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***TECHNICAL REVIEW COMMENTS  
on the Environmental Impact Statement***

***Chaplin Wind Energy Project***

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## Acronyms

the Act	<i>The Environmental Assessment Act</i> (Saskatchewan)
ARG	Saskatchewan Activity Restriction Guidelines for Sensitive Species
DTC	Crown's duty to consult
EAB	Environmental Assessment Branch
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
HRIA	Heritage Resource Impact Assessment
IBA	Important Bird Area
the ministry	Saskatchewan Ministry of Environment
the Minister	Saskatchewan Minister of the Environment
NCC	Nature Conservancy of Canada
the project	Chaplin Wind Energy Project
ROW	right-of-way
SEARP	Saskatchewan Environmental Assessment Review Panel (technical reviewers)
TRC	Technical Review Comments
TOR	Terms of Reference
WHSRN	Western Hemisphere Shorebird Reserve Network
WTGs	wind turbine generators

## Preface

This document is provided by the Environmental Assessment Branch (EAB) of the Saskatchewan Ministry of Environment (the ministry) as supporting information for the public review of the Windlectric Inc. (a subsidiary of Algonquin Power Co.) environmental impact statement (EIS) for the proposed Chaplin Wind Energy Project (the project). Windlectric is proposing to construct and operate a 177 megawatt (MW) wind power facility over 19,000 hectares (ha) located approximately 4 km north of the Village of Chaplin, Saskatchewan in the Rural Municipality (RM) of Chaplin No. 164. The disturbance required for construction of the project would be approximately 144 ha (62 ha on native grasslands and 82 ha on previously disturbed land). The proposed project was chosen by SaskPower to enter into a 25-year Power Purchase Agreement with the utility to provide an additional 177 MW of wind energy to SaskPower's integrated grid.

The proposed project will include a maximum of 79 wind turbine generators (WTGs), with the final number of turbines depending on the selection of the WTG model and manufacturer. The project will also include supporting infrastructure including access roads, an underground fibre-optic communications network, an operations and maintenance building, an electrical collection system for the generated power, and a new 34.5-kilovolt (kV) to 138-kV substation.

This document has four major sections, with the first section providing an overview of the provincial environmental assessment and review process. It outlines the events and activities that led to the EIS being released for public review and describes how the public can provide comments to the Minister of the Environment (the Minister) on the proposed project.

The second section provides a brief summary of the project. This summary is intended to provide information to assist the reader in deciding whether they are interested in finding out more about the project. It is not intended to be a full representation of the project. Interested readers should visit a review centre (locations are listed in section 4) to read the EIS for the project.

The third section of the document provides the ministry's evaluation of the proponent's conclusions regarding the predicted impacts of the proposed project, the effectiveness of any identified mitigative measures and any follow-up requirements that would be placed on the proponent by the Minister, should the project be approved.

The fourth section presents the conclusions reached by the ministry and invites the public to comment. The Minister, when making the final decision regarding the environmental acceptability of the proposed project, considers both the public's comments and Technical Review Comments (TRC).

# 1. Environmental Assessment and Review Process

## Introduction

*The Environmental Assessment Act* (the Act) in Saskatchewan requires the proponent of a “development” to conduct an environmental impact assessment (EIA). The EIA provides information needed by the Minister responsible for the Act (Minister of Environment) to determine whether, from an environmental perspective, a proposed development should be allowed to proceed and, if so, under what conditions.

As part of the environmental assessment process, the proponent is required to prepare an EIS that documents the proponent’s assessment and conclusions on the potential environmental effects of the proposed project. The EIS also describes the measures the proponent plans to take to reduce negative environmental effects and enhance positive impacts. Once completed, the EIS undergoes both a technical and public review prior to a decision being made by the Minister regarding the project.

The EIA review process provides a broad understanding of the potential impacts and ways to minimize the impacts of a Project.

The purpose of the environmental assessment and review process is to ensure that adequate environmental safeguards are in place before a development is allowed to proceed and that developments proceed in a manner understood and broadly accepted by the public. These environmental safeguards may arise out of the actual design and nature of the proposed development or, should the development receive approval under the Act, as a result of ongoing regulatory involvement by government agencies.

In addition to the Act, this project may be subject to the following Acts:

- *The Environmental Management and Protection Act, 2010*
- *The Heritage Property Act*
- *The Wildlife Act, 1998*
- *The Weed Control Act, 2010*
- *Migratory Birds Convention Act, 1994*
- *Species at Risk Act, 2002*

Other provincial and federal agencies also have legislation and regulations that may be applicable to the project.

## Submission of the Environmental Impact Statement

In July 2013, the EAB received a proposal for the Chaplin Wind Energy Project. On December 20, 2013 the proponent provided an addendum to the proposal that further defined the project location and proposed layout.

The proposal underwent screening to determine whether or not the project was a development under the Act which included a technical review by the Saskatchewan Environmental Assessment Review Panel (SEARP). Following technical review of the proposal, the project was determined to be a development under section 2(d) of the Act due to the large footprint and potential impacts to native grasslands, rare species and migratory birds. Windlectric Inc. (Windlectric) was advised on March 19, 2014 that the project is a development and an EIA was required, with findings of the EIA to be detailed in an EIS for submission to the ministry for review.

Subsequent to public notification of the EIA during the week of April 12, 2014, the proponent submitted a Terms of Reference (TOR). The TOR outlined specific studies that would be conducted to obtain information on the potential impacts of the project and documented in the EIS. The TOR was reviewed by SEARP and was accepted as final on September 17, 2014.

## Technical Review

Technical review provides the government perspective on the proposed development.

The draft EIS was received in March 2015 and reviewed by provincial technical reviewers to ensure that potential environmental issues (including biophysical, social and economic) had been identified and adequately addressed. The technical review identified several environmental and technical issues that required revisions and additional clarification before the EIA process could proceed to the public review phase. Following revisions of the draft EIS, a revised EIS was prepared by Windlectric to address deficiencies identified. This revised EIS containing responses to all requested information was provided to the ministry in September 2015 and upon further review was judged to contain adequate information to proceed with public review.

This TRC document has been prepared pursuant to section 11 of the Act, and is meant to assist the public and government decision-makers in their review by summarizing the information within the EIS and the comments received from SEARP. In preparing the TRC document, the ministry focuses on those factors that are considered to be of primary environmental significance with respect to the proposed project.

## Public Review

The public is invited to comment on the Chaplin Wind Energy EIS for a 30 day period ending November 17, 2015.

Pursuant to section 12 of the Act, both the EIS and TRC are made available for public inspection for a period of not less than 30 days. During the review period, members of the public may make written submissions to the ministry regarding the EIA and information provided in the EIS and associated documents. Interested readers should visit a review centre (locations are listed in section 4), or the ministry website ([saskatchewan.ca/environmentalassessment](http://saskatchewan.ca/environmentalassessment)) to review the EIS for the project.

## Ministerial Decision

The Minister considers both the public and technical review comments when making a decision

Information generated during the public and technical reviews of the EIS will be submitted to the Minister of Environment for consideration. The Minister, under section 15 of the Act, may give Ministerial Approval to proceed with the development, with any terms and conditions that the Minister considers necessary or advisable, or the Minister may refuse to approve the development as proposed and will provide reasons for the decision.

## 2. Summary of Proposed Project and EIS

Information in this section is taken from the project EIS and is neither comprehensive nor inclusive of the information contained in that document. Please refer to the Executive Summary and the EIS main document and annexes for complete information. Section 2.0 of the EIS provides detailed information regarding the project as it was originally proposed. The proposed number and layout of WTGs has changed over the course of the project with an updated layout included as Appendix L. Additional details regarding the environmental baseline studies including avian surveys can be found in Section 6.0, as well as in Appendix D of the EIS. Information on potential effects on wildlife and wildlife habitat can be found in section 6.2 of the EIS with additional bird and bat mortality risk assessments in Appendix K of the EIS. Details of planned mitigation that would be included as a part of the project are found in Appendices B and J.

Windlectric is proposing to construct and operate a wind-power facility over 19,000 hectares (ha.) north of the Village of Chaplin and approximately 155 km west of Regina. The project would be located primarily in the RM of Chaplin No. 164 on agricultural land and native prairie. Total disturbance for the project (including temporary and permanent disturbance) would be approximately 144 ha (62 ha on native grasslands and 82 ha on previously disturbed agricultural land). The project would be located between several

Important Bird Areas (IBAs) which provide staging and nesting grounds for migratory shorebirds and waterfowl. Chaplin Lake, which is part of a system designated as a Western Hemisphere Shorebird Reserve Network (WHSRN) site, is located 4.5 km south of the nearest proposed WTG and Paysen, Williams and Kettlehut lakes are located approximately 6 km north of the nearest proposed WTG.

The project would consist of a maximum of 79 WTGs, permanent access roads, temporary laydown work spaces, an electrical collection system for the generated power (including overhead collector lines along RM road allowances and an underground electrical collector system) a fiber-optic communications network, an operations and maintenance building, meteorological towers, and a new 34.5-kilovolt (kV):138-kV substation. WTGs would be spaced a minimum distance of 430 m apart with most turbines being spaced between 500 and 800 m apart.

When the EIS was initially prepared, the proponent proposed 88 WTGs. Figures and calculations in the EIS represent a scenario of environmental effects where 88 of the largest possible WTGs are assessed. This scenario would not occur, but has been used as a way to represent the maximum potential environmental effects in order to be conservative. Throughout the EIA process the number and locations of proposed turbines has been modified to avoid sensitive environmental features. As initially proposed in the draft EIS, the project layout would have consisted of 88 WTGs and associated infrastructure (Figure 2.1). In order to avoid known Ferruginous Hawk nests and heritage resources, several turbines were removed from the design and as currently proposed, the project would consist of a maximum of 79 turbines (Appendix L). In addition, the conceptual site layout was refined to avoid or minimize impacts to native grasslands to the extent possible. If a larger model of turbine is selected during design finalization, there would be less than 79 WTGs constructed which may influence final turbine and infrastructure siting. The final project layout would also be influenced by pre-disturbance surveys (e.g. rare plant and wildlife) carried out prior to construction, should the project be approved.

Each turbine would be seated on a reinforced concrete foundation (pad) approximately 2 m deep and 15 m in diameter. Depending on final turbine selection, turbine towers would be between 80 to 100m high, with a rotor diameter between 80 to 125 m and a total height from ground between 120 to 165 m. A temporary workspace would be required during construction at each turbine pad for laydown areas and crane operation. Temporary workspaces would be located away from sensitive environmental features and have been estimated to be 50m in radius from the center of the WTG.

Power generated from each turbine would be conveyed through an electrical collection system that includes underground collector cables (on private land) and overhead collector lines (on Crown land located along existing municipal grid road rights-of-way (ROW)). Approximately 70 km of underground lines and 52 km of overhead lines would be required. Collected power would be transferred to a new substation where the power would be stepped up from 34.5 kV to 138 kV. Power would then be transferred via overhead transmission lines to the existing Chaplin Switching Station. A communication and data collection fiber-optic cable would be required and would be placed in the same trench as the electrical collection system where possible.

Approximately 58 km of permanent service roads would be required to allow for access to the WTG pads. During construction the roads would be 10 m wide to facilitate hauling of the turbines and large equipment. Following construction, the roads would be reclaimed to a 5 m wide gravel road to allow for passage of smaller passenger vehicles for long term servicing and maintenance of the WTGs. An operations and maintenance building would be required for storage and as an office for on-site staff. The location of this building has not been finalized however the building may be constructed within the project area or alternatively, within the Village of Chaplin if there is a suitable building available that could be utilized.

Two permanent meteorological towers would be required to monitor meteorological conditions at the site. The towers would be between 80 and 100m high and equal in height to the turbine towers.

The project duration from construction to decommissioning would be in excess of 25 years. Decommissioning and reclamation of the site would occur according to approved decommissioning plans and would adhere to environmental standards in place at the time of decommissioning. Decommissioning would involve dismantling and removal of turbines as well as removal of WTG pads to a depth of 1-1.5 m in order to return the site to a condition suitable for previous land uses (e.g. agricultural, grazing and wildlife habitat).

## **Alternatives Considered**

Alternatives considered by the proponent are presented in Section 2.1.2 of the EIS. Other project locations in southeast and southwest Saskatchewan were deemed by the proponent to present similar environmental aspects (e.g. native habitats including native prairie, upland wooded areas and pasture land), as well as other technical and economic limitations.

The project location was deemed to be most suitable by Windlectric because of an optimal combination of favorable wind direction and velocity conditions in association with a proven capacity factor. The location also provides favorable access to transmission infrastructure with capacity to accept more power. The project location also has a low adjacent population density and an available land base, a portion of which is currently used for agriculture.

### **3. Technical Review Comments**

#### **Introduction**

The intent of the technical review phase of the environmental assessment and review process is to give provincial specialists at a variety of agencies an opportunity to examine the draft EIS to:

- develop their professional opinions about how adequately the environmental issues related to the development have been characterized and addressed; and,
- determine whether the information provided is sufficiently complete and technically accurate enough to support the public review phase of the process.

The technical review of the draft EIS often identifies issues related to potential environmental impacts and proposed mitigation methods that require clarification. These issues are communicated to the proponent and addressed with additional information. Results are presented in the revised EIS submission that undergoes a further review. Upon further review, if the revised EIS contains adequate information, it is accepted and released for public review.

Release of the EIS for public review should not be interpreted as absolute agreement with all items within the EIS, but simply that the issues identified have been sufficiently characterized in order to provide a full understanding of the project and related impacts to interested members of the public.

The final EIS for the Chaplin Wind Energy project was accepted by the EAB as the proponent has sufficiently addressed the issues raised during the technical review of the EIS. Additional project details for various components including: results of pre-disturbance surveys; final site layout (including mitigation integrated based on results of pre-disturbance surveys); the final decommissioning and reclamation plan (including monitoring requirements); and the habitat compensation plan would be finalized after the EIA process

should the development receive ministerial approval. If approved, terms and conditions included in *The Environmental Assessment Act* approval would be the primary regulatory mechanism utilized to ensure proponent commitments included in the EIS are being fulfilled, relevant guidelines are being adhered to, reporting requirements are being met and appropriate environmental safeguards are being implemented throughout the life of the project.

## **Public, First Nations and Métis Engagement Feedback and Response**

Section 3.0 of the EIS provides details on Windlectric's engagement with the public and First Nation and Métis communities.

Public engagement activities for the local communities, landowners, and the RM of Chaplin No. 164 have been ongoing since 2010 and have consisted of meetings and open houses to introduce the project and collect information on potential environmental and socio-economic impacts. Primary concerns expressed during public engagement activities centered on the loss of native prairie, impacts to wildlife, proximity to occupied farm yards, and impacts to roads from heavy truck use. The RM of Chaplin has indicated their strong support for the project.

Windlectric has engaged with non-governmental organizations (NGOs) including Nature Saskatchewan, Nature Conservancy of Canada (NCC), the Chaplin Nature Centre and Ducks Unlimited Canada since 2012 to provide information about the project and solicit input as well as discuss results of field studies that were completed as part of the EIA. Primary concerns expressed by NGOs include: the potential for a reduction in waterfowl nesting density as a result of the project; potential conflicts with NCC land easements; potential wildlife mortality during shorebird migration as well as risks to passerines, bats and raptors during operation; and loss and fragmentation of native prairie.

There are no remaining conflicts with NCC land easements. Windlectric sought to address and respond to all project-specific concerns raised during engagement through the various studies conducted for the EIA. Their approach to assess project risks and develop appropriate mitigation to avoid or minimize risk has been documented in Section 3 of the EIS.

Since 2012, Windlectric has initiated communications with local First Nation and Métis communities via letter, email and phone calls to provide information about the project. To date there has been no response from the communities

to engage with Windlectric on the project. No duty to consult was triggered for this project as it would be located on private and leased Crown land.

## **Technical Review Findings on Public, First Nations and Métis Engagement**

Technical reviewers are satisfied with Windlectric's public engagement activities. Windlectric is encouraged to continue engaging interested stakeholders with an interest in the project to ensure accurate project information is being communicated and concerns are being addressed.

The public review period for the EIA, provides an additional opportunity to review project details and provide comment, and ongoing engagement activities will continue as required should the project receive approval.

## **Biophysical Impacts**

Windlectric has evaluated the possible impacts of the project on the biophysical environment, the possible measures that could be employed to eliminate or mitigate (reduce) the impacts and any residual effects that might remain after the mitigation is in place. In undertaking the EIS, a number of valued ecosystem components (VECs) were identified to facilitate the assessment and interpretation of potential effects associated with the proposed project. The general assessment approach is presented in Section 4.0. A list of the VECs and associated characteristics are listed in Section 4.3.1 of the EIS. A description of the existing conditions for each VEC as well as the assessment of each of the VECs is outlined in Section 6.1-4. Proposed monitoring programs are discussed in Appendix B, J and K. Residual environmental effects are discussed in Appendix C.

## **Terrestrial Environment**

Section 6 of the EIS discusses the potential impacts of the project on the terrestrial environment that includes project-related changes to land, vegetation and wildlife.

### ***Land and Soils***

Section 4.0 of the Technical Proposal (included as Appendix G) provides information on lands and soils in the project area. The proposed project is

situated in the mixed grass ecoregion of south-central Saskatchewan, 4.5 km north of Chaplin Lake. The proposed site layout is planned to be developed on approximately 19,000 ha of private and Crown land. Landscapes in the project area include agricultural fields, small waterbodies or lakes and scattered pastureland. Topography in the area includes gently sloping plains and gullies.

Soils in the southern half of the project area are sandy/gravelly and common to those found throughout the glaciofluvial landscapes in the area. The higher land in the northern half of the project area is made up of loamy brown soils found in the hummocky morainal formations in the area. Saline soils associated with surface concentrations of salts derived from glacial and bedrock aquifers are also common in the region (e.g. Chaplin Lake area).

Surface disturbance totaling approximately 144 ha will be required for construction of the concrete pads for the turbines, for the permanent access roads, and installation of the electrical collection system. Site clearing and construction would result in loss of soil cover until such time as stockpiled soil can be redistributed and revegetated.

### ***Vegetation***

Section 6.1 of the EIS provides information on the assessment of potential environmental effects on vegetation. The project has been partially sited in an area with intact native prairie grassland. To the extent possible turbines and infrastructure would be located on previously disturbed and/or cultivated lands. Currently 34 of the 79 WTGs (and associated access roads) would be located on native grassland, 45 would be located on previously cultivated or other agricultural land. The total amount of construction disturbance (temporary and permanent) for both native (62 ha) and non-native land cover (82 ha) is estimated to be 144 ha. Once design details are finalized, Windlectric has committed to submitting information detailing the actual quantity of land and native prairie impacted as a result of the project including specific details as to how mitigation measures have been implemented to avoid or minimize impacts. In addition, Windlectric has committed to developing a habitat compensation plan for unavoidable impacts to native grassland.

Nine provincially or federally listed plant species have the potential to occur or have been observed within the project area. In the summer of 2014, field surveys were carried out in preparation of the EIS, the surveys did not document any occurrences of plant species at risk. Surveys conducted to date indicate additional survey work is needed to ensure detection of rare species, including species at risk. If approved, rare plant surveys would be required prior to proceeding with construction in accordance with the Saskatchewan

protocol for rare plant surveys, and if species are located Windlectric has committed to developing appropriate mitigation in consultation with the ministry.

Mitigation to prevent significant impacts to vegetation communities are described in Section 6.1 and Appendices J and N and include: avoiding sensitive areas (as identified in the EIS or during pre-disturbance surveys) when selecting locations for project infrastructure and temporary workspaces; utilizing salvaged topsoil and seedbank to enhance re-vegetation; re-seeding with appropriate seed mixes; and implementing appropriate weed control measures. Long term monitoring of the site will also be undertaken to quantify changes in the native plant community surrounding project infrastructure and to detect the presence of any prohibited, noxious or nuisance plant species as identified in *The Weed Control Act, 2010*. Windlectric would submit a native prairie reclamation plan and weed management plan for ministry approval should the project be approved. Windlectric has also committed to mitigating for direct loss to native prairie as a result of the project, including compensation as discussed in Appendices B, G and J.

### ***Wildlife and Wildlife Habitat***

Descriptions of wildlife and habitat as well as information on potential effects of the project on wildlife habitat availability and mortality risk, with a focus on sensitive species, are provided in Section 6.2 of the EIS, and in Appendices C and K.

The project site, situated amongst a complex of large marshes, would be located between several nationally and globally recognized Important Bird Areas (IBA). Chaplin Lake is located approximately 4.5 km south of the closest proposed turbine, which together with Old Wives and Reed Lakes make up the WHSRN site. Paysen, Williams and Kettlehut Lakes, which together make up another IBA, are located approximately 6 km north of the closest proposed turbine. These sites provide staging and nesting grounds for hundreds of thousands of migratory shorebirds and waterfowl annually, including the *Species at Risk Act* listed shorebirds; piping plover (*Charadrius melodus circumcinctus*) and red knot (*Calidris canutus rufa*).

In Appendix M, Windlectric has provided an assessment of the proposed setback distance from Chaplin Lake and the other IBAs in comparison to other wind projects in close proximity to IBAs located in other jurisdictions. The IBAs referenced include the Forward wind energy project in Wisconsin which is sited 3.2 km from a national wildlife refuge; a wind energy project at Bull Creek, Alberta which is sited 1 km from an IBA; a wind energy facility in New

Jersey which is sited 6 km from a national wildlife refuge; and the Shiloh I wind energy project in California located as close as 200 m from an IBA. These projects have been included in the EIS as case studies of wind projects located near or directly adjacent to IBAs where there were concerns about potentially significant bird mortality expressed during the review and approval process. Windlectric concludes that results of post-construction mortality monitoring at the sites stated above indicate that bird mortality is not directly related to proximity to an IBA and the projects showed no significant effects to the function of those sites.

Appendix D4 of the EIS includes all of the wildlife technical data collected as part of the EIA. Windlectric conducted field surveys in 2012 and 2014 and included a 10 km buffer around the project area including Chaplin Lake in order to understand baseline conditions. Surveys conducted include: visual amphibian; acoustic bat; grouse lek; shorebird (nocturnal radar and diurnal visual); wetland activity; avian migration; common nighthawk; short-eared owl; yellow rail and breeding bird.

The proposed location of the project supports numerous species at risk (listed under Schedule 1, Schedule 2, or Schedule 3 of the *Species at Risk Act* as endangered, threatened, or special concern) including: Sprague's pipit, chestnut-collared longspur, loggerhead shrike, common nighthawk, ferruginous hawk and yellow rail which are migratory species as well as northern leopard frog, short eared owl and little brown myotis (bat) which are resident species. Numerous other sensitive wildlife species are found in the project area as has been discussed in Section 6.2 of the EIS as well as in Appendices D3 and K. Windlectric has committed to carrying out additional field surveys following Ministry of Environment Species Detection Survey Protocols prior to construction and would be required to adhere to setback requirements and restricted activity periods outlined in the *Saskatchewan Activity Restriction Guidelines for Sensitive Species (ARG)* as necessary for final infrastructure siting and construction. Windlectric has also committed to abide by all legal requirements, regulations and permit conditions in place to protect Species at Risk.

Windlectric examined potential impacts to wildlife as a result of the project. Potential impacts include changes to habitat availability (i.e. direct habitat loss, sensory disturbance and habitat fragmentation) and changes to mortality risk (i.e. direct and indirect mortality risk).

#### **Changes to Habitat Availability**

Vegetation clearing for construction of the project would result in direct habitat loss for wildlife, the total amount of disturbance resulting from

construction is 144 hectares, 62 hectares of which would be on native prairie grassland and 82 hectares would be on previously disturbed/cultivated land. Habitat loss would continue through the operation phase of the project due to the installation of project infrastructure (turbines) but would be reversible for areas which can be reclaimed following construction activities (buried lines).

Sensory disturbance associated with construction and operation of the project would result in indirect habitat loss for species sensitive to visual and auditory disturbances from increased noise and light. Effect on wildlife species is variable and could include increased stress, loss of productivity, habitat or nest abandonment; potentially resulting in changes in distribution and local abundance. Amphibians, sharp-tailed grouse and ferruginous hawks have shown sensitivity to increased human activity. Noise and light emitted during operation may result in reduced use of adjacent areas by wildlife and vehicle traffic may cause temporary disturbance to wildlife.

Habitat fragmentation and a loss of connectivity would also occur during construction and operation of the project. Construction activities would have an effect on wildlife movement including small mammals, snakes and amphibians. Operation of the turbines would also result in fragmentation as the presence of infrastructure can be perceived by some wildlife as a barrier. Windlectric concluded that wind energy projects have been shown to cause displacement and avoidance in birds.

Windlectric would implement a number of measures to mitigate changes to habitat availability including: siting project infrastructure away from sensitive environmental features and adhering to setback restrictions for sensitive species as necessary; construction in native prairie grassland would be conducted outside of the breeding bird period (May 5 to August 15); limiting tree clearing in hedgerows to maintain perch and roost sites; minimizing vehicle traffic in the project area; and reclamation of temporary disturbance areas following construction. Construction would occur over approximately 12-18 months, and would be staged so disturbance to habitat and wildlife from construction activities would be spatially limited to areas directly adjacent to project components currently under construction.

### **Mortality Risk Assessment**

Clearing of vegetation and potential collisions with vehicles could cause direct mortality of wildlife during construction of the project. During operation of the project direct mortality of wildlife can occur through collisions with wind turbines and associated project infrastructure. Collision mortality usually results from birds and bats striking revolving turbine blades, towers and nacelles. Collision mortality is variable with species behavior, project location,

landscape features, and atmospheric conditions. Passerine bird species represent the most fatalities reported at other wind energy projects.

Indirect mortality of wildlife could result from disturbance in the project area during both the construction and operation phases of the project. Increased activity, noise, vibration and light associated with the project could cause behavioral changes that result in increased predation. Disturbance may also cause displacement of wildlife into lower quality habitats, requiring increased energy expenditure and potentially reducing survival and reproduction rates.

Windlectric conducted a bird and bat mortality risk assessment (risk assessment), which is included as Appendix K, to examine the potential collision risk for avian species in the project area. The risk assessment was conducted to rank the likelihood and scale of mortality risk to birds and bats resulting from turbine operation. The risk assessment was conservative as it assessed potential risk associated with operation of 88 of the largest turbines which is not consistent with current design (i.e., 79 turbine maximum). As discussed in Appendix K, the risk assessment was largely qualitative as there is research that suggests the mortality rates predicted through quantitative modelling tend to be higher than what is seen during follow-up monitoring and is not representative of actual risk associated with wind power projects.

In their assessment Windlectric has used a conservative avoidance rate for birds of 98%, based on relevant literature and mortality data from other wind projects. Additional factors considered in the risk assessment included species specific movement patterns, information collected during baseline surveys, information from mortality monitoring studies conducted at existing wind energy projects and other published literature. The risk assessment grouped related species (i.e. migratory shorebirds, resident shorebirds, migratory passerines, resident passerines, nocturnal raptors, diurnal raptors, waterfowl, waterbirds, aerial insectivores, migratory bats and resident bats) and assessed each group separately to allow an assessment based on differing life-history characteristics.

Windlectric indicated that predicting bird mortality with wind energy projects is challenging and is indicative at best because of uncertainty related to: changes in bird movement patterns and use of the project area from pre- to post construction; species specific movement patterns and use of areas during nocturnal periods; species-specific collision susceptibility rates; and effects of site-specific environmental variables that influence collision susceptibility.

Based on findings in the risk assessment, Windlectric has concluded that with the application of mitigation measures including those outlined in the adaptive

management plan, and considering the setback distance of 4.5 km from Chaplin Lake and the avoidance behavior of birds and bats, the proponent expects predicted mortality would remain below thresholds for all species groups considered. Windlectric determined that the risk to migratory shorebirds, resident shorebirds and waterfowl was lowest because these groups represent a very low proportion of fatalities at existing wind energy facilities. Windlectric determined the risk to passerines, resident bats and nocturnal raptors was in the moderate category because of results from mortality studies conducted at existing wind energy facilities and due to lower confidence in the data. Aerial insectivores, diurnal raptors and migratory bats are ranked as higher risk in the moderate category because they make up a larger proportion of fatalities at wind energy projects. The use of follow up monitoring would be used to confirm avian mortality is within predicted thresholds.

### **Mortality Thresholds**

Windlectric has included a discussion of mortality thresholds in Appendices J and K. Saskatchewan does not currently have guidelines for bird and bat mortality thresholds for wind energy projects. Windlectric has referenced the mortality thresholds that are part of Ontario's bat and bird guidelines for wind energy projects. Specific mortality threshold have been identified for the following:

- 4 bats/MW/year;
- 5.6 birds/MW/year and would be adjusted should the number of turbines change, to correspond to 14 birds/turbine/year which is the threshold in Ontario;
- 10 birds at any one turbine (significant mortality event)
- 33 birds at multiple turbines (significant mortality event)
- 0.1 raptors/MW/year
- 0.05 provincially tracked raptors/MW/year

Monitoring and reporting of bird and bat mortality will be required for the life of the project.

The mortality threshold identified by Windlectric for endangered and threatened species is zero. Should a fatality of an endangered or threatened species be detected, Windlectric will report the incident to the Saskatchewan Ministry of Environment within 48 hours and will implement measures identified in the adaptive management plan and determine appropriate mitigation requirements in consultation with relevant government agencies.

An exceedance of any mortality threshold will result in 1) cause and effect analysis, 2) selection of appropriate mitigation measures in consultation with

regulatory agencies and as identified in the Adaptive Management Plan, 3) additional monitoring to ensure the mitigation measures are effective.

Predicted mortality thresholds would be confirmed through rigorous monitoring should the project proceed. Where measured actual outcomes exceed the commitments made by the proponent, the ministry would consider appropriate action to ensure the continued protection of wildlife and wildlife habitat.

### **Mitigation and Adaptive Management Plan**

Windlectric would employ a number of proactive and reactive mitigation measures presented as part of an adaptive management plan to reduce the risk of bird and bat mortality. The adaptive management approach aims to make informed predictions of an outcome, conduct monitoring and apply reactive mitigation where outcomes deviate from predictions and continue to monitor to ensure outcomes are achieved. Mitigations, monitoring and details of the adaptive management plan were initially proposed and described in section 6.0 and Appendix B of the EIS, however throughout the course of the EA process, enhancements have been made to both mitigation proposed and monitoring activities to confirm predictions (Appendices J and K).

Proactive mitigation measures that are proposed for incorporation into the project include: burying electrical lines where feasible; installation of power line bird diverters; appropriate meteorological tower design; infrastructure siting and turbine removal to adhere to Saskatchewan ARG setback restrictions; appropriate lighting; minimum cut-in speeds of turbines; fog cut-out of turbines; blade pitching during low wind speeds; appropriate turbine spacing; and minimal use of fencing.

Reactive mitigation measures that would be incorporated if mortality thresholds are exceeded would include: increased cut-in speeds at individual turbines or turbine clusters and periodic shut-down of individual turbines or turbine clusters during known high risk periods for birds and bats.

### **Mortality Monitoring Program**

Windlectric has proposed a three year mortality monitoring program (discussed in Appendices J and K) to confirm impacts to wildlife are consistent with predictions in the EIS. Mortality monitoring would occur from May 1 – October 31 and would include: regular bat/bird mortality surveys around specific WTGs; monitoring of bat/bird carcass removal rate by scavengers; and monitoring of searcher efficiency. Should the project be approved, conditions of approval may require extension of the proposed 3 year timeframe to ensure information collected is adequate to allow a full understanding of project

impacts and effectiveness of the adaptive management strategy. Results of mortality monitoring would be reported to the ministry annually. The ministry would also be notified within 48 hours of any significant mortality event as a result of the project. The formal monitoring program would occur over three years with the potential of extending it an additional two years if mortality conditions exceed thresholds. Following the conclusion of the formal monitoring program Windlectric would train on-site staff to carry out ongoing mortality detection and reporting for the life of the project.

Windlectric has committed to incorporating the use of radar in the post-construction monitoring program in order to monitor bird and bat movement in the project area and assess the relationship between movement and mortality rates. The design of the radar survey program would be similar to the survey program that was conducted during the EIA. This additional data would help to confirm the effectiveness of the mitigations employed.

### **Technical Review Findings on the Terrestrial Environment**

Technical reviewers are satisfied with the assessments conducted to characterize project impacts to land and soils.

Further details would be required on how and where native prairie reclamation would be carried out should the project be approved, and would be based on the finalized quantity (hectares) of native prairie impacted. Windlectric would submit detailed native prairie reclamation and weed management plans for ministry approval. Plans would include details for reclamation, monitoring, corrective actions and follow-up reporting.

Technical reviewers have remaining concerns about the siting of the project on native grasslands near Chaplin Lake in the vicinity of the Chaplin-Old Wives – Reed Lake (C-OW-RL) WHSRN sites because of the importance of the area for shore birds, waterfowl, multiple migratory and prairie species at risk. The setback from the WHSRN site (4.5 km from closest turbine) and other IBAs (6 km from closest turbines) may reduce the potential for project interactions with species utilizing these areas. Windlectric conducted the mortality risk assessment in response to reviewers concerns and refined the monitoring plan and adaptive management strategy. The risk assessment has considered the potential scale of impact versus the likelihood to derive an overall ranking of risk. Based on factors considered in the risk assessment, the proponent concluded the risk remained between low to moderate and predicted mortality rates would remain below thresholds identified.

Due to inherent uncertainty with all risk assessments and modelling activities, reviewers raised concerns that the assessment for this project may not provide an accurate estimation of the collision risk posed by the project. Reviewers felt bird strikes of stationary objects may not have been adequately accounted for in the assessment. Uncertainty regarding nocturnal migrating behavior and migration height of many passerine species has resulted in remaining uncertainty surrounding the risk posed to these species by this project. Passerines have been found to make up a majority of all bird fatalities at wind energy projects. The risk associated with direct impacts may be higher considering the proposed project site supports numerous passerine species some of which are considered sensitive or are listed under SARA.

Reviewers also noted that had the scope of the risk assessment been broadened to include indirect impacts (such as habitat loss and sensory disturbance) and a more thorough assessment of nocturnal mortality risk, it may have provided a more complete assessment of project risk. Reviewers acknowledge that greater certainty and understanding regarding mortality risk associated with the project could best be achieved through a robust monitoring program.

Reviewers emphasized that considering the number of species utilizing the area either as a migratory/staging area or breeding/nesting habitat; the uncertainty could underestimate the potential for mortality events significantly larger than predicted. Evidence provided by Windlectric related to mortality events for other projects located near IBAs appears to support the conclusions in the risk assessment as mortality rates at other referenced projects largely remained below thresholds. Site specific conditions at the proposed project location and the species composition at the Chaplin site may not support direct comparisons to other projects.

To address the uncertainty in the results of the risk assessment, Windlectric has proposed a monitoring plan and adaptive management strategy to either confirm predictions in the EIS or identify additional actions that should be undertaken to further reduce risk of collision. Thresholds for triggering the adaptive management plan are consistent with what other jurisdictions have required including for projects located near IBAs.

Windlectric has also proposed measures to limit the potential for impacts to specific species in the project area. For example, species detection surveys carried out in 2015 confirmed there are several ferruginous hawk nests in the project vicinity. Windlectric has agreed to remove or relocate turbines previously proposed to adhere to the 750 m setback outlined in the Saskatchewan ARG.

## **Water and Aquatic Environment**

Windlectric describes the project related effects to hydrology and the aquatic environment during construction, operation and closure of the project as well as unplanned and natural events in Section 5.3 of the technical proposal (included as Appendix G).

Watercourses in the project area are ephemeral, flow seasonally and intermittently and therefore are unlikely to support fish populations or habitat. Project infrastructure and access roads would be setback would be located a minimum of 30 m from streams and wetlands and as such project activities will have minimal interaction with the aquatic environment. Any potential for impacts to potential aquatic habitats will be further minimized through the use of construction best management practices outlined in Appendix B of the EIS, as well as adhering to all relevant guidelines.

## **Technical Review Findings on Water and Aquatic Environment**

The erosion control measures proposed during construction appear adequate to prevent sediment from entering any nearby waterbodies; silt fences and berms will also be used where necessary. Minimal disruption to the aquatic environment will be achieved by avoiding stream crossings, drainage channels and other watercourses when developing site access. Technical reviewers are satisfied by the assessment of the project's potential impacts on surface water and the aquatic environment and the mitigations proposed to prevent or minimize impacts.

## **Atmospheric and Acoustic Environment**

The main project phase expected to generate air and dust emissions is the construction phase as outlined in Section 2.3.1 of the EIS. Construction vehicle emissions during land clearing and road development will be cumulative with other activities (e.g. agricultural and railway activities) in the area. A majority of emissions generated by the project would be short in duration, low intensity, and reversible after project construction is complete. Operation of the project would provide a cumulative and positive offsetting of greenhouse gas emissions that are byproducts of other sources of electricity generation such as coal-burning power plants. Estimated reductions in GHG emissions would be approximately 530,000 metric tonnes per year. Windlectric will comply with all regulatory thresholds for noise and emissions and significant impacts to the atmospheric environment are not anticipated.

## **Noise**

Windlectric commissioned a noise assessment (included as Appendix I) in order to evaluate the noise impact on receptors in the area. Saskatchewan does not have noise guidelines; therefore thresholds and sound level modeling methodologies used in Ontario were applied. Noise receptors are a minimum of 500 m from noise sources. Sound pressure levels at noise receptors will be within the 40 A-weighted decibels (dBA) limit for rural areas at all times.

## **Technical Review Findings on Atmospheric and Acoustic Environment**

Technical reviewers are satisfied with the assessment of the project's potential for impacts due to noise and emissions and with the mitigations proposed to prevent or minimize impacts.

## **Residual and Cumulative Effects**

Windlectric has included an analysis of the cumulative impacts of residual effects of the project in sections 6.1-4 of the EIS. Cumulative effects assessment are included where there is a residual environmental effect on a valued component and the residual effect acts cumulatively with residual effects of other physical activities.

Cumulative effects of residual impacts may be associated with future activities such as the construction of transmission power lines. For example, impacts could include: change in plant species abundance and distribution; change in native vegetation types; change in wildlife habitat availability; and change in wildlife mortality risk. Mitigation proposed to reduce or avoid significant cumulative effects include: minimizing further disturbance in native vegetation, coordinating access requirements with future projects to avoid the need for construction of additional roads; avoiding development in wetlands; minimizing project footprint in native vegetation; using existing roads wherever possible to reduce the length of new roads constructed; and utilizing high use roads where possible to reduce road traffic and disturbance to wildlife. Further details on additional mitigation measures that will be implemented can be found in Section 6.2 of the EIS, and in Appendices J and K.

## **Technical Review Findings on Residual and Cumulative Effects**

Technical reviewers have remaining uncertainty about the residual and cumulative effects of the project; however the monitoring program and

mitigation strategy proposed will help to confirm residual and cumulative effects are consistent with those predicted in the EIS.

## **Effects of the Environment**

Windlectric considered how the environment could potentially adversely affect the proposed project in section 7. The environmental events that were considered under this section were: extreme temperatures; extreme rainfall; extreme snow and ice events; severe storms and lightning; high winds; and wildfires. The assessment results presented indicate the project as proposed is not likely to be adversely affected by natural disaster or predicted changes to climatic conditions in the project area.

## **Technical Review Findings on the Effects of the Environment**

Technical reviewers noted that wildlife, especially large concentrations of migratory species and/or sensitive species, should be regarded as a force of nature that could affect the project by hampering the ability to carry out the project activities in their normal, planned manner. An analysis of wildlife could have been included in the assessment for effects of the environment on the project. Technical reviewers were otherwise satisfied by the assessment of the potential for the environment to impact the project and the mitigations proposed to prevent or minimize impacts.

## **Heritage Resources and Socio-Economic Considerations**

### **Heritage Resources**

Information on Windlectric's assessment of potential effects on heritage resources resulting from the project can be found in section 6.4 and Appendix F of the EIS. A Heritage Resource Impact Assessment (HRIA) is required for the project as the potential for heritage sites is ranked as moderate to high. Windlectric has commissioned an archaeological consultant to carry out all of the heritage work under the requirements of *The Heritage Property Act*.

Mitigation measures undertaken to protect heritage resources will be determined by the Heritage Conservation Branch of the Ministry of Parks, Culture and Sport. Potential mitigation measures to prevent significant impacts to heritage resources may include: avoidance of known heritage sites; controlled archaeological excavation of heritage resource sites that cannot be

avoided; on site monitoring of construction activities by a professional archaeologist; fencing of heritage resource sites near the project area; and evaluation of any route changes or added components.

As a result of the HRIA studies conducted in 2015 Windlectric has agreed to remove turbines previously proposed to limit the potential for impacts to heritage resources in the project area.

### **Socio-Economic**

The socio-economic environment and the detailed assessment of potential effects to residents in the project area are discussed in section 6.3 of the EIS.

### ***Community Development and Support Capacity***

Windlectric recognizes that the construction of the wind turbine facility has the potential to affect the communities in the local area of the project. Windlectric has engaged with the community in order to discuss and address any concerns about the project on the socio-economic environment in the project area and anticipate any issues.

Windlectric heard concerns from the community with respect to proximity of the project to occupied farm yards and heavy truck use and potential impact to roads. Windlectric has addressed these concerns to the extent possible.

Construction of the project would require approximately 45 to 90 person-years of employment; operation of the project would require approximately 15 to 20 full time workers. Windlectric has committed to giving first priority for employment to qualified individuals from nearby communities.

Windlectric has assessed the impacts to the socio-economic environment and has determined that the project will have a positive effect on employment and business opportunities in the area.

### ***Change in Demand on Local Infrastructure and Services***

Windlectric also anticipates minor changes due to increased demand for housing, services and physical infrastructure from additional workers. Potential mitigations to address these changes in demand on local infrastructure and services include: coordination with emergency response agencies; development of approved emergency response plans; having first aid trained personnel on site; and development of traffic management plans to determine safe road crossing procedures.

## **Technical Review Findings on Heritage and Socio-Economic Considerations**

Technical reviewers are satisfied that Windlectric has adequately examined and will continue to address all the heritage and socio-economic impacts of the project.

## **Decommissioning, Reclamation and Closure Plan**

Section 2.4.1 of the EIS includes a conceptual decommissioning and reclamation plan for the project site. Windlectric indicates the proposed project has an expected lifespan of 25 years with the option to replace or recondition the turbines to extend the life of the project. If the project is fully decommissioned Windlectric will submit detailed decommissioning and reclamation plans for regulatory approval. Decommissioning will involve dismantling and removal of above ground infrastructure and removal of the turbine pads to a depth of 1-1.5m below grade.

## **Technical Review Findings on Decommissioning, Reclamation and Closure Plans**

Technical reviewers are satisfied with Windlectric's decommissioning and closure program.

## **4. Conclusions**

Saskatchewan Environmental Assessment Review Panel members and the ministry conclude that Windlectric has provided sufficient information such that the EIS can be made available for public review.

## Invitation to Comment

Public is invited to comment on the project EIS for a 30 day period ending November 17, 2015.

The public is invited to review Windlectric's EIS and the TRC and provide their comments no later than November 17, 2015. The EIS and Final TRC are being made available for review at the offices of the Village of Chaplin and at [saskatchewan.ca/environmentalassessment](http://saskatchewan.ca/environmentalassessment).

Written comments received during the public review of the EIS and TRC will be considered by the Minister of Environment when he makes his decision under section 15(1) of *The Environmental Assessment Act* to either:

- (a) give ministerial approval to proceed with the development and impose any terms and conditions that he considers necessary or advisable; or
- (b) refuse to approve the development.

## Contact

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