra swans due to collision mortality.

[126] The Tribunal is compelled to note that it nonetheless has outstanding concerns in this case as a result of the unique migration characteristics of the tundra swan, and the REA's restricted mortality monitoring window. The REA requires three years of post-construction collision mortality monitoring between May 1 and October 31 only, thus outside the period when tundra swans are present during spring migration. Tundra swan deaths, should there be any during the spring migration, will not be observed, and the species will therefore not benefit from the mortality thresholds outlined in the *Bird Guideline*. Conditions related to pre- and post-construction monitoring, and to "reporting and review of results", are reproduced in Appendix B to this decision.

[127] This concern is supported by references in Ontario's *Bird Guideline* regarding the importance of carcass searches and mortality monitoring, whether or not significant wildlife habitat is found on a project site.

[128] Environment Canada's Recommended Protocol also discusses the importance of post-construction follow-up studies, including carcass searches:

...as a **minimum standard**, 6 to 8 weeks of carcass searches **during the spring migration period** and 8 to 10 weeks during the fall migration period should be planned for. (at p. 11) (emphasis added)

[129] Appendix 1 to that document, “Details of Selected Sampling Protocols”, explains under “carcass searches” at p. 25 that:

the minimal duration of carcass searches for passage migrants would typically be 6 weeks during the spring migration period and 8 weeks during the fall migration period. The peak period of migration varies by region, but generally most spring migration is from early April to the end of May, while the fall season extends from early August to the middle of October. **Migration of waterfowl or some raptors may extend outside these seasons.** (emphasis added)

[130] All the expert witnesses agreed that knowledge gaps remain, with respect to wind turbine impacts on birds. Dr. Petrie expressed a clear need for further scientific study, and Mr. Pelletier suggested that it might be appropriate to broaden the collision monitoring requirements to include the months when tundra swans are present in southern Ontario. As a result, the Tribunal recommends that the REA requirements related to post-construction collision monitoring for birds be extended to include the time period when migrating tundra swans can be expected to be present in the Project area. Based on the evidence before the Tribunal, this currently would include the latter part of February, March and April.

Issue 2b. Whether serious and irreversible harm will be caused to animal life or the natural environment through loss of tundra swan or turkey vulture habitat.

[131] With respect to turkey vulture habitats, Ms. Kopysh described Stantec’s studies and conclusion that the Project area was not considered to be SWH in the form of staging areas for migrating raptors. The only issue raised by Mr. Slaman with respect to turkey vultures relates to the concern that their numbers were underestimated. The MNR agrees that turkey vultures are plentiful in this area. Mr. Slaman led no evidence with respect to the importance of the habitat in the Project area to turkey vultures, or any avoidance behaviour of this species. As a result, the Tribunal finds that there is no evidence to support a finding that the Project will cause any loss of habitat which would cause serious and irreversible harm to turkey vultures.

[132] The Tribunal now turns to the evidence relevant to Mr. Slaman’s submission that tundra swans will avoid areas around individual wind turbines. When a turbine is located in an agricultural field, the alleged harm that will be caused by this avoidance is that tundra swans will be deprived of access to field grains due to this displacement, thus resulting in a loss of feeding habitat. Mr. Slaman relies on concerns expressed by Dr. Petrie that multiple adjacent wind farm projects could result in a cumulative loss of foraging habitat, and that any resulting change in tundra swan and other waterfowl migration patterns is unknown.

[133] In terms of foraging behaviour, tundra swans have proven to be adaptable. Dr. Petrie notes that, since the 1960's, field feeding waterfowl, swans in particular, have become dependent upon cereal grain availability in agricultural fields, such as soybean and corn. He indicated that experts believe this is a learned behaviour. This change has resulted from the reduction of coastal wetlands, and an increase in agricultural use of land. Changes in farming practices incorporating no-till soil management have also increased the availability of field grain for waterfowl. Dr. Petrie indicated that migration patterns indicate that tundra swan maximize their time in agricultural grain areas to take advantage of this food source. Other changes in the environment have occurred. The introduction of zebra mussels in the Great Lakes now provides an additional food source for tundra swans. Warmer climatic conditions also result in less snow, thereby easing their access to food in agricultural fields.

[134] With respect to foraging behaviour, Dr. Petrie indicated that the staging area where the tundra swans rest is typically in Lake Erie along the shoreline. They fly inland twice per day to forage in agricultural fields during daylight hours. He indicated that one of his doctoral students has conducted an analysis of satellite tracking data of tundra swans, which indicates that they may travel as far as 45 km from their roosting location to forage, but the mean and median distance is between 8 and 10 km.

[135] Dr. Petrie testified that he is not an opponent of wind farms and he indicated that his purpose in testifying was to express concerns where wind farm development impinges or potentially impinges on waterfowl. Although Mr. Slaman's appeal is focussed on tundra swans, Dr. Petrie emphasized his concerns relate to all species of migratory waterfowl. He stated that the consultant for the Approval Holder did not access available data on waterfowl that overwinter along the Lake Erie shoreline, and did not study tundra swans' usage of land situated within the Project Area for foraging. He referred to studies conducted in Europe, in particular a Danish study which demonstrated that, once industrial wind turbines were constructed in fields traditionally used by Bewick's swans, their use of the area diminished to almost nothing. He noted that the displacement of birds from areas within and surrounding wind farms is due to visual intrusion and disturbance, and that it effectively amounts to habitat loss. He referred to one study's recommendation that wind farms should not be located near populations of birds of conservation importance, particularly Anseriformes (i.e. waterfowl such as ducks, geese, and swans).

[136] Dr. Petrie also discussed how far waterfowl may stay away from individual wind turbines. He referred to a research review paper entitled *Assessing the impacts of wind*

farms on birds, published online March 26, 2006 by A. Drewitt and R. Langston (the “Research Review Paper”), which states at p. 8:

Unfortunately, few studies of displacement due to disturbance are conclusive, often because of the lack of before-and-after and control-impact (BACI) assessments. Onshore, disturbance distances (in other words the distance from wind farms up to which birds are absent or less abundant than expected) up to 800 m (including zero) have been recorded for wintering waterfowl (Pedersen & Poulsen 1991), though 600 m is widely accepted as the maximum reliably recorded distance. The variability of displacement distances is illustrated by one study which found lower post-construction densities of feeding European White-fronted Geese *Anser albifrons* within 600 m of the turbines at a wind farm in Rheiderland, Germany (Kruckenberg & Jaene 1999), while another showed displacement of Pink-footed Geese *Anser brachyrhynchus* up to only 100–200 m from turbines at a wind farm in Denmark (Larsen & Madsen 2000).

[137] Dr. Petrie did not state conclusively that the tundra swans exhibit such avoidance behaviour.

[138] The above information prompted Nadine Harris, Counsel for the Director, to request Dr. Petrie’s views respecting the following assertion: Assuming an industrial wind turbine is constructed in a field used by waterfowl, waterfowl can still forage in adjacent agricultural fields, particularly if the turbine is situated in an area of Ontario where there are a significant number of agricultural fields. Dr. Petrie indicated that they could, and that he was only concerned when industrial wind turbines are placed in fields that are already being used by waterfowl. He added that he was not concerned about turbines that are placed in fields that might or might not be used, noting as well that he is only concerned with agricultural fields that are closely associated with the critically important staging areas.

[139] Dr. Petrie then indicated that he relied on the Danish recommendation that wind turbines should not be located near habitats closely associated with coastal wetlands or in migration flight corridors. He also observed that, if wind turbines were constructed in fields that are closely associated with staging habit, this would effectively remove these fields as foraging habitat, especially because these nearby fields are used by tundra swans during bad weather.

[140] Dr. Petrie further stated that, if only a few turbines were constructed along the north shore of Lake Erie, then he would certainly agree that all the other fields would be available for foraging. However, he asserted that, in the area from Port Dover to the Grand River, there are a lot of fields closely associated with wetlands that will have wind turbines. He also asserted that, although he could not state there would be major

cumulative effects, no one could state that there would not be. In response to a further question posed by Ms. Harris, Dr. Petrie agreed that he did not know what percentage of fields are being used for wind turbines for other wind farm projects in the area, but he noted that this information could be obtained.

[141] Dr. Petrie also expressed concern regarding the barrier effect of placing what he described as a gauntlet of wind turbines between the tundra swans' roosting and foraging areas. In this regard, the Tribunal notes that behavioural studies, recommended in the Environment Canada-Canadian Wildlife Service ("EC-CWS") guidance document for Monitoring Protocols, were not conducted in this case. Section 8.2 of the *Environment Canada EA Guide*, entitled "Additional information required to deal with particular factors of concern", requires a behavioural study to be undertaken. This is relevant to the Tribunal's analysis of Capital Power's EIS with respect to tundra swans. Section 8.2 notes:

(I)f large concentrations of birds occur nearby, either staging or on migration, then surveys should be undertaken to understand the behaviour of the birds, and whether they are likely to be put at risk by the turbines. Such studies need to be undertaken at the appropriate time of year when the bird concentrations are present. These studies should determine how many birds move through the proposed sites of the turbines (e.g., between breeding and feeding locations) and how frequently. Are the birds likely to fly through the site if they are disturbed? At what height are the birds moving through? How close are the proposed turbine sites to important feeding or staging locations, and are these likely to be disrupted by construction?

[142] Behavioural studies would appear to be relevant in the case of the tundra swan, which roosts on Lake Erie, and flies inland to agricultural fields to forage. An article entitled "*Poor evidence-base for assessment of windfarm impacts on birds*" published on-line February 14, 2007, by G. Stewart, A. Pullin, and C. Coles, notes, at p. 9, that "there is potential for long turbine strings to disrupt ecological links by displacing birds moving between feeding, breeding and roosting areas."

[143] Mr. Pelletier does not agree with Dr. Petrie's view. As noted earlier in this decision, he testified that he was not concerned that tundra swans would be displaced from the fields in which the Project is proposed. He referred to a study conducted at the Erie Shores development which indicates that tundra swans continued to use the area post-construction as they did pre-construction. He expressed his view that, even if displacement did occur as a result of the Project, the impact would not be serious and irreversible given that much of the Lake Erie north shoreline is comprised of similar agricultural fields. He noted that, for species that are more adaptable, there are more opportunities for them to find suitable foraging habitat.

Significant Wildlife Habitat

[144] Before turning to the ultimate question of whether this Project will cause serious and irreversible harm to plant life, animal life or the natural environment, the Tribunal will first address the preliminary question of how its analysis is impacted by Stantec's conclusions regarding SWH for tundra swans in the Project area.

[145] Under the Regulation, a proponent applying for a renewable energy approval is required to conduct an evaluation of the significance of each natural feature identified in the course of a records review and site investigation. In its NHA, Stantec reached two key conclusions in this regard, which were accepted by the MNR:

- the Project area is not regularly used for tundra swan staging; only small numbers of tundra swans were observed; and
- the site is not considered candidate significant wildlife habitat because no "sheet water" was identified.

[146] Where an area qualifies as SWH, s. 38 of the Regulation provides that construction of a project may occur in the SWH, or within 120 m of the boundary of such habitat, but only if the applicant submits an EIS report, prepared in accordance with any procedures established by MNR, that identifies and assesses any negative environmental effects of the project, as well as mitigation measures in respect of such negative environmental effects. The applicant is further required to prepare an EEMP that describes how it will address such effects. The applicant is also similarly required to describe how its construction plan report, which is also required under the Regulation, will address such effects.

[147] The MNR has issued a Guide to provide applicants with direction for conducting this evaluation, which is entitled *Natural Heritage Assessment Guide for Renewable Energy Projects, December 2010* ("the NHA Guide"). Section 5.5.1.2 of the NHA Guide, in turn provides that the significance of wildlife habitat is to be determined by using the criteria in MNR's *SWH Technical Guide*. The relevant appendices are Appendix K, regarding Significant waterfowl habitat, and Appendix Q, Evaluation Criteria for Seasonal Concentration Habitats, and in particular Table Q-1, "Waterfowl stopover and staging areas". Appendices K and Q to the *SWH Technical Guide* are attached as Appendix C to this Decision.

[148] In addition, a February 2009 draft of the document EcoRegion 7E Criteria Schedule to the *SWH Technical Guide* was available at the time this Project was being assessed. An updated draft of the EcoRegion 7E Criteria Schedule is dated January

2012. Table 1.1, Seasonal Concentration Areas of Animals and Waterfowl Stopover and Staging Areas (Terrestrial), is relevant to determining tundra swan SWH. The draft Ecoregion 7E Criteria Schedule, both for 2009 and 2012, are reproduced in Appendix D to this Decision.

[149] Ms. Kopysh testified that the agricultural fields in the Project area were not considered “candidate” SWH for tundra swans because there was no presence of sheetwater in these fields. However, the February 2009 guidance on this point notes the following under the column for habitat characteristics: “Fields with sheet water **or** fields utilized by Tundra Swans during Spring (March to May)”. (emphasis added)

[150] Under the “Confirmed SWH” column, the 2009 Draft Table 1.1 provides:

Studies carried out and verified presence of an annual concentration of any listed species:

- Aggregation of **100 or more** of any one of the listed species is required.
- Annual use of habitat is documented from information sources or field studies (annual can be based on study or determined anecdotally).
- **Agricultural fields with waste grains are commonly used by waterfowl; these are not considered SWH, except when used by Tundra Swans during the spring migration and staging period.** (emphasis added)

[151] The updated 2012 Draft Table 1.1 has been slightly modified. The habitat criteria column continues to list “fields with sheet water or fields utilized by Tundra Swans during Spring (mid-March to May)”, but includes an additional provision:

- Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless used by Tundra Swans in the Long Point, Rondeau, Lk. St. Clair, Grand Bend and Pt. Pelee areas.

[152] It also now directs evaluation methods are to follow the *Bird Guideline*.

[153] The Tribunal draws the following conclusions from this examination of the guidance available to assess the significance of the habitat:

- the number of tundra swans using the habitat is relevant to its significance;
- tundra swan use of waste grains in agricultural fields is an important element;
- the guidance remains “draft”, indicating that the definition of SWH may be subject to change; and

- the decision as to whether or not to consider the agricultural fields in the Project area as significant is not clear-cut, but involves the application of the assessor's discretion.

[154] Mr. Slaman argues that, if the NHA had been done properly, SWH would have been confirmed. Dr. Petrie expresses strong criticism that the bird count surveys were inadequate. The surveys conducted on behalf of the Approval Holder use an MNR approved method of "driving surveys", where the surveyor drives along roads and stops at several points to conduct visual surveys along the way to identify species and count birds. Dr. Petrie expressed his view that both winter and spring surveys should have been conducted and they should have included aerial searches. Mr. Slaman maintains that, due to the nature of the topography in the area, it would not be possible to see tundra swans roosting in Lake Erie in close proximity to the shoreline. In response to the use of the driving surveys, Ms. McGuinness indicated that this method is approved by EC-CWS, further noting that the federal government has regulatory jurisdiction over most migrating birds.

[155] Dr. Petrie further criticized the number and timing of bird count surveys. He indicated that only 10 tundra swan surveys were conducted over a two year period, four of them between March 27 and 31, 2009, and six between March 15 and April 1, 2012. He stated that most of these surveys were conducted too late in the spring as tundra swans are very early migrants, and most of them had already migrated through the region.

[156] The *Bird Guideline* addresses the protocol for stopover counts, stating that migration of waterfowl may commence in March. Ms. McGuinness testified that EC-CWS approves tundra swan bird count surveys in March.

[157] Dr. Petrie also criticizes the adequacy of the NHA, because it does not include an evaluation to identify the current foraging fields closely associated with critical staging habitat. In his view, individual wind turbines should be sited so as to avoid these areas, in order to minimize the potential for disturbance.

[158] HWC submits that Eco-Region 7E is very large, covering an area from Windsor to east of Toronto, and the data for tundra swan stopover times varies widely over the area. HWC therefore submits that more detailed information is required within the Eco-Region, if it is to reliably reflect the presence of the swans. Similarly, HWC submits that the description of tundra swan habitat and its use in the NHA Technical Guide, dated October 2000, needs to be updated.

[159] The Director submits that pre-construction surveys are not intended under the provincial scheme to provide reliable baseline information on species and habitat. The Director points to Ms. McGuiness's testimony, that Environment Canada conducts studies and collects information on migrating birds, and looks at trends in populations. She states that such data collection by the federal government will continue. The purpose of the pre-construction survey is to find how to locate the project components so as not to impact habitat. The Tribunal notes that the *SWH Technical Guide* includes the following comment in s. 8.3.4, Waterfowl stopover and staging areas:

The Canadian Wildlife Service (CWS) is the lead agency for waterfowl management in Canada. They routinely conduct migration surveys in late fall and early winter. CWS staff are knowledgeable of most of the major migration stopover sites.

[160] The Tribunal finds that the bird surveys for tundra swans took place within a reasonable window (March, to April 1). All experts agreed to this general timing window. Tundra swans were observed, and Stantec concluded there is tundra swan habitat in the Project area.

[161] However, due to year-to-year variability in the number of migrating swans, the NHA does not contain reliable conclusions as to the abundance of swans, and the extent of their use of the Project area. Ms. Kopysh testified the purpose of the NHA was to identify the existence of SWH, rather than estimate abundance. Ms. Riddell stated that, if SWH had been found, the MNR would have been very specific about the types of bird surveys that should take place, indicating that the MNR may have requested a pre-construction baseline survey to determine habitat and its use, in that case.

[162] The Tribunal agrees with Dr. Petrie's view that insufficient study has taken place for a full understanding of the impact of wind turbines on tundra swan habitat. Mr. Pelletier's view is that the Erie Shores project appears to show that the swans continue to use agricultural fields where turbines are located. However, the actual data supporting this view has not been filed with the Tribunal and no scientific study has been filed that specifically addresses this question.

[163] The Tribunal sees two practical consequences of the NHA conclusions that there is no tundra swan SWH in the Project area. First, mortality monitoring, and the consequent application of the mortality threshold under the *Bird Guideline*, will not occur during the spring migration period, because carcass surveys are not required to be conducted at this time of the year. Consequently, the protective measures found in an EIS and EEMP are not required for these fields. The Tribunal notes that some mortality monitoring would occur during the fall migration, but it is unclear whether monitoring will

continue during the full period of the fall migration, as tundra swans may remain beyond the October 31 completion dates for mortality monitoring.

[164] The second practical consequence is that the MNR did not require abundance surveys to be conducted. As a result, reliable baseline data on the number of tundra swans using the site pre-construction is unavailable. This, in turn, negatively impacts the ability of the MOE, the MNR and Approval Holder to accurately monitor over time the actual cumulative impact of the Project, and its cumulative impact together with other projects in the area. While Environment Canada has jurisdiction over migrating birds, and does conduct bird surveys which presumably include tundra swan populations, reliable site-specific data will not be available to contribute to the Database.

Findings on Issue 2b

[165] As a result of Stantec's interpretation that potential candidate SWH without sheet water cannot be confirmed SWH, the NHA does not provide an analysis of the number of tundra swans currently using agricultural fields to forage for cereal grains, nor does it identify foraging fields which Dr. Petrie describes as fields that are closely associated with critical staging habitat.

[166] The evidence adduced in this proceeding, therefore, does not include area specific data to identify whether the proposed siting for the Project's wind turbines are proximate to foraging field habitat, and only limited data respecting tundra swan abundance in the area, respecting both staging areas and foraging fields.

[167] This leaves the Tribunal with somewhat incomplete evidence on which to assess whether engaging in the Project in accordance with the REA will cause serious and irreversible harm to migrating tundra swans. It is regrettable that the MOE and the MNR have not required that the Approval Holder obtain adequate pre- and post-construction data respecting the impact of wind turbines on the behaviour of migrating tundra swans.

[168] However, as the Tribunal has already noted, the test the Appellants must satisfy under s. 145.2.1(2) of the *EPA* is not whether there are inadequacies in the surveys and assessments submitted by the Approval Holder in support of its application for the REA. The test is whether engaging in the Project in accordance with the REA will result in serious and irreversible harm to plant life, animal life or the natural environment. In proceeding with its analysis in light of the above described evidentiary limitations and scientific uncertainty, the Tribunal adopts an approach that agricultural fields located in the Project area that provide foraging habitat can be important habitat for tundra swans, irrespective of whether they qualify as SWH under the Guides. It should be noted that

the statutory test is not confined to harm to SWH. Rather, it covers serious and irreversible harm to plant life, animal life or the natural environment. Therefore, the Tribunal will consider whether impacts to such foraging habitat will cause serious and irreversible harm to tundra swans (i.e., animal life) or the natural environment.

[169] Some of the evidence is not in dispute. As Mr. Pelletier pointed out, whether an agricultural field contains field grains for any given year will depend on the farmer's cultivating practices. Tundra swans are adaptable and adept at taking advantage of available food sources. Dr. Petrie's study confirms that, on average, tundra swans fly a distance in the range of 8 to 10 km and, much further if necessary, to forage for food. The evidence does not indicate that tundra swans exhibit exclusive fidelity to certain feeding areas. To the contrary, Dr. Petrie confirmed that they have adapted their migration path to exploit their access to agricultural fields containing field grains. As Ms. McGuinness testified, EC-CWS maintains a migratory bird database and conducts surveys of these populations.

[170] Other evidence is inconclusive or contradictory. The evidence does not indicate whether tundra swans that roost in the vicinity of the Project area will remain and forage there exclusively for the duration of their migratory stopover. Mr. Pelletier did testify that they will go where they will find ready access to the most food, and are less likely to occupy areas that are less capable of providing foraging. On the question of avoidance behaviour, Mr. Pelletier indicates that tundra swans do not exhibit avoidance behaviour either pre- or post-construction, and that they will forage within a couple of hundred metres of a wind turbine. In support of this statement, he cites his review of information from other wind projects in North America regarding tundra swans. In particular, he referred to field report data from the Erie Shores development, which is located along the north shore of Lake Erie just west of Long Point. On the other hand, Dr. Petrie indicates that he has concerns regarding avoidance behaviour, relying on European studies respecting another species of swan and other waterfowl. However, he does not conclusively state that avoidance behaviour will occur, nor is the evidence determinative on the question of whether tundra swans will forage in agricultural fields adjacent to an area that they avoid due to wind turbine disturbance. Dr. Petrie confirmed that they could use such adjacent areas, but questions whether other wind farm facilities would impact such use. The evidence regarding the distance that tundra swans may fly to avoid a wind turbine is also in dispute. Mr. Pelletier, as noted above, says there is no recorded avoidance, while Dr. Petrie points to the Research Review Paper for other waterfowl species which indicates that mean avoidance distances for on-shore projects are 600 m. On the issue of cumulative impact, Dr. Petrie asserts that, although he

could not state there would be major cumulative effects, no one could state that there would not be. In contrast, Mr. Pelletier expresses the view that there is sufficient agricultural land between the Project area and areas to the west, near Long Point, where major concentrations of migrating tundra swans congregate.

[171] In weighing this contradictory evidence, the Tribunal acknowledges Dr. Petrie's concerns that avoidance of foraging habitat due to wind turbine disturbance, and related cumulative impacts, may occur. Further research is needed to evaluate whether these concerns are well-founded. However, these concerns must be considered in the context that tundra swans are adept and adaptable foragers.

[172] In conclusion, because the evidence before the Tribunal is inconclusive and contradictory, it does not support a finding that these concerns rise to the level where it can be said 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.

[173] However, in reaching this conclusion, the Tribunal has considered that there is inadequate Site-specific pre-construction data on the number of tundra swans that use the Project area for habitat to be able to usefully monitor for cumulative impacts over time. Further, the information that will be provided to the Database from this Project, which is an important tool for evaluating cumulative impact, will not include post-construction collision mortality monitoring for this species during its spring migration.

[174] The Tribunal is therefore making recommendations for consideration by the Director and the Approval Holder, related to the collection of data to monitor the issue of potential cumulative impacts of this Project on tundra swan habitat, over time.

Recommendations

[175] The Tribunal recommends that studies be conducted by the appropriate agencies to monitor over time the impact of wind turbine projects on the migratory staging and foraging habitats for tundra swans along the northern shoreline of Lake Erie.

[176] Specific to this REA, in light of the Director's authority under s. 47.5.3 of the *EPA*, the Tribunal recommends to the Director and the Approval Holder that the following be added to terms and conditions of the Wind REA:

Natural Heritage Pre- and Post-Construction Monitoring

Pre-Construction Monitoring

1. The Approval Holder, in consultation with relevant agencies, should conduct one additional year of tundra swan bird surveys, including abundance

surveys, for the Project area, to take place in 2013, during the time period when migrating tundra swans can be expected to be present in the Project area.

Post-Construction Monitoring

The post-construction mortality monitoring requirements of the REA should be extended to include the time period when migrating tundra swans can be expected to be present in the Project area.

[177] It is intended that this additional data would be used to enhance the available natural heritage baseline and post-construction information, for the purposes of more fully evaluating impacts following construction and operation of the Project, and, in the future, to evaluate cumulative impacts should other renewable energy projects along the north shore of Lake Erie be constructed.

DECISION

[178] The Tribunal finds that the Appellants have not established that engaging in the Project in accordance with the REA will result in serious harm to human health.

[179] The Tribunal finds that the Appellants have not established that engaging in the Project in accordance with the REA will result in serious and irreversible harm to plant life, animal life, or the natural environment. Consequently, the Appellants' appeals are dismissed and the Director's decision is confirmed.

Appeals Dismissed

"Dirk VanderBent"

Dirk VanderBent, Panel Chair

"Heather I. Gibbs"

Heather I. Gibbs, Vice-Chair

Appendix A – Relevant Legislation and Regulation

Appendix B - Renewable Energy Approval Number 2869-8VDRCV (Excerpts)

Appendix C - Significant Wildlife Habitat Technical Guide, October 2000 (Excerpts)

Appendix D - Eco-region 7E Criterion Schedule – Draft February 2012 (Excerpts)

Appendix A

Relevant Legislation and Regulation

Environmental Protection Act

47.5 (3) On application or on his or her own initiative, the Director may, if in his or her opinion it is in the public interest to do so,

- (a) alter the terms and conditions of a renewable energy approval after it is issued;
- (b) impose new terms and conditions on a renewable energy approval; or
- (c) suspend or revoke a renewable energy approval.

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.

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.

O. Reg. 359/09

NATURAL HERITAGE

Environmental effects monitoring plan

23.1 (1) A person who proposes to engage in a renewable energy project in respect of a Class 3, 4 or 5 wind facility shall prepare an environmental effects monitoring plan in respect of birds and bats.

(2) For the purposes of subsection (1), the person shall prepare the environmental effects monitoring plan in accordance with the following publications of the Ministry of Natural Resources:

1. "Birds and Bird Habitats: Guidelines for Wind Power Projects" dated October 2010, as amended from time to time and available from the Ministry of Natural Resources.
2. "Bats and Bat Habitats: Guidelines for Wind Power Projects" dated March 2010, as amended from time to time and available from the Ministry of Natural Resources.

Natural heritage assessment

24. (1) A person who proposes to engage in a renewable energy project shall conduct a natural heritage assessment, consisting of the following:

1. A records review conducted in accordance with section 25.
2. A site investigation conducted in accordance with section 26.
3. Subject to subsection (3), an evaluation of the significance or provincial significance of each natural feature identified in the course of the records review and site investigation, conducted in accordance with section 27.

(2) For the purposes of this section and sections 25 and 26, in conducting a records review or a site investigation, identifying natural features and determining the boundaries of any natural features, a person mentioned in subsection (1) shall use applicable evaluation criteria or procedures established or accepted by the Ministry of Natural Resources, as amended from time to time.

(3) This section and sections 25, 26, 27 and 28 do not apply in respect of a proposal to engage in a renewable energy project in respect of a Class 2 wind facility.

Natural heritage, records review

25. (1) In conducting a records review mentioned in paragraph 1 of subsection 24 (1), a person who proposes to engage in a renewable energy project shall ensure that a search for and analysis of the records set out in Column 1 of the Table to this section are conducted in respect of the project location for the purpose of making the determinations set out opposite the records in Column 2 of the Table.

(2) For the purposes of this section, "natural feature" includes all or part of,

- (a) a sand barrens, a savannah, a tallgrass prairie and an alvar, if the records review is being conducted in respect of a project location that is in the Protected Countryside; and

(b) a sand barrens, a savannah and a tallgrass prairie, if the records review is being conducted in respect of 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..

(3) The person mentioned in subsection (1) shall prepare a report setting out a summary of the records searched and the results of the analysis conducted under subsection (1).

Table

Item	Column 1	Column 2
	Records to be searched and analyzed	Determination to be made
1.	Records that relate to provincial parks and conservation reserves and that are maintained by the Ministry of Natural Resources.	Whether the project location is in a provincial park or conservation reserve or within 120 metres of a provincial park or conservation reserve.
2.	Records that relate to natural features and that are maintained by, <ul style="list-style-type: none"> i. the Ministry of Natural Resources, ii. the Crown in right of Canada, iii. a conservation authority, if the project location is in the area of jurisdiction of the conservation authority, iv. each local and upper-tier municipality in which the project location is situated, v. the planning board of an area of jurisdiction of a planning board in which the project location is situated, vi. the municipal planning authority of an area of jurisdiction of a municipal planning authority in which the project location is situated, vii. the local roads board of a local roads area in which the project location is situated, viii. the Local Services Board of a board area in which the project location is situated, and ix. the Niagara Escarpment Commission, if the project location is in the area of the Niagara Escarpment Plan. 	Whether the project location is, <ul style="list-style-type: none"> i. in a natural feature, ii. within 50 metres of an area of natural and scientific interest (earth science), or iii. within 120 metres of a natural feature that is not an area of natural and scientific interest (earth science).

O. Reg. 359/09, s. 25, Table.

Natural heritage, site investigation

26. (1) Subject to subsection (1.1), for the purposes of conducting a site investigation mentioned in paragraph 2 of subsection 24 (1), a person who proposes to engage in a renewable energy project shall ensure that an investigation of the air, land and water within 120 metres of the project location is conducted, either by visiting the site or by an alternative investigation of the site, in order to determine,

- (a) whether the results of the analysis summarized in the report prepared under subsection 25 (3) are correct or require correction, and identifying any required corrections;
- (b) whether any additional natural features exist, other than those that were identified in the report prepared under subsection 25 (3);

- (c) the boundaries, located within 120 metres of the project location, of any natural feature that was identified in the records review or the site investigation; and
- (d) the distance from the project location to the boundaries determined under clause (c).

(1.1) The person mentioned in subsection (1) may conduct an alternative investigation of the site only if he or she determines that it is not reasonable to conduct a site investigation by visiting the site.

(2) For the purposes of this section, “natural feature” includes all or part of,

- (a) a sand barrens, a savannah, a tallgrass prairie and an alvar, if the site investigation is being conducted in respect of a project location that is in the Protected Countryside; and
- (b) a sand barrens, a savannah and a tallgrass prairie, if the site investigation is being conducted in respect of 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.

(3) The person mentioned in subsection (1) shall prepare a report setting out the following with respect to the air, land and water in respect of which any site investigation was conducted:

1. A summary of any corrections to the report prepared under subsection 25 (3) and the determinations made as a result of conducting the site investigation.
2. Information relating to each natural feature identified in the records review and in the site investigation, including the type, attributes, composition and function of the feature.
3. A map showing,
 - i. all boundaries mentioned in clause (1) (c),
 - ii. the location and type of each natural feature identified in relation to the project location, and
 - iii. all distances mentioned in clause (1) (d).
4. A summary of methods used to make observations for the purposes of the site investigation.
5. The name and qualifications of the person conducting the site investigation.
6. If an investigation was conducted by visiting the site:
 - i. The dates and times of the beginning and completion of the site investigation.
 - ii. The duration of the site investigation.
 - iii. The weather conditions during the site investigation.
 - iv. Field notes kept by the person conducting the site investigation.
7. If an alternative investigation of the site was conducted:

- i. The dates of the generation of the data used in the site investigation.
- ii. An explanation of why the person who conducted the alternative investigation determined that it was not reasonable to conduct the site investigation by visiting the site.

Natural heritage, evaluation of significance

27. (1) In conducting the evaluation of the significance or provincial significance of a natural feature for the purposes of paragraph 3 of subsection 24 (1), a person who proposes to engage in a renewable energy project shall consider any information available to the person relating to natural features, including,

- (a) all information obtained during the records review conducted in accordance with section 25;
- (b) all information obtained during any site investigation conducted in accordance with section 26; and
- (c) all information received from the public, aboriginal communities, municipalities, local road boards and Local Services Boards until such time as the report mentioned in subsection 27 (4) has been prepared.

(2) For the purposes of the evaluation under subsection (1), a person shall determine that a natural feature is significant if it is a woodland, a valleyland or a wildlife habitat,

- (a) that the Ministry of Natural Resources has identified as significant; or
- (b) that is considered to be significant when evaluated using evaluation criteria or procedures established or accepted by the Ministry of Natural Resources, as amended from time to time, for significant natural features.

(3) For the purposes of the evaluation under subsection (1), a person shall determine that a natural feature is provincially significant if it is a southern wetland, a northern wetland, a coastal wetland, an area of natural and scientific interest (earth science) or an area of natural and scientific interest (life science),

- (a) that the Ministry of Natural Resources has identified as provincially significant; or
- (b) that is considered to be provincially significant when evaluated using evaluation criteria or procedures established or accepted by the Ministry of Natural Resources, as amended from time to time, for provincially significant natural features.

(4) The person mentioned in subsection (1) shall prepare a report that sets out the following:

1. For each natural feature shown on the map mentioned in paragraph 3 of subsection 26 (3), a determination of whether the natural feature is provincially significant, significant, not significant or not provincially significant.

2. A summary of the evaluation criteria or procedures used to make the determinations mentioned in paragraph 1.
 3. The name and qualifications of any person who applied the evaluation criteria or procedures mentioned in paragraph 2.
 4. The dates of the beginning and completion of the evaluation.
- (5) This section does not apply if the project location is,
- (a) at least 50 metres outside of all areas of natural and scientific interest (earth science); and
 - (b) at least 120 metres outside of all natural features that are not areas of natural and scientific interest (earth science).
- (6) If the project location is in the Protected Countryside or in the portion of the Oak Ridges Moraine Conservation Plan Area that is subject to the Oak Ridges Moraine Conservation Plan, this section does not apply in respect of,
- (a) a sand barrens, a savannah, a tallgrass prairie or an alvar; or
 - (b) an area of natural and scientific interest (life science) that has been identified by the Ministry of Natural Resources using evaluation procedures established by that Ministry, as amended from time to time, but that has not been identified by that Ministry as provincially significant.

Confirmation from Ministry of Natural Resources

28. (1) A person who proposes to engage in a renewable energy project shall submit to the Ministry of Natural Resources each plan the person is required to prepare under section 23.1 and each report the person is required to prepare under subsections 25 (3), 26 (3) and 27 (4).

(2) The person mentioned in subsection (1) shall obtain the following in writing from the Ministry of Natural Resources:

1. Confirmation that the determination of the existence of natural features and the boundaries of natural features was made using applicable evaluation criteria or procedures established or accepted by that Ministry, as amended from time to time.
2. Confirmation that the site investigation and records review were conducted using applicable evaluation criteria or procedures established or accepted by that Ministry, as amended from time to time, if no natural features were identified.
3. Confirmation that the evaluation of the significance or provincial significance of the natural features was conducted using applicable evaluation criteria or procedures established or accepted by that Ministry, as amended from time to time.
4. If the person has determined that the project location is not in a provincial park or conservation reserve, confirmation that that Ministry agrees with the determination.
5. If the person has determined that the project location is in a provincial park or conservation reserve, confirmation that engaging in the project is not prohibited by or under the *Provincial Parks and Conservation Reserves Act, 2006*.

6. If section 23.1 applies, comments received from the Ministry of Natural Resources in respect of the environmental effects monitoring plan required under that section.

(3) As part of an application for the issue of a renewable energy approval, the person mentioned in subsection (1) shall submit,

- (a) the plan and reports mentioned in subsection (1);
- (b) a copy of any confirmation or comment required under subsection (2); and
- (c) any additional written comments provided by the Ministry of Natural Resources in respect of the natural heritage assessment.

Appendix B

Renewable Energy Approval Number 2869-8VDRCV (Excerpts)

K – NATURAL HERITAGE PRE- AND POST- CONSTRUCTION MONITORING

PRE-CONSTRUCTION MONITORING

K1. The Company shall implement the pre-construction monitoring described in the report included in the Application and entitled Port Dover and Nanticoke Wind Project Natural Heritage Assessment and Environmental Impact Study Addendum, dated April 2011, and prepared by Stantec Consulting Ltd. This shall include:

- (1) a baseline survey of bald eagle nesting and fledging activity and flight patterns, to establish pre-construction data.

K2. If the Company determines that it must deviate from the pre-construction monitoring described in Condition K1, the Company shall contact the Southern Region Renewable Energy Operations Coordinator of the Ministry of Natural Resources and the Director, prior to making and changes to the methodology, and follow any directions provided.

POST-CONSTRUCTION MONITORING, INCLUDING BIRD AND BAT MORTALITY MONITORING

K3. The Company shall implement the post-construction monitoring described in the reports included in the Application and entitled Environmental Effects Monitoring Plan for Wildlife and Wildlife Habitat, submitted April 2012, and prepared by Stantec Consulting Ltd., and Natural Heritage Assessment and Environmental Impact Study Addendum, dated April 2011, and prepared by Stantec Consulting Ltd. This shall include:

- (1) disturbance monitoring for forest breeding birds;
- (2) disturbance monitoring for amphibian breeding habitat;
- (3) monitoring of bald eagle nesting and fledging activity and flight patterns; and
- (4) bird and bat mortality monitoring.

K4. If the Company determines that it must deviate from the monitoring described in Condition K3, the Company shall contact the Southern region Renewable Energy Operations Coordinator of the Ministry of Natural Resources and the Director, prior to making any changes to the methodology, and follow any directions provided.

REPORTING AND REVIEW OF RESULTS

K5. The Company shall contact the Southern Region Renewable Energy Operations Coordinator of the Ministry of Natural Resources and the Director if there are any applicable thresholds as described in the Environmental Effects Monitoring Plan for Wildlife and Wildlife Habitat reached or exceeded as follows:

- (1) 10 bats per turbine per year;
- (2) 14 birds per turbine per year at individual turbines or turbine groups;
- (3) 0.2 raptors per turbine per year (all raptors) across the Facility;
- (4) 0.1 raptors per turbine per year (raptors of provincial conservation concern) across the Facility;
- (5) 10 or more birds at any one turbine during a single monitoring survey; or
- (6) 33 or more birds (including raptors) at multiple turbines during a single monitoring survey.

K6. The Company shall report mortality levels to the Ministry of Natural Resources for the first three (3) years following the commencement of the operation of the Facility, on an annual basis and within three (3) months of the conclusion of the October mortality monitoring, with the exception of the following (threshold references are to the actual number of species observed in the field, prior to correction factors):

- (1) where a single mortality monitoring event exceeds 10 or more birds at any one turbine or 33 or more birds (including raptors) at multiple turbines the mortality event shall be reported to the Ministry of Natural Resources within 48 hours of observation;
- (2) any and all mortality or injury of species at risk (including a species listed on the Species at Risk in Ontario list as Extirpated, Endangered or Threatened under the provincial *Endangered Species Act, 2007*) that occurs shall be reported to the Ministry of Natural Resources within 48 hours;
- (3) where operational mitigation is applied for bats, an additional three (3) years of effectiveness monitoring is required and the Company shall report mortality levels to the Ministry of Natural Resources for three (3) years following the commencement of such operational mitigation on an annual basis and within three (3) months of the conclusion of the October mortality monitoring;

- (4) where operational mitigation is applied for birds, for turbines located outside 120 metres of bird significant wildlife habitat, two (2) years of subsequent mortality and effects monitoring is required for those turbines where a significant annual bird or raptor mortality threshold is exceeded and the Company shall report mortality levels to the Ministry of Natural Resources for two (2) years following the observance of any such exceedance on an annual basis and within three (3) months of the conclusion of the October mortality monitoring; and
- (5) where operational mitigation is applied for birds, for turbines located within 120 metres of bird significant wildlife habitat, three (3) years of effectiveness monitoring for those turbines where the exceedances were observed is required. The Company shall report effectiveness monitoring results to the Ministry of Natural Resources for up to three (3) years following the observance of any such exceedance, on an annual basis and within three (3) months of the conclusion of the effectiveness monitoring.

OPERATIONAL MITIGATION

K7. The Company shall implement, as necessary, operational mitigation measures consistent with those identified in the document entitled Bats and Bat Habitats: Guidelines for Wind Power Projects, dated July 2011, and available from the Ministry of Natural Resources, and shall include either of the following mitigation measures:

- (1) increasing cut-in speed to 5.5 m/s or feathering 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; or
- (2) where an agreement between the Company and the Ministry of Natural Resources can be reached, an alternate operational mitigation plan agreed to between the Company and the Ministry of Natural Resources;

K8. Where annual mortality levels exceed 14 birds per turbine per year at individual turbines or turbine groups or 0.2 raptors or vultures per turbine per year across the Facility or 0.1 raptors of provincial conservation concern per turbine per year across the Facility, the Company shall contact the Ministry of Natural Resources to initiate an appropriate response plan that shall include one or more of the following mitigation measures:

- (1) increased reporting frequency to identify potential threshold exceedance;
- (2) additional behavioural studies to determine factors affecting mortality rates;

- (3) periodic shut-down of select turbines;
- (4) blade feathering at specific times of year; or
- (5) an alternate plan agreed to between the Company and the Ministry of Natural Resources.

Appendix C

Significant Wildlife Habitat Technical Guide, October 2000 (Excerpts)

Appendix K. Significant waterfowl habitat, p. 306

3. Specific Habitats

The habitat of significant species can be identified by two categories: locations that are known and mapped; and locations that are unknown and must be mapped on the basis of population status and landform preference.

a) Known and mapped Locations

The following sites are significant for waterfowl:

- Long Point;...

p. 308

The following landforms characteristically provide significant waterfowl habitat and need to be examined:

Landform Type	Measures of Significance
Wetlands	<ul style="list-style-type: none"> • Type of wetland: using the definitions in the Provincial Wetlands Classification System, marshes and swamps are more important than bogs or fens • Size of wetland: small wetlands (based on confirmed boundaries) are important but as wetland size increases, so do the local values – larger may be better in some municipalities • Groups of wetlands: clusters of wetlands (more than 10 within 1,000 m of the centre of each) are more important than single wetlands • Peripheral lands: uplands, such as grass and shrub habitats, as well as pastureland within a significant distance can provide important nesting habitat
Poorly Drained Landscapes	<ul style="list-style-type: none"> • Stream & Riverine Bottomlands: floodlands provide important waterfowl habitat • Soils: certain soil types (i.e. Farmington series as determined by soil maps or Ontario land Inventory maps) are useful indicators of important habitat. • Potholes: terrain with over 50 small wetlands per sq. km. are important waterfowl habitats • Beaver Ponds: terrain with over 25 ponds per 10 sq. km. are important habitats • Seasonal Wet Locations: seasonally flooded locations, even those under active cultivation, such as sheetwater or meltwater areas and poorly drained croplands provide seasonally important pre-nesting habitat

NAWMP Project Sites	These wetland enhancement locations are undertaken only on important waterfowl habitats
Coastal Marshes	The shores of Great Lakes and other large inland lakes provide uncommon but valuable locations for breeding and staging waterfowl

Significant Wildlife Habitat Technical Guide – Appendix Q. Evaluation Criteria for Seasonal Concentration Habitats

Table Q-1: Evaluation Criteria for Seasonal Concentration Habitats (p.345)

Specific Habitat	Suggested Criteria	Guidelines for Evaluation
Waterfowl stopover and staging areas	<ul style="list-style-type: none"> • relative importance of the site to local waterfowl populations • presence of species of conservation concern • species diversity • abundance • quality of habitat • size of site 	<ul style="list-style-type: none"> • Significant sites are generally the only known sites in the planning area; significant sites may be one of only a few in the area. • Most significant sites support several species of concern; significant sites support one species. • Site with the greatest number of species are more significant • Site with the highest number of species are more significant. • Trumpeter Swans and Ruddy Ducks have limited staging areas in Ontario, and their regular use of the habitat should be considered significant. • Regular staging areas for Canvasbacks and Redheads should be considered significant. • Significant sites generally have better habitat (e.g., optimal vegetation composition, ratio of open water to emergent vegetation; extensive shoreline; abundant food, nocturnal roosting cover) • Larger wetlands are more significant.
...		
Landbird migratory stopover areas	<ul style="list-style-type: none"> • relative importance of the site • presence of species of conservation concern • species diversity • abundance • size of site • habitat diversity • historical use of site 	<ul style="list-style-type: none"> • Significant sites are generally the only known sites in the planning area; significant sites may be one of only a few in the area; • Most significant sites support several species of concern; significant sites support one species. • Sites with the greatest number of species are more significant.

	<ul style="list-style-type: none"> • location of site 	<ul style="list-style-type: none"> • Sites with the highest number of individuals are more significant. • Large sites are more significant than smaller sites. • Sites with a variety of habitat types (e.g., forest, grassland) are often more significant than site with homogeneous habitat. • Sites that have been used for many years are more significant. • Sites within 5 km of Lake Ontario and Lake Erie shoreline are most significant.
<p>Turkey Vultures summer roosting areas</p>	<ul style="list-style-type: none"> • Relative importance of the site • Abundance • Level of disturbance • Historical use of the area 	<ul style="list-style-type: none"> • Significant sites are generally the only known sites in the planning area; significant sites may be one of only a few in the area. • Sites with the highest number of individuals are most significant. • Least disturbed sites may be more significant. • Sites that have been traditionally used for at least 10 years are more significant.

Eco-region 7E Criterion Schedule – Draft February 2012 (Excerpts)

Table 1.1 Seasonal Concentration Areas of Animals.

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria
<p>Waterfowl Stopover and Staging Areas (Terrestrial)</p> <p><u>Rationale:</u> Habitat important to migrating waterfowl.</p>	<p>American Black Duck Northern Pintail Gadwall Blue-winged Teal Green-winged Teal American Wigeon Northern Shoveler Tundra Swan</p>	<p>CUM1 CUT1 - Plus evidence of annual spring flooding from melt water or run-off within these Ecosites. - Fields with waste grain in the Long Point, Rondeau, Lk. St. Clair, Grand Bend and Pt. Pelee areas may be important to Tundra Swans.</p>	<p>Fields with sheet water or fields utilized by Tundra Swans during Spring (mid-March to May).</p> <ul style="list-style-type: none"> • Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. • Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless used by Tundra Swans in the Long Point, Rondeau, Lk. St. Clair, Grand Bend and Pt. Pelee areas. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> • Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence. 	<p>Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi}</p> <ul style="list-style-type: none"> • Any mixed species aggregations of 100^l or more individuals required. • The area of the flooded field ecosite habitat plus a 100-300 m radius buffer dependant on local site conditions and adjacent land use is the significant wildlife habitat ^{cxlviii}. • Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates). • SWHDSS^{cxlix} Index #7

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria
			<ul style="list-style-type: none"> • Reports and other information available from Conservation Authorities (CAs) • Sites documented through waterfowl planning processes (e.g. EHJV implementation plan) • Naturalist Clubs • Ducks Unlimited Canada • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area 	provides development effects and mitigation measures.
<p>Waterfowl Stopover and Staging Areas (Aquatic)</p> <p><u>Rationale:</u> Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites</p>	Green-winged Teal American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Blue-winged Teal Wood Duck Hooded Merganser Common Merganser Red-breasted Merganser Lesser Scaup Greater Scaup Ring-necked duck Common Goldeneye	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4	<ul style="list-style-type: none"> • Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water); <p><u>Information Sources</u></p>	Studies carried out and verified presence of: <ul style="list-style-type: none"> • Aggregations of 100¹ or more of listed species for 7 days¹, results in > 700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH ^{cxlix} • The combined area of the ELC ecosites and a 100 m radius area is the SWH ^{cxlviii} • Wetland area and shorelines associated with

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria
identified are usually only one of a few in the eco-district.	Bufflehead Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Canvasback Redhead Ruddy Duck Brant White-winged Scoter Black Scoter Tundra Swans	SWD5 SWD6 SWD7	<ul style="list-style-type: none"> Canadian Wildlife Service staff know the larger, most significant sites. Check website: http://wildspace.ec.gc.ca Naturalist clubs often are aware of staging/stopover areas. OMNR Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. Sites documented through waterfowl planning processes (e.g. EHJV implementation plan) Ducks Unlimited projects Element occurrence specification by Nature Serve: http://www.natureserve.org NHIC Waterfowl Concentration Area 	<p>sites identified within the SWHTG ^{cxlviii} Appendix K ^{cxlix} are significant wildlife habitat.</p> <ul style="list-style-type: none"> Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). SWHDSS^{cxlix} Index #7 provides development effects and mitigation measures.

Schedule 3: Eco-region 7E Criterion Schedule – Working Draft January 2009 (Excerpts)

Table 1.1 Seasonal Concentration Areas for Wildlife Species.

Wildlife Habitat	Wildlife Species	ELC Ecosite Codes	Habitat Characteristics and Information Sources	CONFIRMED SWH and Defining Criteria
<p>Waterfowl Stopover and Staging Areas (Terrestrial)</p> <p><u>Rationale:</u> Habitat important to migrating waterfowl.</p>	<p>American Black Duck Northern Pintail Gadwall Blue-winged Teal American Green-winged Teal American Wigeon Northern Shoveler Tundra Swan</p>	<p>CUM1 CUT1 Plus evidence of annual spring flooding from melt water or run-off within these Ecosites.</p> <p>Fields with waste grain in the Long Point, Rondeau, Lk. St. Clair, Grand Bend and Pt. Pelee areas may be important to Tundra Swans.</p>	<p>Fields with sheet water or fields utilized by Tundra Swans during Spring (March to May).</p> <ul style="list-style-type: none"> • Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. • Anecdotal information from the landowner, adjacent landowners, or local naturalist clubs may be good information in determining occurrence. • ESA Reports prepared by Conservation Authorities • Sites documented through waterfowl planning processes (e.g., EHJV implementation plan) • local naturalist clubs • Ducks Unlimited Canada • Long Point Bird Observatory 	<p>Studies carried out and verified presence of an annual concentration of any listed species:</p> <ul style="list-style-type: none"> • Aggregation of 100¹ or more of any one of the listed species is required. • Annual use of habitat is documented from information sources or field studies (annual can be based on study or determined anecdotally). • Agricultural fields with waste grains are commonly used by waterfowl; these are not considered SWH, except when used by Tundra Swans during the spring migration and staging period. • SWHDSS cxlix Index #7 provides development effects and mitigation measures.
<p>Waterfowl Stopover and Staging Areas (Aquatic)</p>	<p>American Green-winged Teal American Black Duck Northern Pintail</p>	<p>MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2</p>	<ul style="list-style-type: none"> • Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment 	<p>Studies carried out and verified presence of:</p> <ul style="list-style-type: none"> • Habitat used annually during spring, fall, or both seasons of

Wildlife Habitat	Wildlife Species	ELC Ecosite Codes	Habitat Characteristics and Information Sources	CONFIRMED SWH and Defining Criteria
<p>Rationale: Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the ecodistrict.</p>	<p>Northern Shoveler American Wigeon Gadwall Blue-winged Teal Wood Duck Hooded Merganser Common Merganser Red-breasted Merganser Lesser Scaup Greater Scaup Ring-necked duck Common Goldeneye Bufflehead Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Canvasback Redhead Ruddy Duck Brant White-winged Scoter Black Scoter Tundra Swans</p>	<p>MAS3 SAS1 SAM1 SAF1 SWD1 SWD3</p>	<p>ponds and storm water ponds do not qualify as SWH, but a reservoir managed as large wetland or pond/lake does.</p> <ul style="list-style-type: none"> • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water). • Canadian Wildlife Service staff know the larger, most significant sites. Check website: http://wildspace.ec.gc.ca • Naturalist clubs often are aware of staging/stopover areas. • OMNR Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. • Sites documented through waterfowl planning processes (e.g., EHJV implementation plan) • Ducks Unlimited Canada 	<p>any listed species.</p> <ul style="list-style-type: none"> • Annual use of habitat is documented from information sources or field studies (annual can be based on study or determined anecdotally). • Aggregations of 100¹ or more of any one of listed species and 2-3 birds/ha for 7-20 days¹ • SWHDSS cxlix Index #7 provides development effects and mitigation measures.