

Exhibit DD

Specific Standards for Wind Facilities

**Nolin Hills Wind Power Project
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d/b/a Nolin Hills Wind, LLC

Prepared by



Tetra Tech, Inc.

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Table of Contents

1.0	Introduction.....	1
2.0	Analysis Area.....	1
3.0	Public Health and Safety	1
3.1	Public Access Restrictions	1
3.2	Structural and Equipment Safety.....	2
4.0	Cumulative Effects.....	3
4.1	Access Roads	3
4.2	Electrical Lines	4
4.2.1	Underground Collector Lines	4
4.2.2	Overhead Collector Lines	4
4.2.3	Overhead Transmission Lines.....	5
4.3	Substations.....	6
4.4	Avian and Wildlife Impact Minimization.....	6
4.5	Visual Impacts Minimization.....	7
4.6	Lighting.....	8
5.0	Site Standards for Transmission Lines	8
6.0	Conclusions	9

Acronyms and Abbreviations

APLIC	Avian Power Line Interaction Committee
Applicant	Nolin Hills Wind, LLC
ASC	Application for Site Certificate
BPA	Bonneville Power Administration
EFSC or Council	Energy Facility Siting Council
FAA	Federal Aviation Administration
kV	kilovolts
NESC	National Electrical Safety Code
O&M	operations and maintenance
OAR	Oregon Administrative Rules
Project	Nolin Hills Wind Power Project
SCADA	Supervisory Control and Data Acquisition
UEC	Umatilla Electric Cooperative

1.0 Introduction

Exhibit DD provides information for the Nolin Hills Wind Power Project (Project) as required to meet the submittal requirements in Oregon Administrative Rule (OAR) 345-021-0010(1)(dd) paragraphs (A) and (C). Paragraph (B) does not apply because the Project does not include a surface facility related to underground gas storage reservoirs.

OAR 345-021-0010(1)(dd)

(dd) Exhibit DD. If the proposed facility is a facility for which the Council has adopted specific standards, information about the facility providing evidence to support findings by the Council as required by the following rules:

(A) For wind energy facilities, OAR 345-024-0010 and 345-024-0015; and

(C) For any transmission line under Council jurisdiction, OAR 345-024-0090.

This exhibit demonstrates compliance with the approval standards in OAR 345-024-0010, OAR 345-024-0015, and OAR 345-024-0090.

2.0 Analysis Area

In accordance with Section IV of the Project Order, the Analysis Area for Exhibit DD is the Site Boundary. The Site Boundary is defined in detail in Exhibits B and C.

3.0 Public Health and Safety

OAR 345-024-0010 Public Health and Safety Standards for Wind Energy Facilities

To issue a site certificate for a proposed wind energy facility, the Council must find that the applicant:

3.1 Public Access Restrictions

OAR 345-024-0010(1) Can design, construct and operate the facility to exclude members of the public from close proximity to the turbine blades and electrical equipment.

Public access to Project facilities will be minimal to none. All Project facilities will be located on private lands; therefore, public access is already restricted and limited. Access roads developed or improved for the purposes of Project construction and operation will be gated and locked, as necessary, when not actively in use. Should the Project site be accessed without permission, design features of the Project components will limit the accessibility of the Project facilities to the public and are designed to prevent tampering with Project equipment. The wind turbines can be accessed only through a steel door that will be kept locked except during maintenance. The wind turbine

models under consideration are designed to have a minimum ground-to-blade clearance of 36.5 feet. The Operations and Maintenance (O&M) Building will be in a fenced area, and the building will be locked when not occupied. The Project substations and construction yards will be within fenced enclosures. The 230-kilovolt (kV) transmission line(s) will utilize overhead poles that inhibit climbing. The staging area will be signed as “Private, No Trespassing” with on-site security staff.

The Project has also been designed around substantial setbacks that further limit public access to the turbines and associated electrical components. The Project uses a minimum setback of 110 percent of the maximum blade tip height from public roads; this both limits public access and prevents harm to members of the public in the highly unlikely event of a catastrophic failure (e.g., fall-down) of a turbine. If a new transmission line is required, a 500-foot setback from each residence will be required unless written approval is provided by the homeowner(s).¹ County-required setbacks are analyzed in detail in Exhibit K of this Application for Site Certificate (ASC).

With these restrictions, design features, and setbacks, the only persons who will come in close proximity to the turbines or electrical equipment will be employees of the Project, or the landowners on whose property the Project is located. Landowners will not be in close proximity to the turbine blades, given the 36 feet or greater of ground-to-blade clearance of the considered turbine models.

3.2 Structural and Equipment Safety

OAR 345-024-0010(2) Can design, construct and operate the facility to preclude structural failure of the tower or blades that could endanger the public safety and to have adequate safety devices and testing procedures designed to warn of impending failure and to minimize the consequences of such failure.

Prevention of structural failure of wind turbines includes designing, engineering, and constructing the Project to meet or exceed all current applicable standards. This includes avoiding dangers to human safety related and nonseismic hazards in many ways, including conducting site-specific geotechnical evaluations for the facilities to inform design and construction. Exhibit H provides information on structural codes and standards that will be followed in Project design.

During operation, a rigorous inspection program of the turbine foundations is maintained. In addition, the Supervisory Control and Data Acquisition (SCADA) system (described in Exhibit B) acts as the “nerve center” of the Project by connecting individual turbines, substation(s), and meteorological towers to a central computer housed in the O&M Building. The SCADA system allows each component of the Project to be monitored for activity in present time. If an issue arises with a turbine, it alerts the O&M staff so that turbine(s) can be shut down to minimize consequences of failure and potential safety risks.

¹ Written approval to be recorded with County deed records. Exceptions to the 500-foot setback include transmission lines placed in a public right-of-way.

In addition, as noted above, the Project is designed to maintain substantial setbacks such that, in the highly unlikely event of a catastrophic failure, the collapsed turbine or thrown blades could not impact public roads or nonparticipating property owners.

4.0 Cumulative Effects

OAR 345-024-0015 Cumulative Effects Standard for Wind Energy Facilities

To issue a site certificate for a proposed wind energy facility, the Council must find that the applicant can design and construct the facility to reduce cumulative adverse environmental effects in the vicinity by practicable measures including, but not limited to, the following:

4.1 Access Roads

OAR 345-024-0015(1) Using existing roads to provide access to the facility site, or if new roads are needed, minimizing the amount of land used for new roads and locating them to reduce adverse environmental impacts.

Nolin Hills Wind, LLC (the Applicant) will utilize existing private roads and farm access tracks to the greatest extent practicable for providing access to the wind turbines and other Project facilities. During Project construction and operation, existing interstate, state, and county roads will be used to access the Project area. Some existing private roads will be improved, while in some areas new access roads will be required to provide access to turbine locations. The total mileage of the new site access roads will vary depending on the turbine option chosen for the Project. The Option 1 layout will require approximately 38 miles of site access roads, of which approximately 29 miles will be new permanent access roads and 9 miles will be temporary improvements to existing roads. The Option 2 layout will require approximately 63 miles of site access roads, of which about 44 miles will be new permanent access roads and 19 miles will be temporarily improved. Where new access roads are needed, they are sited to limit the overall impacts of the Project to soils, habitat, and agricultural practices. For example, new access roads are generally sited along the edges of farm fields to limit disruptions to plowing patterns. Roads are placed within the fields when the alternative will be an impact to sensitive habitat. Through an iterative design process, some access roads have been re-routed or eliminated entirely to avoid impacts to wetlands, streams, Category 1 habitat, and archaeological and culturally significant features.

All newly constructed and improved site access roads will be graded and graveled to meet load requirements for heavy construction equipment, as necessary. Most site access roads will be initially constructed to be wider than needed for operations, to accommodate the large equipment needed for construction. Following turbine construction, the site access roads will be narrowed for use during O&M. The additional disturbed width required during construction will be restored following the completion of construction by removing gravel surfacing, restoring appropriate

contours with erosion and stormwater control best management practices (see Exhibit I), decompacting as needed, and revegetating the area appropriately.

4.2 Electrical Lines

OAR 345-024-0015(2) Using underground transmission lines and combining transmission routes.

The amount of electrical lines will vary depending on the turbine option chosen for the Project. The Project will require up to 99 miles of 34.5-kV collector lines, most of which will be located underground. In addition, up to approximately 32 miles of 230-kV overhead transmission line(s) will be installed. Where possible, 230-kV lines will be placed along or adjacent to existing overhead transmission lines. These options are discussed below in Sections 4.2.1, 4.2.2, and 4.2.3. All collector and transmission lines will be constructed according to National Electrical Safety Code (NESC) standards.

4.2.1 Underground Collector Lines

The Project will require approximately 59 to 90 miles of underground collector lines. Installation of the underground electrical collector lines will have temporary impacts to soils, habitat, wildlife, and agricultural practices. The collector lines will typically run in narrow trenches no less than 3 feet deep in tilled ground installed below grade. For the purposes of the ASC, the Applicant assumes a temporary impact corridor approximately 35 feet wide for the buried collector lines. Most of the collector lines will be placed within or adjacent to access roads to minimize additional disturbance. In cases in which underground collector lines cross agricultural fields, the collector lines may be placed deeper to prevent damage to the lines by agricultural activities including deep tillage; however, the lines will not be deep enough to affect groundwater resources. In situations in which soils and underlying geology will make burying the collector lines to a depth of 3 feet impractical, the collector lines may be buried at a depth of less than 3 feet but still be in accordance with NESC standards.

4.2.2 Overhead Collector Lines

Some of the collector lines may be installed overhead in situations where a buried cable would be infeasible, such as for long “home run” stretches, and at stream or canyon crossings. In such instances, overhead collector lines will be supported by a wooden structure. Each support pole will be buried up to approximately 12 feet in the ground and will extend to a height of up to approximately 100 feet above ground, depending on the terrain. There will be permanent impacts only in the locations of the support poles for the overhead collector lines. The structures will be spaced approximately 150 to 300 feet apart, depending on specific site conditions. Aside from the pole footprints, there will be no permanent impacts associated with the collector line corridor aboveground. Temporary impacts from collector line construction will be restored and revegetated following construction. A total of up to 15.6 miles of overhead collector lines will be installed.

4.2.3 Overhead Transmission Lines

The Applicant anticipates that the Project will connect to the Bonneville Power Administration (BPA) transmission system via new and upgraded Umatilla Electric Cooperative (UEC) transmission lines from the northern Project substation to the existing UEC Cottonwood Substation (24.9 miles total), or via a new overhead 230-kV transmission line to the proposed BPA Stanfield Substation north of the Umatilla River (4.1 miles total). From the Cottonwood Substation, an existing UEC 230-kV transmission line with capacity for the additional power generated by the Project would carry that power north to BPA's McNary Substation. Additionally, a single circuit 230-kV transmission line supported by H-frame or monopole structures (or other form as-needed for specialized locations) will run between the two collector substations (6.8 miles total).

Under the UEC Cottonwood route, the Project would tie in to the regional electric grid via a transmission line leading from the proposed northern Project substation approximately 17.2 miles to the existing UEC Butter Creek Substation, from which an existing 115-kV UEC transmission line would be upgraded to incorporate a 230-kV line to carry power generated by the Project approximately another 7.7 miles north to the UEC Cottonwood Substation. The upgrade would consist of replacing the existing support poles with new structures that can support restringing the existing 115-kV transmission line and adding a 230-kV transmission line. After the Cottonwood Substation, power from the Project would be transmitted over an existing 230-kV line north to the BPA McNary Substation. The UEC lines would be constructed by UEC and may be permitted locally through Umatilla County; however, as described in Exhibit B, they are conservatively included in this Preliminary ASC to analyze the maximum potential Project impacts.

The alternate BPA Stanfield route would require a new overhead 230-kV transmission line that would extend from the proposed northern Project substation to the proposed BPA Stanfield Substation. The Stanfield route leads north following County Road 1350 from the northern Project substation, then turns northwest parallel to an existing high-voltage transmission line. Approximately 1.5 miles upriver from the community of Nolin, the transmission line would span the Umatilla River and continue in parallel with the existing transmission line to the Stanfield Substation. A total of 2.8 miles of this lines would run parallel to the existing BPA line. This route as described is based on indicative information received to date from BPA regarding the planned Stanfield Substation and is therefore subject to change as BPA's process of developing that facility proceeds.

The design and route of the transmission lines have been chosen to minimize impacts to resources. The transmission lines will be constructed to Avian Power Line Interaction Committee (APLIC) standards. APLIC recommended measures are intended to protect raptors and other large birds from accidental electrocution and are sufficient to protect even the largest birds that may try to roost on the Project 230-kV transmission line. The wooden or non-reflective steel monopole construction will further reduce the lines' visibility compared to steel lattice construction.

4.3 Substations

OAR 345-024-0015 (3) Connecting the facility to existing substations, or if new substations are needed, minimizing the number of new substations.

The Applicant proposes to construct up to two on-site collector substations to increase the voltage from the 34.5-kV collection system to 230 kV, for transmission through the proposed overhead transmission lines. The Project will interconnect to the regional grid via either publicly owned and operated transmission lines to be constructed locally by UEC, or a new 230-kV transmission line anticipated to be constructed, owned, and operated by the Applicant to the proposed BPA Stanfield Substation. A 230-kV transmission line will connect the two proposed Project substations.

The proposed northern Project substation would connect to the existing UEC Butter Creek Substation and then to the existing Cottonwood Substation. From Cottonwood, power from the Project would be transmitted over an existing 230-kV line north to BPA's existing McNary Substation. The alternate route via the BPA Stanfield Substation would require a new 230-kV line to connect to the proposed northern Project substation. No existing substations are available to connect along this route.

4.4 Avian and Wildlife Impact Minimization

OAR 345-024-0015 (4) Designing the facility to reduce the risk of injury to raptors or other vulnerable wildlife in areas near turbines or electrical equipment.

The Project has been sited and designed to minimize impacts to raptors and other wildlife, as well as wildlife habitat, as described in Exhibits P and Q of this ASC. The Project has been sited in areas dominated by agricultural use and along existing roads where feasible, and impacts to habitat used by protected species have been avoided and minimized to the extent possible, to reduce the risk of injury to vulnerable wildlife including raptors. Based on the results of surveys, the Applicant sited Project facilities to avoid all impacts to wetlands and Category 1 habitat, and to minimize impacts to other habitats including Category 2 habitat (see Exhibit P). The Project layout was redesigned in order to avoid Washington ground squirrel colonies that were identified during field surveys; Washington ground squirrels are state endangered and are prey for some raptor species. Based on consultation with the Oregon Department of Fish and Wildlife, voluntary, conservative turbine setbacks from the rim of Alkali Canyon were applied to reduce the potential for impacts to raptors using the area. The Applicant applied a voluntary 0.25-mile turbine setback from nests of state sensitive raptors to minimize collision risk and nesting disturbance, and sited turbines away from areas of relatively higher raptor use as identified during avian and eagle use surveys at the Project. Other design aspects of the Project that will minimize impacts to wildlife habitat include the use of a largely underground electrical collection system; the application of APLIC design standards for the transmission lines; and the use of freestanding, non-guyed turbines and permanent met towers.

Additional measures to avoid and minimize impacts to wildlife will be implemented during Project construction. These include raptor nest and Washington ground squirrel monitoring and seasonal

construction timing restrictions; having on-site environmental monitors during construction; and observing low speed limits. Additional measures are described in Exhibits P and Q.

Finally, the Applicant will provide mitigation for unavoidable impacts to wildlife habitat as outlined in the Draft Habitat Mitigation Plan and monitor bird and bat fatalities, raptor nests, and Washington ground squirrel colonies as described in the Draft Wildlife Monitoring Plan (Attachments P-3 and P-5, respectively, of Exhibit P). The avoidance and minimization measures and the proposed mitigation and monitoring measures together limit the impacts to wildlife as feasible, and compensate for those unavoidable impacts as mandated by the Energy Facility Siting Council (EFSC or Council) approval standards, in compliance with the ODFW Habitat Mitigation Policy.

4.5 Visual Impacts Minimization

OAR 345-024-0015 (5) Designing the components of the facility to minimize adverse visual features.

Due to the size of modern wind turbines, opportunities and measures to effectively reduce visual impacts of the Project are limited. However, the Applicant has or will utilize a number of design, engineering, and other measures to reduce visual impacts to the extent practicable. The Applicant has sited the Project in a remote area of Umatilla County and designed the turbine array such that it will have minimal visual impacts to the nearest towns of Pendleton, Pilot Rock, Hermiston, Stanfield, Umatilla, Irrigon, and Echo. The location of the Project is such that, where it may be visible from other cities or developed areas in the vicinity, it will be at a background viewing distance of over 5 miles so it will not dominate the viewshed. There are two important scenic resources identified in the area located approximately 6 to 7 miles away. The routes and design for the transmission line alternatives have also been chosen in part to minimize the lines' visibility.

Additional measures that the Applicant will employ to minimize visual impacts of the Project, include:

- The wind turbines and towers will be painted in a uniform matte-finish neutral white or light gray;
- The support poles for the transmission line will be wood or non-reflective steel (e.g., self-weathering steel) to blend with the surroundings;
- The O&M Building will be designed and constructed to be generally consistent with the character of agricultural buildings used by farmers or ranchers in the area, and the buildings finished in a neutral color to blend with the surrounding landscape;
- Substation structures will be finished in neutral colors to blend with the surrounding landscape;
- Lighting will be kept to a minimum necessary, and designed to prevent offsite glare;
- No advertising or commercial signage is to be displayed on any part of the facility;

- Vegetation clearing and ground disturbance will be limited to the minimum area necessary to safely and efficiently install the Project equipment;
- Access roads and other areas of ground disturbance will be watered during construction, as needed, to avoid the generation of airborne dust; and
- Temporary impact areas will be restored and revegetated as soon as practicable following completion of construction.

4.6 Lighting

OAR 345-024-0015 (6) Using the minimum lighting necessary for safety and security purposes and using techniques to prevent casting glare from the site, except as otherwise required by the Federal Aviation Administration or the Oregon Department of Aviation.

The effects of Project lighting will be minimal. Lighting for the Project will consist of the minimum necessary for safety purposes. Lights at the O&M Building and substations will be downward-shielded and aimed inward to the site to avoid casting glare offsite. These lights will not typically be on at night; instead they will utilize motion-sensor switches to provide lighting only when needed.

Lighting of the turbines will consist of the minimum required by Federal Aviation Administration (FAA) regulations. The turbines will be marked and lighted according to FAA standards (FAA Advisory Circular 70/7460-1L), but no other lighting will be used on the turbines. FAA standards call for painting the turbines and towers white or light gray, making them visible to pilots from the air. Flashing red aviation lighting will be mounted atop turbines. For turbines greater than 499 feet in height, the FAA requires all turbines to have two lights placed on the nacelle (one on each side). Under current FAA standards, all of the lights will be programmed to flash in unison, allowing the entire Project to be perceived as a single unit by pilots flying at night. The specific location, operation, and type of aviation lighting system will be determined in consultation with FAA prior to commencing operation of the Project. FAA lighting may also be installed on the met towers, depending on the overall lighting scheme for the Project, to be determined prior to operation and in consultation with FAA.

The Applicant will base final lighting design on FAA recommendations.

5.0 Site Standards for Transmission Lines

OAR 345-024-0090 Siting Standards for Transmission Lines

To issue a site certificate for a facility that includes any transmission line under Council jurisdiction, the Council must find that the applicant:

- (1) Can design, construct and operate the proposed transmission line so that alternating current electric fields do not exceed 9 kV per meter at one meter above the ground surface in areas accessible to the public;*

(2) Can design, construct and operate the proposed transmission line so that induced currents resulting from the transmission line and related or supporting facilities will be as low as reasonably achievable.

Although the 230-kV and 34.5-kV electrical lines do not constitute energy facilities under EFSC jurisdiction because they do not cross more than one city or county, they are related or supporting facilities to the wind energy project which is under Council jurisdiction. Exhibit AA of this application demonstrates compliance with the Siting Standard of OAR 345-024-0090. Specifically, Exhibit AA demonstrates that the proposed transmission line will generate alternating current electric fields that will not exceed 4.26 kV per meter at one meter above ground surface, which is substantially lower than the 9 kV per meter required by the standard (see Exhibit AA, Section 2). With the maximum electrical field being lower than the 9-kV/m standard set forth in OAR 345-024-0090(1), no mitigation or monitoring programs are proposed.

6.0 Conclusions

The evidence provided in this exhibit demonstrates that the Applicant will construct and operate the Project in compliance with siting, public health and safety, and cumulative effect Council standards as they relate to wind facilities and transmission lines.

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