

Appendix 22-3

**CONFIDENTIAL BUSINESS
INFORMATION**

**Spring Avian and Bat Work
Plan**

Bull Run Wind Project, Clinton
County, New York



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March 18, 2016

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1.0 INTRODUCTION

Invenergy Wind Development LLC (Invenergy) is planning the development of the Bull Run Wind Project (Project) in the towns of Clinton and Ellenburg in Clinton County, New York. The Project, as currently proposed, is approximately 54,444 acres with up to 151 turbines.

In order to assess the habitat and wildlife resources in the area, Invenergy contracted Stantec Consulting (Stantec), an independent environmental consultant, to conduct pre-construction avian and bat surveys for the Project. This work plan is for spring 2016 surveys only; a consecutive work plan will detail the summer and fall 2016 avian and bat surveys.

This scope is based on the Standard Pre-Construction Studies detailed in the New York State Department of Environmental Conservation's (NYSDEC) Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects (NYSDEC Guidelines; NYSDEC 2009)¹, the U.S. Fish and Wildlife Service's (USFWS) Land-based Wind Energy Guidelines (USFWS 2012)², and the Eagle Conservation Plan Guidance (ECP Guidance, 2013)³. This work plan incorporates comments from the New York Regional Field Office of the USFWS in Cortland, New York during meetings between Invenergy, Stantec, and USFWS on 26 May 2015 and 20 January 2016, comments from the NYSDEC during meetings between Invenergy, Stantec, and NYSDEC at the NYSDEC Albany office on 28 May 2015 and 19 January 2016, and comments from USFWS and NYSDEC during a 22 July 2015 conference call.

¹ NYSDEC. 2009. Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects. Accessed at: http://www.dec.ny.gov/docs/wildlife_pdf/finwindguide.pdf

² USFWS. 2012. U.S. Fish and Wildlife Service Land-based Wind Energy Guidelines. Accessed at: http://www.fws.gov/ecological-services/es-library/pdfs/WEG_final.pdf

³ U.S. Fish and Wildlife Service. 2013. Eagle Conservation Plan Guidance: Module 1 – Land-based Wind Energy: Version 2.

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2.0 EAGLE AND RAPTOR POINT COUNT SURVEY

Point count surveys will assess baseline activity of bald eagles (*Haliaeetus leucocephalus*), golden eagles (*Aquila chrysaetos*), and other raptor species at the Project. The surveys are designed to investigate the species, number of individuals, distribution, behavior, and observation rates of raptors. For eagles, eagle use and the number of eagle minutes within the rotor-swept area (RSA) will be calculated, consistent with the ECP Guidance. Stantec will also record other large bird species (i.e., waterbirds and songbirds) observed during surveys.

Stantec initiated point count surveys in fall 2015 and winter 2015-2016. Stantec will continue point count surveys during spring 2016. Methods will be based on a combination of those in the ECP Guidance and the NYSDEC Guidelines. Eagle and raptor point count surveys will be conducted year round consistent with the ECP Guidance; however, survey effort will be increased during the spring migration when bald and golden eagles and raptors are known to migrate through the region. In accordance with the NYSDEC Guidance, spring surveys will be conducted weekly from 1 March to 31 May 2016.

Eagle and raptor point count visual surveys will be conducted at 31 plots⁴ within the Project area. Each plot will consist of an 800-meter radius covering an area of 2 square kilometers per plot. Plots will be distributed throughout the Project area, where there are suitable viewsheds of the sky; plots will not be placed in forested areas unless suitable vantage points exist. Plot locations will be finalized after the first site visit to each point and will consider viewsheds and landowner access permission. Point count locations will be mapped using Global Positioning Systems (GPS).

During spring surveys, there will be weekly visits to the Project and point count surveys will consist of 2-hour observation periods per point. Six plots will be surveyed each week for a total of 12 survey hours per week. In the spring, there will be 13 weeks for a total of 156 survey hours.

Surveys will occur in all weather conditions except when visibility is poor. Surveys will target the hours of 9 am to 4 pm, the daytime hours in which eagles and other raptors tend to be most active. The starting plot will change each survey cycle to enable sampling of each plot during a range of daylight hours.

During surveys, observers will record the horizontal distance of each eagle from the observer, and the duration of observation of each eagle flying within plots – recorded as the duration of the observation within 800 m and equal to or less than 200 m (the RSA), per the ECP Guidance.

⁴ Per the April 2013 ECP Guidelines, the total number of proposed point count locations was determined by calculating the entire turbine area including a 1-km buffer around turbines, calculating 30% of the area, and dividing by 2 (to account for the 2 square-kilometer plots). There were 24 point count locations sampled during the fall 2015 and winter 2015-2016; however, the project area expanded in March 2016 and 7 points were added for the spring surveys.

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In addition to distance and flight height data, each eagle's flight path will be drawn on a close-up map of the 800 m radius count circles. The birds' behavior and activity (prevalent behavior during each 1-minute interval of observation), the age class of the eagle, as well as weather data at the time of observation will be recorded (wind direction and speed, cloud cover, precipitation, and temperature). Other species of raptor will be recorded on separate datasheets and their flight paths will also be mapped. The species, number of individuals, location, flight height, and behavior will be recorded for each raptor observed.

After completion of the seasonal point counts, data collected will be summarized by season. For eagles and raptors, the number of species and individuals will be summarized, as well as the flight behaviors. For eagles, the number of eagle minutes within the RSA will be calculated, consistent with the ECP Guidance. For the purposes of analysis, the number of minutes of observation within plots (eagle minutes) will be rounded to the next highest integer (e.g., an eagle seen for 30 seconds is rounded to 1 eagle minute). The eagle exposure rate per season, calculated as eagle minutes per number of survey hours within the Project area, will be calculated.

The spring results will be incorporated into an Annual Report.

3.0 AERIAL BALD EAGLE NEST SURVEY

An aerial bald eagle nest survey will be conducted in the spring of 2016, in accordance with the ECP Guidance. The objectives of survey will be to check for bald eagle nests in the Project area and within 10 miles of the proposed turbine locations. The nearest known bald eagle nest is 12 miles southwest of the current project boundary (USFWS pers. comm.).

The 2016 survey will be timed to correspond with the period when bald eagles are incubating nests in the region, in late March or early April. The survey will be conducted with a fixed-wing aircraft. The survey area will consist of 1-mile (1.6 kilometer [km]) wide transects oriented east-to-west over the Project area, out to a distance of 5 miles from turbines. Additionally, any suitable habitat (e.g., forested streams, large ponds and wetlands, and reservoirs) within 5–10 miles (8–16 km) of turbine locations will be surveyed for nest locations. The survey will consist of low altitude passes, approximately 150 meters (m; 500 feet [ft]) above ground level.

During the flight, 2 Stantec biologists, with experience identifying eagles and their nests, will scan for eagles and potential nest structures from both sides of the plane. Other raptor species and avian species of interest observed during the flight (either flying or potential nest structures) will be recorded as incidental observations and a GPS location will be recorded for each observation.

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If the status of any potential eagle nests cannot be determined during the flight, then ground based nest checks may be conducted. If the potential nests of other raptor species are located during the flight, follow-up ground-based surveys may be conducted to determine the species and status of the nests.

The results of the aerial eagle nest survey will be summarized in the Annual Report.

4.0 BREEDING BIRD SURVEY

Stantec will conduct a breeding bird survey in May and June 2016 at the Project. The objective of the survey will be to sample the species, relative abundance, and distribution of birds breeding within the different habitats of the Project area.

Stantec anticipates that 40 transects will provide adequate coverage of the available habitats present. Each transect will be 300 m in length with 7 point count locations established every 50 m along each transect. Thirty transects will be located in proposed turbine areas and 10 transects will be located at control sites (away from turbine locations). Control transects will be positioned at least 600 m from turbine locations. Turbine and control transects will be distributed proportionately among available habitats. For example, if 75% of the Project area is located in forested habitats and 25% is located in grassland or other agricultural habitats, there will be 30 forest turbine transects and 10 grassland/agricultural turbine transects.

Each transect will be sampled once at the end of May and twice in June. The general location of each survey transect will be determined using a Google Earth aerial image of the Project and plotted with a Global Positioning System (GPS). The final location of each transect will be confirmed during the first site visit to each transect.

A qualified biologist familiar with New York state birds by sight and sound will walk the transects during the period between a half hour before sunrise to approximately 11 am on days without inclement weather (rain, dense fog, or winds greater than 10 – 15 miles per hour). Stops will be made at every 50 m along transects at point count locations to record all birds seen and heard during a 5 minute session.

The following data will be recorded for each bird observed:

- Start and end time of the observation period;
- Weather including temperature, wind speed, wind direction, and cloud cover;
- Species identification and number of individuals per species;
- Distance from observer;
- Mode of detection (visual or auditory); and
- Behavior (nesting, flying, perching, singing, etc.).

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For analysis, observation data will be pooled across transects within similar vegetation types (e.g., grassland or woodland). The following data summaries will be completed for both the turbine and control transects:

- List of all species observed (including those observed beyond 50 m from transects and 50 m from observers);
- Species abundance (number of birds observed per transect, for only those birds observed within 50 m of transects and 50 m from the observer);
- Species diversity index (density of species, for only those birds observed within 50 m of transects and 50 m of the observer);
- Species richness (number of species observed, for only those birds observed within 50 m of transects and 50 m from the observer); and
- Species frequency (the percent of surveys in which a species was observed, for only those birds observed within 50 m of transects and 50 m of the observer).

Results will be incorporated in the 2016 Annual Report.

5.0 PASSIVE BAT ACOUSTIC DETECTOR SURVEY

The objectives of passive acoustic monitoring will be to characterize the seasonal and nightly timing of bat activity at heights approaching the proposed RSA (20-45 m), and to investigate the species composition by frequency group (high, mid, or low) of calls recorded.

A total of 4 acoustic bat detectors will be deployed for continuous passive monitoring from mid-April to the end of May 2016 (detectors will remain operating in the field beyond the spring season, as will be described in a summer and fall work plan). Anabat SD1 detectors (Tittley Electronics Pty Ltd.) will be deployed in 2 on-site meteorological (met) towers: one met tower located centrally in the Project area in a field, and the second located in the northern half of the project area in a forested setting, per agency request. In the guylines of both met towers, there will be a detector deployed at approximately 45 m and 20 m in height. Detectors will be programmed to record acoustic data nightly from sunset until sunrise during the survey period. Periodic visits will be conducted to download data and maintain the detectors.

Analysis

Stantec will determine the timing of each identified bat call and will summarize activity patterns according to detector-night and month for each detector. All data files recorded by the acoustic detectors will be analyzed via visual analysis. Each call file will be qualitatively identified to frequency group, as follows:

High frequency bat calls have a minimum frequency above 38 kilohertz (kHz) and are likely produced by:

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- Indiana bat (*Myotis sodalis*): federally and New York state-listed endangered (NYSDEC 2016⁵);
- little brown bat (*M. lucifugus*);
- northern long-eared bat (*M. septentrionalis*): federally and New York state-listed threatened (NYSDEC 2016);
- eastern small-footed bat (*M. leibii*): New York state-listed special concern (NYSDEC 2016).

Mid frequency bat calls have a minimum frequency between 30 and 45 kHz and are likely produced by:

- tri-colored bat (*Perimyotis subflavus*);
- eastern red bat (*Lasiurus borealis*).

Low frequency bat calls have a minimum frequency below 30 kHz and are likely produced by:

- silver-haired bat (*Lasionycteris noctivagans*);
- big brown bat (*Eptesicus fuscus*);
- hoary bat (*Lasiurus cinereus*).

Wind speed, wind direction, and temperature data from the met tower will be compiled on a nightly basis to assess if these weather variables are correlated with bat activity levels.

Results will be incorporated into a 2016 Annual Report.

⁵ (NYSDEC) New York State Department of Environmental Conservation. 2016. List of Endangered, Threatened, and Special Concern Fish & Wildlife Species of New York State. Available at <http://www.dec.ny.gov/animals/7494.html>.