

DIGBY WIND POWER PROJECT ENVIRONMENTAL ASSESSMENT

Follow-Up and Monitoring

6 FOLLOW-UP AND MONITORING

SkyPower is committed to conducting monitoring activities to address residual environmental effects with a high level of concern or uncertainty. While it is anticipated that the residual environmental effects of the Digby Wind Power Project will not be significant, an Environmental Management Plan (EMP) and corresponding Environmental Protection, Monitoring, and Contingency Plans will be developed to address potential issues and concerns. In addition, there are site-specific pre-construction follow-up measures which SkyPower is committed to in order to assist with micrositing of turbine and access road locations, refine mitigation as required, and support environmental regulatory approvals as required (e.g., Water Approvals). The level of information contained in this EA Registration is considered sufficient to confidently predict the significance of residual Project-related environmental effects (including cumulative effects).

6.1 Pre-Construction Surveys and Approvals

As discussed in Section 4.4.1, if deemed necessary, SkyPower is committed to conducting a second breeding bird survey in the Project Area (including wind farm site and transmission line) to supplement existing data. This survey will be conducted in June 2009 and will be conducted by a qualified birder familiar with Environment Canada (CWS) bird survey protocols. This data will be provided to CWS and will be used to refine Project siting as required.

As part of the detailed surveying and siting process, a follow-up vegetation survey may be conducted to confirm appropriate siting of Project. It is anticipated that in the event that a species of conservation concern is identified, the specific footprint of the infrastructure (e.g., turbine foundation, transmission pole) can be adjusted to avoid this constraint and/or additional site specific mitigation plans can be developed.

Watercourses and wetlands will be avoided to the greatest extent practical. Where these features are unavoidable, approval will be sought from NSE and DFO as appropriate for alteration. Follow-up watercourse and/or wetland functional analyses will be conducted as required to complete applications for approval. Habitat compensation planning, if required, will be done in consultation with NSE and/or DFO to ensure no net loss of function/habitat.

Archaeological follow-up work will be considered based on final design and layout of Project infrastructure and proximity to areas deemed to have high potential for First Nation's archaeological resources. The MEKS may also provide guidance on archaeological follow-up. Such work could include more in-depth background research, a pedestrian survey of the high potential areas, possibly, sub-surface testing and/or monitoring of high potential areas subject to excavation. This work would be done by a professional archaeologist in consultation with the Nova Scotia Museum (NSM).

6.2 Follow-up and Monitoring Programs

The following section provides a brief overview of the Project follow-up and monitoring measures to be implemented to support construction and operations activities.

The EMP is generally overseen by the Operations Manager, but all Project personnel will be trained in their specific requirements towards its implementation. Training will include the safe handling of hazardous materials and petroleum products, compliance with WHMIS, proper use of on-site firefighting equipment, and an environmental orientation prior to initiating on-site work.

The Environmental Protection Plan (EPP) is a key component of the EMP, and will be developed for both the Construction and Operations phases of the Project. The EPP for the construction period aims to reduce the environmental impact during construction activities and consists of environmental protection measures for routine activities associated with the construction of the Project; contingency procedures in the event of an erosion control failure, fuel and hazardous material spill, fire and/or encounter of archaeological and heritage resources; environmental monitoring, inspection and reporting requirements; a list of applicable permits, approvals and authorizations; and a key contact list. The EPP for the operating period aims to reduce the environmental impact of the operation activities and consists of guidelines for equipment maintenance activities;

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the safe storage, handling, and disposal of petroleum, oils and lubricants (POL); and the safe storage, handling and disposal of hazardous materials.

Environmental Monitoring is a key component of the EMP. Table 6.1 outlines the Environmental Monitoring Programs that will be in place for the Digby Wind Power Project.

The last aspect of the EMP is the Contingency Procedure Plan, which consists of a detailed response system in the event of the accidental release of POLs or other hazardous materials. Aspects of the plan include environmental concerns; personnel training; prevention measures; response-action plan, and a spill clean-up resource list.

Table 6.1 Environmental Monitoring Programs (Operations)

Component	Method	Timing	Response-Action Plan
Sound	In response to noise complaints, if any occur, SkyPower would measure ambient sound levels and wind speed at selected residential receptors. The sound and wind data will then be combined to produce a plot of background ambient sound pressure levels versus wind speed.	In response to noise complaints, if any occur.	If the ambient sound levels at any residential receptors are higher than existing allowable limits, a report shall be filed with the NSE with the particulars of the concern, the suspected source, and any remedial actions taken or to be taken to resolve the concern. If the noise exceedance is related to equipment wear, the maintenance schedule will be adjusted to account for this and minimize the potential for a reoccurrence.
Shadow Flicker	A registry will be created to document complaints of shadow flicker. In the event of a complaint, shadow flicker will be monitored from that receptor using photographs, and/or video recording at the appropriate time of day and year. Anecdotal information about shadow flicker will be collected from nearby residences.	Shadow flicker will be monitored as required during operation of the turbine. If required, it will be conducted once during the summer and once during the winter.	When a complaint or complaints of shadow flicker are received from a receptor located within 1,000 m of the turbine, shadow flicker will be monitored from that receptor. Information collected from the shadow flicker monitoring will be used will be used to develop further mitigation, if warranted.
Bird and Bat Mortality	Bird and bat carcass monitoring will be performed within a 40 m radius of each selected turbine. The fatality rate will require correction for scavenger removal of carcasses and field observation abilities of surveyors. The monitoring program will be confirmed with Environment Canada (CWS) and NSDNR.	It is expected that monitoring of bird mortality will be conducted during the two years year following wind farm commissioning, with emphasis placed on surveying during peak spring and fall migration of birds and fall migration of bats.	It is likely that two years of monitoring will be conducted for bats and birds, to be determined in consultation with NSDNR and CWS
Aesthetics and Visual Impacts	A registry will be established to record both negative and positive comments on the aesthetics and	Photographs will be taken at least once after the turbines become	Information collected from the aesthetics and visual impact monitoring will be used to develop further mitigation, if required.

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Table 6.1 Environmental Monitoring Programs (Operations)

Component	Method	Timing	Response-Action Plan
	visual impact of the wind turbines. Media comment on the wind turbines will also be collected and documented. If required, photographs will be taken of the turbine locations from a minimum of two vantage points.	operational. The comment registry will be maintained and media comment will be collected throughout the operation of the Project.	
Electromagnetic Interference	A complaint resolution system will be in place to record and investigate complaints regarding telecommunications interference.	In response to interference complaints, if any occur.	Mitigation will be conducted on a case by case basis pending results of the investigation.

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7 STAKEHOLDER CONSULTATION AND ABORIGINAL ENGAGEMENT

Public consultation is an integral part of the environmental planning process and plays a key role in addressing potential public concerns identified in early stages of the Project. Public consultation is a requirement under NSE's "The Proponent's Guide to Wind Power Projects: Guide to Preparing an Environmental Assessment Registration Document" (NSEL 2007, updated 2008) and is a step in the environmental registration process.

Consultation activities have included the initial public announcement of the Project by SkyPower and NSPI in Rosway (May 2008), a public Open House (November 2008), meetings with stakeholders including local landowners and municipal representatives and various informal meetings, phone calls and letters. The following sections present further details on those opportunities given to the public and reviewing agencies for comment. Supporting documentation is provided in Appendix A. The public will continue to be consulted in future phases of development. During the EA review process, additional issues may be raised by the public and the public will be invited to submit written comments on the proposed Project and information contained in the EA document during the EA registration phase.

7.1 Community Consultation

An Open House public meeting was held on November 17, 2008 from 5:00 pm to 8:00 pm at the Rosway Community Centre. The session was attended by more than 30 people. The intent of the Open House session was:

- to encourage dialogue between members of the Project team in attendance and the general public and stakeholders;
- to enable the public and stakeholders to obtain Project information;
- to view information on the proposed site and turbine locations; and
- to participate in the environmental and socio-economic assessment process.

The session was advertised in the provincial edition of the Chronicle Herald newspaper.

During the Open House, representatives from Skypower Corp., Scotian WindFields Inc., and Jacques Whitford Stantec Limited were present to answer questions and to document any issues related to the Project. All attendees were encouraged to sign-in and they were provided with a folder of information titled "Wind Energy 101 Know the Facts" which included a project overview handout as well as corporate information and general information including a CD presentation on harnessing wind energy (see Appendix A). Attendees were encouraged to complete a feedback form prior to leaving the session. The session was informal and consisted of a series of poster storyboards and handouts which included information on:

- a map of the proposed project area with the latest turbine layout;
- specifications of the proposed wind turbines;
- information on the construction and installation process;
- project schedule;
- general information on noise;
- corporate information on the proponent; and
- information on the environmental assessment and regulatory approval process.

Copies of the information panels listed below (Table 7.1) and the exit questionnaire are included in Appendix A.

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Table 7.1 Information Panels Presented at the Open House

Public Open Houses	
▪ Corporate Information	▪ Potential Issues of Concern (e.g., birds and noise)
▪ Community Engagement Process	▪ Benefits of Wind Energy
▪ Project Description (including site maps)	▪ EIA Process and Key Valued Environmental Components
▪ Technical Information (including the basics of a wind turbine and typical construction activities)	▪ Visual Impact Montages
▪ Regulatory Approval Process	▪ Contact Information

Few issues of concern were raised by the general public at the open house (verbally or via the exit/feedback form). The written comments received during the public information session are summarized below in Table 7.2.

Table 7.2 Issues Raised at the November 17, 2008 Open House

Issue/ Comment	SkyPower Response
General Comments	
Thought it would be somebody speaking and answering	<p>The purpose of the community information session was to provide the most up-to-date information on the proposed project, as well as, to field any questions from the local community in an unrestricted atmosphere. The community information session process, as mandated by Federal Environmental Assessment, through the <i>Canadian Environmental Assessment Act</i>, was strictly followed and all of the priorities were met. The objective of the community information session is an opportunity to hear comments, support and concerns regarding the project in a proactive fashion. It is an opportunity to reach and instigate one-on-one dialogue with local residents.</p> <p>For any additional open houses in the area, we will take your suggestion into consideration.</p>
<p>Why windfarm in the middle of the community? Concerned about decommissioning.</p> <p>Not opposed to wind, opposed to way developed – not informed all along.</p>	<p>The area has a superior wind resource, close proximity to existing transportation infrastructure and community support for the Project.</p> <p>The land is immediately rehabilitated and brought back to previous conditions.</p> <p>SkyPower is committed to consulting with the community of Digby. To date, SkyPower representatives have introduced the proposed the Digby Wind Power Project to various parties, including participating landowners, neighbouring landowners, NSPI and the Digby municipal government representatives, and have received overwhelming support. We look forward to working with the entire community as our Project continues to develop.</p>
Would like information from residents living close to existing wind	There were residents present at the open house that

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Table 7.2 Issues Raised at the November 17, 2008 Open House

Issue/ Comment	SkyPower Response
<p>farms in Canada. How have these people adjusted? What benefits have there been to the local municipality?</p> <p>Have always been interested in Wind power.</p> <p>Need a forum where people can present their concerns.</p> <p>Bring ordinary citizens in from areas that have existing wind farms to answer the concerns re: strobe effect, noise pollution, set backs and benefits.</p>	<p>currently have turbines on their property in the Digby area. These residents were invited open house participants to their homes to view the turbines and answer any questions they may have.</p> <p>Wind farms provide a new tax revenue stream for local municipalities, which can be used for the benefit of all.</p> <p>Thank you for supporting wind power.</p> <p>For any additional open houses that we will have in the area, we will take your suggestions into consideration.</p>
<p>Good Presentation – What I expected. Lots of experts to answer questions</p>	<p>Thank you for your continued support on the Project.</p>
<p>Could talk to people involved with the project and ask a lot of questions.</p> <p>I think a session with a seated audience and a question period (one question at a time and a MC in charge) would be a great format for a session which would keep all attendees at the same level of information.</p>	<p>For any additional open houses in the area, we will take your suggestion into consideration.</p>
<p>Would like to see a sit down and listen to questions and answer.</p> <p>You should stress that David Suzuki is “pro” wind power – People see the name and believe! Some are uneducated and take what they hear from others who lived in cities as gospel and educated. When it is only a personal opinion, Educate and show them how long the meters are from here to a windmill-show them!</p>	<p>For any additional open houses in the area, we will take your suggestions into consideration.</p> <p>Thank you for your continued support on the Project.</p>
<p>This end of the province (Digby County) has shown such negativity on any new industry, progress, etc., for all the years (30) I have been here. I hope you succeed.</p>	<p>We look forward to working with the entire community as our Project continues to develop.</p> <p>Thank you for your continued support on the Project.</p>
<p>No final location of sites yet.</p> <p>Neutral at this point and support green energy.</p>	<p>The turbine layout for the Project will be finalized once we consult the municipality, the landowners and the community of Digby.</p> <p>Thank you for supporting green energy.</p>
<p>600 meters not far enough</p>	<p>Typically, rules and regulations in Canada and the United States say that separation distances (known as “setbacks”) for turbines from dwellings are approximately 500 to 600 metres. Generally, these are considered more than adequate setbacks for dwellings.</p>
<p>Are you going to move the one in the Gulliver’s Cove in the back of 600 meters further away from houses? Suggested 1.5 miles from homes.</p>	<p>The turbine layout for the project will be finalized once we consult the municipality, the landowners and the community of Digby.</p>

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Table 7.2 Issues Raised at the November 17, 2008 Open House

Issue/ Comment	SkyPower Response
	<p>Many local governments not only in Nova Scotia, but across Canada do not have specific wind planning and permitting protocols. Therefore, most local municipalities rely on “Best Practices” undertaken in other jurisdictions. These “Best Practices” are supported by the Canadian Wind Energy Association (CanWEA) (2007).</p> <p>Typically, rules and regulations in Canada and the United States say that separation distances (known as “setbacks”) for turbines from dwellings are approximately 500 to 600 metres (m). Generally, these are considered more than adequate setbacks for dwellings.</p>
Lights at night the first thing you see on the horizon	<p>CanWEA worked with Transport Canada and others (pilot association, Canadian Wildlife Service, etc) to develop standard that addressed wide range of concerns.</p> <p>As with all tall structures, turbines must be lit according to Transport Canada standards. Lighting has to provide sufficient warning to pilots, not attract birds, and not hinder night sky viewing.</p> <p>Current requirements are for single red flashing lights on turbines around the perimeter of the wind farm.</p>
Most of the communities long term residents are all for this project.	<p>Thank you for your continued support on the Project.</p> <p>We look forward to working with the entire community as our Project continues to develop.</p>
I am in support of this project. It will bring economic growth to the community, while also providing clean power.	<p>Thank you for supporting the Project.</p>

Additional stakeholder and community outreach initiatives are planned for the Spring and Summer of 2009 including the launch of a Project website, mailout of community newsletter, meeting with municipal council, door-to-door community outreach program and a public open house.

SkyPower will also develop and implement a community liaison and issues resolution program for Project construction and operation. This program will include company contacts as well as an issues resolution procedure for community members to identify issues of concern. The procedure will document the issue and action taken to resolve and/or improve the situation. The liaison program will also provide regular Project updates to community members and interested stakeholders through various methods (*i.e.*, website, mailouts, community meetings, *etc*).

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7.2 Municipal Planning Process

SkyPower representatives have consulted with the Municipality of the County of Digby on various occasions during Project planning including a presentation to council on November 10, 2008, prior to the public open house.

At the request of the Council, a Planning Advisory Committee (PAC) has drafted a proposed Municipal Planning Strategy (MPS) and Land Use Bylaw (LUB) for the Regulation of Wind Turbine Development in the Municipality of the District of Digby (Draft 2009). The MPS and LUB are currently undergoing public review and they have yet to be reviewed by Council for decision. To date, Council has given no indication of their position on the PAC proposal. Under the proposed MPS and LUB, a development permit may only be issued for a utility scale wind development if Council has entered into a development agreement with the developer. Council must hold a public hearing to obtain public input before Council can enter into an agreement. The development agreement must be in compliance with criteria presented in Policies 11 and 12, including but not limited to submission of a visual impact study, noise impact study and decommissioning and reclamation plans.

Under current municipality requirements, the Project requires a building permit from the municipality to proceed. In accordance with these requirements, and in the absence of a definitive timeframe for the adoption of the draft MPS/LUB proposed by the PAC, SkyPower submitted an application for a building permit in February 11, 2009, and the permit was subsequently issued on February 16, 2009. Since the building permit was issued prior to the Notice of Intent to Adopt Planning Documents (the MPS and LUB) was published, and with construction on the Project expected to commence within 12 months from the issuance of the building permit, the Project is a non-conforming structure and non-conforming land use under the *Municipal Government Act*. A non-conforming structure or non-conforming land use (*i.e.*, structure or land use that does not meet the applicable requirements of an MPS or LUB) may continue to exist even though they do not meet the requirements contained in the Planning Documents. It is worth noting that the studies and plans referenced as requirements in the draft MPS and LUB are being conducted as part of the provincial/federal approval process for the Project, therefore the Project will essentially meet the intentions of the draft MPS/LUB.

7.3 Regulatory Consultation

Various regulatory and other agencies were consulted early in the planning process to provide input into the Project and the process, and advice in terms of likely approvals and considerations for environmental assessment.

To date, the following agencies have been contacted by SkyPower and/or the Jacques Whitford Stantec Limited Study Team:

- CEA Agency;
- CWS;
- NSE;
- NS Aboriginal Affairs;
- NSDNR; and
- NRCan.

With respect to federal coordination, a project initiation meeting was held at the CEA Agency on November 6, 2008. To date, the Project has one known trigger under *CEAA* due to the application for federal funding under NRCan's ecoEnergy for Renewable Power (EERP) program. This process has been started for the Project with the Notice Project Application (Step 1), as approved by NRCan on September 7, 2007; the ecoENERGY Registration Number for this Project is #5911-S17-2. Under the new Terms and Conditions of this EERP, NRCan will be identified as a "Responsible Authority" (RA) for the Project once Step 2 (the Technical Project Information (TPI) package has been submitted and approved and a Contribution Agreement has been fully

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executed. It is currently unknown if other federal agencies such as Environment Canada, Transport Canada, Health Canada and Department of Fisheries and Oceans have an interest either as a RA or expert department in the review of the Project under *CEAA*; however there are no obvious *CEAA* triggers besides the federal funding.

A draft environmental assessment was submitted for regulatory review and comment and distributed by NSE to relevant provincial and federal agencies. Comments received were taken into consideration in preparing the final EA Registration document. SkyPower will continue to work regulatory agencies to develop appropriate follow-up measures (*e.g.*, post-construction monitoring) and submit applicable permit applications.

7.4 First Nation and Aboriginal Engagement

The Project site consists of privately held land used primarily for forestry and residential uses; there is no known traditional use by First Nation people. Letters containing general project details were sent to the Confederacy of Mainland Mi'kmaq (CMM), the Assembly of Nova Scotia Chiefs, Annapolis Valley First Nations and Bear River First Nations in November of 2008 to solicit comments or concerns. In addition, there have been ongoing discussion between SkyPower and Bear River First Nation.

In February 2009 SkyPower commissioned an MEKS for the Project. The MEKS will identify land and resource use which is of particular importance to the Mi'kmaq people with respect to the Digby Wind Power Project and will also seek to identify and document ecological knowledge which may be significant to the Project. It is anticipated that preliminary results will be available in May and July with the final report completed in September 2009. Results of the MEKS will be provided to NSE and the KMK as they become available.

On April 3, 2009, SkyPower attended, an informal session with NSE, Aboriginal Affairs and representatives from the Mi'kmaq Rights Initiative (KMK). This meeting allowed SkyPower to provide an overview of the Project and obtain feedback on issues scoping relative to Aboriginal issues. First Nation and Aboriginal communities will also be invited to review and comment on the EA report during the EA registration process.

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Conclusion

8 CONCLUSION

The Digby Wind Power Project is expected to provide clean energy for more than 10,000 homes annually in the Digby area. The Project will result in displacement of burning fossil fuel with an expected avoidance of greenhouse gas emissions of approximately 66,000 tonnes of carbon dioxide, as well as tonnes of sulphur dioxide and nitrogen oxide. The Digby Wind Power Project will therefore be an important component of Nova Scotia's commitment to renewable energy and reduction of air emissions from energy combustion.

Based on the results of this EA, the study team has concluded that the Digby Wind Power Project is unlikely to cause significant adverse residual environmental effects. The following section summarizes key points from the EA in justification of this conclusion.

The Project will result in physical disturbance of approximately 52 ha of land including development of access roads, turbine foundations and substation construction. This represents approximately 4.5% of the total Project Area, much of which has been previously disturbed (*e.g.*, forestry activities). Existing logging roads will be upgraded and used for turbine access. Sensitive features including watercourses, wetlands, plant species of conservation of concern, and areas of high archaeological potential will be avoided to the greatest extent practical or possible. Where avoidance is not practical nor possible, detailed mitigation will be developed and all required permits will be obtained prior to construction. Follow-up surveys will be conducted if necessary at areas to be disturbed based on final design which will allow for precise mitigation planning to minimize localized environmental effects on sensitive habitats.

Installation of the proposed Digby Wind Power Project will be completed in approximately 9 months of on-site work limiting the period of potential disturbance to residents and wildlife associated with increased vehicle traffic and human activity. Construction activities will be scheduled where practical to minimize environmental effects (*i.e.*, to prevent rutting and to avoid significant life history events such as breeding season for most bird species). Remediation of disturbed surface areas will be undertaken as soon as possible after construction is complete, and the conditions of affected land will be remediated to approximate pre-construction conditions in accordance with landowner agreements. The residual environmental effects associated with Project construction are therefore predicted to be **minimal and not significant**.

Effects associated with Project operation are also predicted to be **minimal and not significant**. Operation of the wind farm will result in minimal adverse effects to birds and other wildlife. While turbines present a potential collision hazard to birds and bats, this is fairly low relative to other tall structures. Bird and bat collisions are expected to be infrequent considering the topography of the area, observed flying patterns, distribution of habitat, and low collision rates documented at other wind farms in the United States and Canada. Post-construction monitoring will be conducted in consultation with Environment Canada and NSDNR. This information will be used for future planning and develop mitigation if required. Any other disturbances to birds and other wildlife (*e.g.*, sensory disturbance) will be minimal, of short duration, reversible and on a local scale.

Operation of the facility will not result in production of air emissions. Sound levels and visual effects (*e.g.*, shadow flicker) will be within acceptable standards. The visual landscape of the region will be altered by the presence of wind turbines; while some receptors will have a clear view of the turbines, many of the homes close to the viewshed will be unable to see the wind farm due to topography and forest cover. Screening opportunities through tree planting or other measures will not likely be warranted but may be considered where post-construction assessment indicates a legitimate concern.

Existing land use (*i.e.*, residential, recreational, resource use) can continue during operation of the Project. A number of positive effects will also be realized. Landowners who are leasing their land for the Project will receive direct financial benefits from facility installation and operation, and the county will receive substantial revenue through property taxes, which will benefit county residents in turn. The Project will offer employment and revenue to local workers, and tourism may actually increase as a result of the operation of the wind farm.

Appropriate and effective mitigation measures have been recommended for the proposed Digby Wind Power Project to eliminate or minimize effects that may have been associated with the development. Any residual net adverse environmental effects are predicted to be **not significant** based on the results and conclusions of this EA.

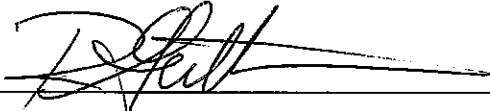
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Signature

9 SIGNATURE

This report presents details on the EA of the proposed Digby Wind Project, conducted in accordance the *Canadian Environmental Assessment Act*, following the "Environmental Impact Statement Guidelines for Screenings of Inland Wind Farms Under the *Canadian Environmental Assessment Act*" (NRCan 2003). "The Proponent's Guide to Wind Power Projects: Guide to Preparing an Environmental Assessment Registration Document" (NSEL 2007, updated 2008) was used to satisfy the requirements of provincial registration. Overall, the residual effects of the project are not significant and are acceptable, based on a balanced assessment against all of the screening criteria and the results and conclusions of the EA.

This EA was completed for SkyPower by Jacques Whitford Stantec Limited. The names and credentials (CVs) of all primary and secondary investigators are presented in Appendix G. Specifically, and on behalf of SkyPower and Jacques Whitford Stantec Limited, the report was prepared and reviewed by the following:



Richard Guttman

Vice President and General Counsel, SkyPower Corp.



Heather Giddens, MES

Project Manager, Jacques Whitford Stantec Limited

10 REFERENCES**10.1 Literature Cited**

- Atlantic Canada Conservation Data Centre (ACDC). 2008. Data request for uncommon and rare species in the vicinity of Gulliver's Cove, Nova Scotia.
- Baerwald, E.F., G.H. D'Amours, B.J. Klug, and R.M.R. Barclay. 2008. Barotrauma is a significant cause of bat fatalities at wind turbines. *Current Biology*. Vol. 18 (16):R695-R696.
- Banfield, A.W.F. 1974. *The Mammals of Canada*. University of Toronto Press. Toronto, Ontario.
- Bat Conservation International. 2001. Bats in Eastern Woodlands. Bat Conservation International. Available online at: <http://www.batcon.org/nabcp/newsite/forrep.pdf>.
- Broders, H.G. and G.J. Forbes. 2004. Interspecific and intersexual variation in roost-site selection of northern long-eared and little brown bats in the Greater Fundy National Park Ecosystem. *The Journal of Wildlife Management* 68(3): 602-610.
- Broders, H.G., D.F. McAlpine, and G.J. Forbes. 2001. Status of the eastern pipistrelle (*Pipistrellus subflavus*) (Chiroptera: Vespertilionidae) in New Brunswick. *Northeastern Naturalist* 8:331-336.
- Broders, H.G., G.M. Quinn and G.J. Forbes. 2003. Species status, and the spatial and temporal patterns of activity of bats in southwest Nova Scotia, Canada. *Northeastern Naturalist* 10(4): 383-398.
- Brown, W.K., and B.L. Hamilton. 2002. Bird and Bat Interactions with Wind Turbines, Castle River Wind Farm, Alberta. Report prepared for Vision Quest, March 2002.
- Canadian Environmental Assessment Agency. 1999. *Cumulative Effects Assessment Practitioners Guide*.
- Canadian Renewable Energy Corp. 2007. Wolfe Island Wind Project Environmental Review Report. Prepared by Stantec Consulting Ltd. November 2007.
- Canadian Wind Energy Association (CanWEA). 2007. Position on Setbacks for Large-Scale Wind Turbines in Rural Areas (MOE Class 3) in Ontario". September 28, 2007.
- Canadian Wind Energy Association (CanWEA). 2006. North Cape Wind Farm. Available online at: http://canwea.ca/images/uploads/File/North_Cape2.pdf
- Canadian Wind Energy Association (CanWEA). 2001. Ontario Wind Power Task Force Industry Report and Recommendations. Available at: <http://www.canwea.ca/images/uploads/File/Resources/OntarioWindPowerTaskForceReport.pdf>
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2008. COSEWIC assessment and status report on the Canada Warbler *Wilsonia Canadensis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 35 pp. (www.sararegistry.gc.ca/status/status_e.cfm).
- Crawford, R.L., and R.T. Engstrom. 2001. Characteristics of avian mortality at a north Florida television tower: a 28-year experience. Tall Timbers Research Station, Tallahassee, Florida.
- Crockford, N.J., 1992. A review of the possible impacts of wind farms on birds and other wildlife. Joint Nature Conservation Committee, JNCC report no. 27, Peterborough, United Kingdom.
- Davis, D and S. Browne. 1996. *The Natural History of Nova Scotia*. Nimbus Publishing and the Nova Scotia Museum.

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References

- Dawson, J. 1988. *The Mapmaker's Eye: Nova Scotia through early maps*. Halifax: Nimbus Publishing Ltd.
- Dunn, E. H. 1993. Bird mortality from striking residential windows in winter. *Journal of Field Ornithology* 64(3): 302-309.
- ECONorthwest. 2002. Economic Impacts of Wind Power in Kittitas County. Final Report for the Phoenix Economic Development Group, November 2002.
- Environment Canada. 2007a. Wind Turbines and Birds - A Guidance Document for Environmental Assessment. Available online at: http://www.cws-scf.ec.gc.ca/publications/eval/index_e.cfm. Last accessed January 21, 2008.
- Environment Canada. 2007b. Recommended Protocols for Monitoring Impacts of Wind Turbines on Birds. Available online at: http://www.cws-scf.ec.gc.ca/publications/eval/index_e.cfm.
- Environment Canada. 2004. Wind Turbines and Birds: A Guidance Document for Environmental Assessment. Interim Draft.
- Epilepsy Action. 2007. Photosensitive epilepsy. Available online at: <http://www.epilepsy.org.uk/info/photo.html>.
- Erickson 2003. Updated information regarding bird and bat mortality and risk at new generation wind projects in the West and Midwest. Presentation at the National Wind Coordinating Committee meeting, "How Is Biological Significance Determined When Assessing Possible Impacts?", Washington, D.C., November 17-18, 2003.
- Erickson, W.P., B. Gritski, and K. Kronner, 2003. Nine Canyon Wind Power Project Avian and Bat Monitoring Annual Report. Technical report submitted to Energy Northwest and the Nine Canyon Technical Advisory Committee.
- Erickson, W., G.Johnson, D.Young, D.Strickland, R.Good, M.Bourassa and K.Bay. 2002. Synthesis and Comparison of Baseline Avian and Bat Use, Raptor Nesting and Mortality Information from Proposed and Existing Wind Developments. Report prepared for Bonneville Power Administration, Portland, Oregon. 96 pp.
- Erickson, W.P., G.D. Johnson, M.D. Strickland, and K. Kronner. 2000. Avian and bat mortality associated with the Vansycle wind project, Umatilla County, Oregon, 1999 study year. Technical report prepared for the Umatilla County Department of Resource Services and Development, Pendleton, Oregon.
- Erickson, W.P., G.D. Johnson, M.D. Strickland, D.P.Young, Jr., K.J.Sernka and R.E.Good. 2001. Avian collisions with wind turbines: A summary of existing studies and comparisons to other sources of avian collision mortality in the United States. Report prepared for National Wind Coordinating Committee, August 2001.
- Erskine, A.J. 1992 Atlas of breeding birds of the Maritime Provinces. Nimbus Publ. and N.S. Museum, 270 pp.
- Erskine, A.J., R.J. McManus. 2005. Bird status changes – and changes in environment – in the Chignecto Isthmus region of Atlantic Canada, Technical Report Series Number 430, Atlantic Region Canadian Wildlife Service Environment Conservation Branch.
- Finnish Meteorological Institute. 2000. Cited in: Stantec, 2005. Melancthon Grey Wind Project Environmental Screening Report.
- Fisheries and Oceans Canada (DFO). 1998. Habitat Conservation and Protection Guidelines, Second Edition. Developed from the Policy for the Management of Fish Habitat (1986). Available online at <http://www.dfo-mpo.gc.ca/Library/240756.htm>

DIGBY WIND POWER PROJECT ENVIRONMENTAL ASSESSMENT

References

- Fisheries and Oceans Canada (DFO). 1986. Policy for the Management of Fish Habitat. Available Online: http://www.dfo-mpo.gc.ca/canwaters-eauxcan/infocentre/legislation-lois/policies/fhm-policy/index_e.asp
- Gilhen, J. 1984. Amphibians and Reptiles of Nova Scotia. Nova Scotia Museum, Halifax, NS 162 pp.
- Gilhen, J. and F. Scott. 1981. Distributions, habitats and vulnerability of amphibians, reptiles, and small native mammals in Nova Scotia. Curatorial Report Number 45. Nova Scotia Museum. Halifax, NS.
- Gill, J.P., M. Townsley, and G.P. Mudge. 1996. Review of the impacts of wind farms and other aerial structures upon birds. Scottish Natural Heritage Review. No. 21.
- Gruver, J.C. 2002. Assessment of bat community structure and roosting habitat preferences for the hoary bat (*Lasiurus cinereus*) near Foote Creek Rim, Wisconsin, M.S. thesis, University of Wyoming, Laramie. 149 pp.
- Hall, L.S. and G.C. Richards. 1972. Notes on *Tadarida australis* (Chiroptera: Molossidae). Australian Mammalogy 1:46.
- Harding, G., P. Harding, and A. Wilkins. 2008. Wind turbines, flicker and photosensitive epilepsy: characterizing the flashing that may precipitate seizures and optimizing guidelines to prevent them. *Epilepsia* 49(6):1095-1098.
- Health Canada. 2006. Guidelines for Canadian Drinking Water Quality.
- HGC Engineering. 2006. Wind turbines and infrasound. Submitted to: Canadian Wind Energy Association (CanWEA). November 29, 2006. 14 pp.
- Howe, R.W., W. Evans, and A.T. Wolf. 2002. Effects of wind turbines on birds and bats in northeastern Wisconsin. Report to Wisconsin Public Service Corporation and Madison Gas and Electric Company, Madison, WI.
- James, R.D. 2003. Bird observations at the Pickering wind turbine. *Ontario Birds* 21: 84-97.
- James, R.D., and G. Coady. 2003. Exhibition Place Wind Turbine Bird Monitoring Program in 2003. Report to Toronto Hydro Energy Services Inc. and Windshare, December 2003.
- Johnson, G.D., W.P. Erickson, and J. White. 2003. Avian and bat mortality at the Klondike, Oregon Phase I Wind Plant. Technical report prepared for Northwestern Wind Power by WEST, Inc.
- Johnson, G.D., W.P. Erickson, D.A. Shepherd, M. Perlik, M.D. Strickland, and C. Nations. 2002. Bat interactions with wind turbines at the Buffalo Ridge, Minnesota, Wind Resource Area: 2001 field season. Electric Power Research Institute, Palo Alto, California.
- Johnson, G.D., W.P. Erickson, M.D. Strickland, M.F. Shepherd and D.A. Shepherd. 2000. Avian Monitoring Studies at the Buffalo Ridge Wind Resource Area, Minnesota: Results of a 4-year study. Technical report prepared for Northern States Power Co., Minneapolis, MN. 212pp.
- Jones, C., K.M. Somers, B. Craig, and T.B. Reynoldson. 2005. Ontario Benthos Biomonitoring Network (OBBN) Protocol Manual. Ontario Ministry of Environment Canada and Acadia Centre for Estuarine Research. 111 pp
- Jones, J. and C.M Francis. 2003. The effects of light characteristics on avian mortality at lighthouses. *Journal of Avian Biology* 34 (4), 328–333.
- Jung, T., I. Thompson, R. Titman, and A. Applejohn. 1999. Habitat selection by forest bats in relation to mixed-wood stand types and structure in central Ontario. *Journal of Wildlife Management* 63:1306-1319.

DIGBY WIND POWER PROJECT ENVIRONMENTAL ASSESSMENT

References

- Keppie, J.D. 2000. Geological Map of the Province of Nova Scotia, scale 1:500 000, Digital Version of Nova Scotia Department of Natural Resources Map ME 2000-1. Digital product compiled by B.E. Fisher. (Formerly DP ME D00-01)
- Kerlinger, P. 2003. FAA lighting of wind turbines and bird collisions. Presentation at the National Wind Coordinating Committee meeting, "How Is Biological Significance Determined When Assessing Possible Impacts?", Washington, D.C., November 17-18, 2003.
- Kerlinger, P. 2000. Avian mortality at communication towers: a review of recent literature, research and methodology. Prepared for the U.S. Fish and Wildlife Service, Office of Migratory Bird Management.
- Kingsley, A., and B.Whittam. 2005. Wind Turbines and Birds: A Background Review for Environmental Assessment. Draft. Document prepared by Bird Studies Canada for Canadian Wildlife Service, Environment Canada, May 2005.
- Koehler, C.E. and R.M.R. Barclay. 2000. Post-natal growth and breeding biology of the hoary bat (*Lasiurus cinereus*). *Journal of Mammalogy* 81:234-244.
- Lindsay, J., and M.Kearns 2003. Mountaineer Bats. Presentation at the National Wind Coordinating Committee meeting, "How Is Biological Significance Determined When Assessing Possible Impacts?", Washington, D.C., November 17-18, 2003.
- Millikin, R.L. 2005. Phase 3 Final Report for the Wind Consortium. Report prepared for Suncor Energy Products Inc., Vision Quest Windelectric, Canadian Hydro Developers Inc., Enbridge Wind Power Canada Inc., and Natural Resources Canada.
- MORI Scotland. 2002. Tourist Attitudes towards Wind Farms. Research study conducted for Scottish Renewables Forum and the British Wind Energy Association. Summary Report. September 2002.
- Municipality of Digby. 2008. The Municipality of Digby Municipal Planning Strategy: Concerning the Establishment of Residential Livestock Areas. Available online at: <http://www.municipalities.com/digby/bylaws/drafts/RLAMPS2008.pdf>
- National Institute of Environmental Health Sciences. 2002. EMF – Electric and Magnetic Fields Associated with the Use of Electric Power. Questions and Answers. Prepared for the NIEHS/DOE EMF RAPID Program, June 2002.
- Natural Resources Canada. 2003. Environmental Impact Statement Guidelines for Screenings of Inland Wind Farms Under the *Canadian Environmental Assessment Act*.
- Nicholson, C.P. 2003. Buffalo Mountain Windfarm bird and bat mortality monitoring report: October 2001-September 2002. Tennessee Valley Authority, Knoxville, Tennessee.
- Nova Scotia Department of Natural Resources (NSDNR). 2007. General Status Ranks of Wild Species in Nova Scotia. Available online at: <http://www.gov.ns.ca/natr/wildlife/genstatus/>
- Nova Scotia Department of Tourism, Culture and Heritage. 2008a. Provincial Visitor Information Centres: Visitors Counselling, 2004-2007. Available online at: <http://www.gov.ns.ca/tch/pubs/insights/AbsPage.aspx?ID=1241&siteid=1&lang=1>
- Nova Scotia Department of Tourism, Culture and Heritage. 2008b. Tourism Industry Profile, Economic Impact by County. Available online at: <http://www.gov.ns.ca/tch/pubs/insights/AbsPage.aspx?id=1234&siteid=1&lang=1>
- Nova Scotia Environment Pumping Test Inventory; NSE 1973-2008.
- Nova Scotia Environment Well Drillers Logs (1965-2007).

DIGBY WIND POWER PROJECT ENVIRONMENTAL ASSESSMENT

References

- Nova Scotia Environment and Labour (NSEL). 2007. Proponents Guide to Wind Power Projects: Guide to Preparing an Environmental Assessment Registration Document. Available online at: <http://www.gov.ns.ca/enla/ea/docs/EAGuideWindPower.pdf>.
- Nova Scotia Environment and Labour (NSEL). 2006a. Wetland Designation Policy.
- Nova Scotia Environment and Labour (NSEL). 2006b. Operational Bulletin Respecting the Alteration of Wetlands.
- Nova Scotia Environment and Labour (NSEL). 1940-2004. Well Driller Logs.
- Nova Scotia Museum of Natural History (1996). Freshwater fishes. In Natural history of Nova Scotia (Rev. ed., Vol.1, chap. T11.13). Accessed December 2008, from <http://museum.gov.ns.ca/mnh/nature/nhns/t11/t11-13.pdf>
- Ontario Ministry of the Environment (MOE). 2004. Interpretation for Applying MOE Technical Publications to Wind Turbines.
- Ontario Ministry of the Environment (MOE). 1995. Sound Level Limits for Stationary Sources in Class 1 & 2 Areas (Urban). Publication NPC-205
- Orloff, S., and A. Flannery. 1992. Wind turbine effects on avian activity, habitat use and mortality in Altamont Pass and Solano County wind resource areas, 1989-1991. Prepared by BioSystems Analysis, Inc. Tiburon, California. Prepared for the California Energy Commission, Sacramento, Grant 990-89-003.
- Percival, S.M. 2001. Assessment of the effects of offshore wind farms on birds. Report ETSU W/13/00565/REP, DTI/Pub URN 01/1434.
- Province of Nova Scotia. 2009. Place Names of Nova Scotia. Public Archives of Nova Scotia. Internet publication: <http://www.gov.ns.ca/nsarm/cap/places/>. Updated June 9, 2004.
- Renewable Energy Policy Project (REPP). 2003. The Effect of Wind Development on Local Property Values. Available online at: http://www.crest.org/articles/static/1/binaries/wind_online_final.pdf.
- Reynoldson, T.B., C. Logan, T. Pascoe, and S.P. Thompson (accessed via the web-site: http://cabin.cciw.ca/Main/cabin_online_resources.asp?Lang-en.ca, June 2007). CABIN (Canadian Aquatic Biomonitoring Network) Invertebrate Biomonitoring Field and Laboratory Manual. Environment Canada. 47 pp.
- Ryan, R.J., Boehner, R.C., Deal, D., and Calder, J.H. 1990. Cumberland Basin Geology Map, Amherst, Springhill and Parrsboro Cumberland County. Nova Scotia Department of Mines and Energy. Map 90-12. Scale 1:50,000.
- Scott, F.W. 1994. Provisional annotated list of plant and animal species considered to be rare in Nova Scotia. Nova Scotia Museum of Natural History, Halifax, NS. 12 pp.
- Scott, W.B. and E.J. Crossman 1998. Freshwater Fishes of Canada. Galt House Publications Ltd, Oakville. 966 pp.
- Statistics Canada. 2008a. 2006 Community Profiles. Available online at: <http://www12.statcan.ca/english/census06/data/profiles/community/Details/Page.cfm?Lang=E&Geo1=C&D&Code1=1203&Geo2=PR&Code2=12&Data=Count&SearchText=digby&SearchType=Begins&SearchPR=12&B1=All&Custom>
- Statistics Canada. 2008b. 1996 Community Profiles. Available online at: <http://www12.statcan.ca/english/profil/Details/details1inc.cfm?SEARCH=BEGINS&PSGC=12&SGC=120>

DIGBY WIND POWER PROJECT ENVIRONMENTAL ASSESSMENT

References

[3004&A=&LANG=E&Province=12&PlaceName=digby&CSDNAME=Digby&CMA=0&SEARCH=BEGINS
&DataType=1&TypeNameE=Municipal%20District&ID=2269](http://www.municipal.ca/3004&A=&LANG=E&Province=12&PlaceName=digby&CSDNAME=Digby&CMA=0&SEARCH=BEGINS&DataType=1&TypeNameE=Municipal%20District&ID=2269)

- Stea, R.R., Conley, H., and Brown, Y. (compilers). 1992. Surficial Geology of the Province of Nova Scotia. Nova Scotia Department of Natural Resources, Map 92-3, Scale 1:500000.
- Sterzinger, G., F.Beck and D.Kostiuk. 2003. The Effect of Wind Development on Local Property Values. Report for the Renewable Energy Policy Project, May 2003.
- Strickland, D., and W. Erickson. 2003. Overview of non-collision related impacts from wind power projects. Presentation at the National Wind Coordinating Committee meeting, Wildlife Workgroup Strategy Session, Aurora, Colorado, April 23, 2003.
- Timm, R.M. 1989. Migration and molt patterns of red bats. Illinois Bulletin Chicago Academy of Science.
- Town of Digby. 2008. Town of Digby Website. Available online at <http://www.townofdigby.ns.ca/>.
- U.S. Department of Energy. 2004. Wind Energy for Rural Economic Development. Available online at <http://www.nrel.gov/docs/fy04osti/33590.pdf>.
- Young, D.P. Jr., Johnson, G.D., W.P. Erickson, M.D. Strickland, R.E. Good and P.Becker. 2001. Avian and bat mortality associated with the initial phase of the Foote Creek Rim Windpower Project, Carbon County, Wyoming: November 3, 1998 – October 31, 2000. Tech. Report prepared by WEST, Inc. for SeaWest Energy Corporation and Bureau of Land Management. 32pp.
- Zinn, T.L. and W.W. Baker. 1979. Seasonal migration of the hoary bat, *Lasiurus cinereus* through Florida. Journal of Mammalogy 60: 634-635.

10.2 Personal Communications

- Dr. Hugh Broders. 2008. Biology Department, Associate Professor, St. Mary's University.
- Lance Laviolette. 2009. Brier Island Bird Migration Research Station.
- Peter MacDonald. 2009. Wildlife Biologist, Western Region. Nova Scotia Department of Natural Resources.

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11 APPENDICES

Appendix A Public Consultation Materials

Appendix B Aquatic Survey Photographs

Appendix C Flora Lists

Appendix D Wetland Data

Appendix E Avian Field Program Information

Appendix F Noise Impact Study

Appendix G CVs of Study Team Members