

Request for Amendment 5 for the Biglow Canyon Wind Farm

**Submitted to
Oregon Energy Facility Siting Council**

Prepared for



Portland General Electric Company

Prepared by



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Acronyms and Abbreviations

Acronym/Abbreviation	Definition
AC	alternating current
BCWF or Facility	Biglow Canyon Wind Farm
BESS	battery energy storage system
BIGL 2 or Project Developer	BIGL 2, LLC
Certificate Holder or PGE	Portland General Electric Company
CFR	Code of Federal Regulations
Council or EFSC	Energy Facility Siting Council
DC	direct current
EPA	U.S. Environmental Protection Agency
EPC	engineering, procurement, and construction
gen-tie	generation-tie
GSU	generator step-up
HV	high voltage
HVAC	heating, ventilation, and air conditioning
ISU	inverter step-up
Li-ion	lithium ion
kV	kilovolt
kV/m	kilovolt per meter
MW	megawatt
MWh	megawatt-hour
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and maintenance
OAR	Oregon Administrative Rules
ODOE	Oregon Department of Energy
ORS	Oregon Revised Statutes
PCS	power conversion station
PV	photovoltaic
RFA	Request for Amendment
SCADA	supervisory control and data acquisition
Site Certificate	Site Certificate on Amendment 4
Solar Facility	solar energy generation and battery storage components
SPCC	Spill Prevention, Control, and Countermeasure
UL	Underwriters Laboratories
W	watt
Wind Facility	operational wind energy facility

1.0 Introduction

The Portland General Electric Company (PGE or Certificate Holder) submits this Request for Amendment (RFA) 5 to the Site Certificate on Amendment 4, issued March 27, 2026 (Site Certificate) for the Biglow Canyon Wind Farm (BCWF or Facility) to add a second phase of solar photovoltaic (PV) energy generation and battery storage capacity to the BCWF following the solar power generation and battery storage capacity approved under RFA 4.

BCWF, owned and operated by PGE, is located within an approved site boundary comprising approximately 25,000 acres, approximately 2.5 miles northeast of the town of Wasco in Sherman County, Oregon (Figure 1). The BCWF operates under the Site Certificate from the Oregon Energy Facility Siting Council (Council or EFSC) as administered by the Oregon Department of Energy (ODOE). BCWF consists of 217 operating wind turbines, with a maximum blade tip height of 445 feet, and a peak generating capacity of 450 megawatts (MW) (Wind Facility). RFA 4, approved March 27, 2026, added 125 MW alternating current (AC) generating capacity from PV solar arrays and 500 megawatt-hours (MWh) in battery storage capacity. The solar energy generation and battery storage components (Solar Facility) described in RFA 4 are currently under construction.

In RFA 5, PGE proposes to add up to 200 MW AC generating capacity from PV solar arrays and 1,000 MWh in battery storage capacity (RFA 5 Solar Facility) by expanding the overall BCWF site boundary by approximately 839 acres. The RFA 5 Solar Facility is located across approximately 622 acres of the existing BCWF site boundary and 839 acres of expanded site boundary, for a total of approximately 1,461 acres (together, RFA 5 Site Boundary; see Figure 4).

The RFA 5 Site Boundary provides a conservative estimate of the maximum area needed for development and micro-siting through final design and construction for the RFA 5 Solar Facility, rather than the anticipated disturbance footprint. Primary infrastructure includes solar arrays, inverters, battery energy storage system (BESS) facilities and their subcomponents (i.e., inverters), one collector substation, and medium-voltage collector lines (herein collectively referred to as “Solar Components”). Additionally, the Solar Components include operations and maintenance (O&M) structures, site access roads, internal roads, perimeter fencing, facility entry gates, and temporary laydown areas. The maximum generating capacity from the Solar Components will be 200 MW AC. Power generated from the Solar Components will be transferred to the grid via a 230-kilovolt (kV) generation tie (gen-tie) transmission line, approximately 2.7 miles long. The RFA 5 Solar Facility includes the Solar Components and the gen-tie transmission line.

PGE will own and operate the RFA 5 Solar Facility as a part of the BCWF, which, to date, has been developed by BIGL 2, LLC (BIGL 2, or Project Developer). BIGL 2, in its capacity as the Project Developer, supports PGE in this RFA 5 and may construct and temporarily operate the RFA 5 Solar Facility on behalf of PGE under a Build-Transfer Agreement.

1.1 Existing Site Certificate and Prior Amendments

The Council originally issued a Site Certificate to Orion Sherman County Wind Farm LLC, a wholly owned subsidiary of Orion Energy LLC for the BCWF, effective June 30, 2006.¹ The BCWF, as originally approved, consisted of up to 225 wind turbines with an aggregate nameplate generating capacity of 337.5 MW of electricity or 150 wind turbines with an aggregate nameplate generating capacity of 450 MW and supporting facilities.

The Site Certificate has been amended four times as described below:

- The Council issued Amendment 1 to the Site Certificate on November 3, 2006, which approved a transfer of the Site Certificate from Orion to PGE.²
- The Council issued Amendment 2 to the Site Certificate on May 10, 2007, to accommodate new access roads and collector line segments, to increase the temporary area of construction disturbance, to modify one micro-siting corridor and to revise the requirements of several site certificate conditions.³
- The Council issued Amendment 3 to the Site Certificate on October 31, 2008, to increase total length of collector lines (up to 106 miles), authorize multiple structures within a 5-acre O&M facility, increase the total length of new access roads (to 44 miles), increase area of construction disturbance and length of temporary crane paths, and increase the area within the BCWF site boundary to accommodate Phase 2 construction layout.⁴
- The Council issued Amendment 4 to the Site Certificate on March 27, 2026, to add a 125 MW PV power generation facility and 500 MWh BESS within the existing BCWF Site Boundary.⁵

There have been seven Change Requests or Amendment Determination Requests for the BCWF.

- Change Request Determination 1 – June 4, 2007: Request to modify an access road and extend the crane path. Modifications of the access road were determined to improve compatibility of the facility with underlying farm use and reduce the area of the facility's footprint impact. A site certificate amendment proceeding was deemed unnecessary and approval for the requested modifications was granted.

¹ Site Certificate for the Biglow Wind Facility (June 2006). Available at: https://www.oregon.gov/energy/facilities-safety/facilities/Facilities%20library/BCW_site_certificate_063006.pdf

² First Amended Site Certificate for the Biglow Canyon Wind Farm (November 2006). Available at: https://www.oregon.gov/energy/facilities-safety/facilities/Facilities%20library/BCW_final_order_amend_1_110306.pdf

³ Second Amended Site Certificate for the Biglow Canyon Wind Farm (May 2007). Available at: https://www.oregon.gov/energy/facilities-safety/facilities/Facilities%20library/BCW_final_order_amend_2_051007.pdf

⁴ Third Amended Site Certificate for the Biglow Canyon Wind Farm (October 2008) Available at: https://www.oregon.gov/energy/facilities-safety/facilities/Facilities%20library/BCW_site_certificate_amend_3_103108.pdf

⁵ Fourth Amended Site Certificate for the Biglow Canyon Wind Farm (March 2026). Available at: <https://www.oregon.gov/energy/facilities-safety/facilities/Facilities%20library/2026-04-01-Fourth-Amended-Site-Certificate-Signed.pdf>

- Change Request Determination 2 – June 27, 2007: Request to eliminate a portion of the approved, but not yet constructed, access road and construct a new temporary crane path. A site certificate amendment proceeding was deemed unnecessary and approval for the requested modifications was granted.
- Change Request Determination 3 – July 21, 2008: Request to modify three micrositing areas to accommodate three turbines outside of currently approved corridors. A site certificate amendment proceeding was deemed unnecessary and approval for the requested modifications were granted.
- Change Request Determination 4 – July 21, 2008: Request to construct additional buildings within the approved 5-acre footprint of the O&M facility. A site certificate amendment proceeding was deemed unnecessary and approval for the requested modifications was granted.
- Change Request Determination 5 – March 12, 2009: Request minor modifications to the approved facility that included changes to the routing for collector lines and adjustment to turbine access roads. A site certificate amendment proceeding was deemed unnecessary and approval for the requested modifications was granted.
- Change Request Determination 6 – January 12, 2017: Request construction of an additional storage structure of approximately 3,600 square feet as part of the approved O&M site. A site certificate amendment proceeding was deemed unnecessary and approval for the requested modifications was granted.
- Amendment Determination Request 7 – March 14, 2019: Request to transition crane pads from a temporary disturbance to a permanent disturbance. A site certificate amendment proceeding was deemed unnecessary after receiving additional information.

1.2 Amendment Required under OAR 345-027-0350 and Review Process under OAR 345-027-0351

OAR 345-027-0350 – Changes Requiring an Amendment

Except for changes allowed under OAR 345-027-0353, an amendment to a site certificate is required to:

- (1) Transfer ownership of the facility or the certificate holder as described in OAR 345-027-0400;*
- (2) Apply later-adopted law(s) as described in OAR 345-027-0390;*
- (3) Extend the construction beginning or completion deadline as described in OAR 345-027-0385;*
- (4) Design, construct or operate a facility in a manner different from the description in the site certificate, if the proposed change:*

(a) Could result in a significant adverse impact that the Council has not addressed in an earlier order and the impact affects a resource or interest protected by an applicable law or Council standard;

(b) Could impair the certificate holder's ability to comply with a site certificate condition; or

(c) Could require a new condition or a change to a condition in the site certificate.

The proposed modifications to the BCWF require an amendment under Oregon Administrative Rules (OAR) 345-027-0350 (3), (4)(a) and (c). Pursuant to OAR 345-027-0351(2), the standard review process consists of rules OAR 345-027-0359, OAR 345-027-0360, OAR 345-027-0363, OAR 345-027-0365, OAR 345-027-0367, OAR 345-027-0371, and OAR 345-027-0375.

The requirements of OAR 345-027-0360 are addressed in the following sections and document attachments.

2.0 Certificate Holder Information – OAR 345-027-0360(1)(a)

(1) To request an amendment to the site certificate required by OAR 345-027-0350(3) or (4), the certificate holder must submit a written preliminary request for amendment to the Department that includes the following:

OAR 345-027-0360(1)(a) The name of the facility, the name and mailing address of the certificate holder, and the name, mailing address, email address and phone number of the individual responsible for submitting the request;

2.1 Name of the Facility

The name of the facility is Biglow Canyon Wind Farm, and the Certificate Holder is Portland General Electric Company.

2.2 Name and Mailing Address of the Certificate Holder

Portland General Electric Company

121 SW Salmon Street, 3WTC0403

Portland, OR 97204

2.3 Name and Mailing Address of the Individuals Responsible for Submitting the Request

Forrest Carithers
 Senior Director, Environmental Health and Safety
 Portland General Electric Company
 121 SW Salmon Street
 Portland, OR 97204
Forrest.Carithers@pgn.com
 972-400-2936

3.0 Detailed Description of the Proposed Change – OAR 345-027-0360(1)(b)

OAR 345-027-0360 Preliminary Request for Amendment

(1) To request an amendment to the site certificate required by OAR 345-027-0350(3) or (4), the certificate holder shall submit a written preliminary request for amendment to the Department that includes the following:

(a) A detailed description of the proposed change, including:

The Certificate Holder proposes to add the Solar Components to the BCWF as part of RFA 5. Table 1 provides a summary of the proposed changes, and a more detailed description of the changes follows below the table. Section 3.1 provides a detailed project description of the facility components, structures, systems, and related or supporting facilities included with RFA 5.

Table 1. Approved and Proposed Facility Components

Facility Component	Approved Facility ¹	Proposed Modifications ²
Site Boundary	25,000 acres	Add 839 acres to the approved BCWF site boundary.
Solar Micrositing Area	1,924 acres in the RFA 4 Solar Facility	None
RFA 5 Site Boundary	–	1,461 acres, with 622 acres within the approved BCWF site boundary and 839 acres to be added within the expansion area, as noted above.
Solar Photovoltaic Modules	264,836	391,152 additional modules, occupying up to 1,244 acres
Solar Inverter (quantity)	34	54 additional
Solar Step-up Transformers (quantity)	34	54 additional

Facility Component	Approved Facility ¹	Proposed Modifications ²
Underground 34.5-kV collector cable	Wind: 106 miles Solar (RFA 4): 52 miles Facility Total: 158 miles	Solar (RFA 5): 103 miles ³ Facility Total: 261 miles
Aboveground 34.5-kV electrical line	Combined total of 15 miles	None
Substations	Two: Biglow Canyon Substation and Biglow Solar collector substation (Fox Canyon Substation)	One new collector substation
Battery energy storage system (BESS)	500 megawatt-hours total energy storage capacity in up to 153 battery storage units (5 acres)	1,000 megawatt-hours total energy storage capacity in up to 305 additional battery storage units (8.7 acres)
BESS inverters (integrated into battery enclosures)	Up to 153	Additional: up to 305
BESS transformers	39	78 additional
Access Roads	New Roads: 10.5 miles Existing Road Improvements: 0.7 mile to provide an all-weather surface, and in some cases, widening the roads to accommodate construction vehicles.	New Roads: 17.6 miles, limited to gravel roads along the perimeter fence and inside the array field. Existing Road Improvements: None planned. Any road improvements will be determined based on condition at the time of construction. Evaluation of current road conditions have indicated that existing roads are of sufficient quality and width to support construction and operation activities for the proposed Solar Components. If improvements are required, they would likely be in the form of road widening and/or improving the surface condition.
Operations and Maintenance (O&M) Building	Authorization of multiple structures within the 5-acre BCWF O&M facility, limiting the combined square footage of structures to 17,500 square feet. Three 400-square-foot storage containers within the 3-acre Biglow Solar O&M facility.	One new O&M office trailer (720 square feet total), with six storage containers (400 square feet each, 2,400 square feet total) for general industrial use, housing spare parts and maintenance equipment, and one control building (600 square feet) inside the collector substation.
Temporary Construction Areas (Staging, Laydown, Parking, etc.)	16 miles of temporary crane paths + 8.7 acres temporary construction area for Biglow Solar	Temporary laydown area (12 acres total)

Facility Component	Approved Facility ¹	Proposed Modifications ²
Temporary and Permanent Impacts	Temporary: 518 acres Permanent: up to 1,623 acres	Temporary: 44.09 acres Permanent: 1,244.10 additional acres ⁴
<p>1. All values for the approved BCWF were approved in the Final Order on RFA 4 for the Biglow Canyon Wind Farm unless individually specified otherwise.</p> <p>2. The Proposed Modifications (RFA 5 Site Boundary) indicate the additional proposed facilities or components. Design assumptions represented are intended to establish the maximum facility footprint and environmental impacts that will allow for flexibility in final selection, design specifications, and equipment layout in RFA 5.</p> <p>3. Length of underground collector line between the transformers and proposed collector substation.</p> <p>4. See Section 3.4.3 below.</p>		

- 1. Expand the Site Boundary.** The Certificate Holder proposes to expand the BCWF site boundary as shown in Figure 4. The proposed expansion (i.e., RFA 5 Site Boundary) adds approximately 839 acres to the approved BCWF site boundary, resulting in a total BCWF site boundary of approximately 25,839 acres.

All areas within the proposed site boundary expansion have been surveyed for biological and cultural resources. Section 3.4.3 of this document provides a description of the anticipated worst-case scenario temporary and permanent impacts associated with RFA 5.

- 2. Add PV solar energy generation and increase maximum peak generating capacity for the BCWF.** The Certificate Holder proposes to amend the Facility to include up to 200 MW of additional PV solar generation, increasing the total authorized solar generating capacity to 325 MW and the total combined Facility generating capacity to 775 MW.
- 3. Amend the BCWF Facility description to include the RFA 5 Solar Facility .** The Certificate Holder proposes to amend the approved Facility to include Solar Components, consisting of up to 200 MW AC of PV solar generation, with up to 1,000 MWh storage capacity, and associated collection, electrical, operations, maintenance, and supporting facilities, located within the defined RFA 5 Site Boundary. The proposed BESS will improve the dispatchability of the energy generated by the RFA 5 Solar Facility. The Certificate Holder proposes one AC-coupled BESS located adjacent to the proposed collector substation.

The RFA 5 Site Boundary encompasses approximately 1,461 acres, including approximately 622 acres within the currently approved BCWF site boundary and 839 acres in the proposed expanded site boundary. All temporary and permanent impacts from the proposed modifications in RFA 5 will be limited to the RFA 5 Site Boundary.

- 4. Amend the Site Certificate Conditions.** The Certificate Holder proposes to amend the existing Site Certificate Conditions as described below in Section 5.0 and proposed in redline on the Fifth Amended Site Certificate (Attachment 1). The proposed edits provide more clarity regarding responsibility, timing, and implementation for compliance.

3.1 Proposed Project Components, Structures, and Systems – OAR 345-021-0010(3)(a)

The description of the proposed amended BCWF is included as required to meet the submittal requirements of OAR 345-021-0010(3)(a) paragraphs (A) through (F).

Note that the proposed components in RFA 5 are representative and technology advancements may alter their given specifications; however, these potential alterations are not anticipated to create an impact that has not already been addressed, mitigated through existing Site Certificate Conditions, or authorized by the Council with approval of RFA 5.

3.1.1 Overview of Amended Facility

As currently approved, the Facility is an electrical generation facility capable of generating up to 575 MW of electrical power on 25,000 acres in Sherman County, Oregon. The Facility consists of 217 operating wind turbines, operating up to 450 MW, and an approved 1,924 acres of solar PV components with up to 125 MW generating capacity and up to 500 MWh storage capacity (currently under construction).

In RFA 5, the Certificate Holder proposes to amend the Site Certificate to expand the approved BCWF site boundary to include up to 200 MW AC of nominal and average generating capacity as defined in Oregon Revised Statutes (ORS) 469.300(4)(c) of solar energy generation and one BESS with the capability of storing up to 1,000 MWh in total.

The amended BCWF will generate electricity using the existing wind turbines and the new solar modules wired in series and in parallel to form an array, which in turn is connected to electrical infrastructure. Additionally, a BESS will be included for the purpose of improving dispatchability of the solar power generated. The RFA 5 Solar Facility will add one new collector substation and one 230-kV gen-tie line, approximately 2.7 miles long and located entirely within the existing BCWF boundary, which will connect to the approved Biglow Solar collector substation (Fox Canyon Substation, under construction), connecting the proposed and approved Solar Facility to the grid via the existing Biglow Canyon Substation (point of interconnection). These components are all described in greater detail in Section 3.1.2.

This RFA 5 demonstrates that the BCWF, as amended, will be designed, constructed, and operated consistent with the relevant Council siting criteria and standards.

3.1.1.1 Definition of RFA 5 Site Boundary

The current approved BCWF site boundary is approximately 25,000 acres, which encompasses all existing, approved BCWF components. The Certificate Holder proposes to expand the approved BCWF site boundary to include an additional 839 acres and modify the use of approximately 622 acres within the approved BCWF site boundary (Figure 4) to accommodate the RFA 5 Solar Facility. Together, the 622 acres in the approved BCWF site boundary and the 839 acres in the proposed expanded site boundary comprise the RFA 5 Site Boundary, the approximately 1,461 acres of

continuous land within which construction of the additional Solar Components may occur.⁶ This is a conservative estimate of the maximum area needed for development, micrositing, and temporary disturbances during construction, rather than the anticipated disturbance footprint.

3.1.1.2 Defined Study Areas for RFA 5

Consistent with OAR 345-027-0360(3), ODOE concurred⁷ with the Certificate Holder's use of a defined portion of the approved BCWF site boundary and the proposed expanded site boundary (i.e., RFA 5 Site Boundary) shown on Figure 4 to establish study area boundaries for RFA 5 under OAR 345-001-0010(35) and the boundary to develop the property owner list and map under OAR 345-027-0360(1)(g) for RFA 5. ODOE concurred with excluding the remaining BCWF site boundary that does not overlap with the defined area shown in Figure 4 from analysis in RFA 5 because no changes are proposed to any BCWF components in the remaining BCWF site boundary as part of RFA 5. Therefore, this defined area shown on Figure 4 is referred to for the remainder of RFA 5, including throughout the various exhibits in Attachment 5, as the "RFA 5 Site Boundary." The RFA 5 Site Boundary represents a conservative estimate of the maximum area needed for development, micrositing, and temporary disturbances for the RFA 5 Solar Facility (as described below) during construction. All study areas within the meaning of ORS 345-001-0010(35) are measured from the RFA 5 Site Boundary.

The Solar Components include the solar arrays, inverters, BESS facilities and their subcomponents (i.e., inverters), collector substation, medium voltage collector lines, O&M structures, site access roads, internal roads, perimeter fencing, facility entry gates, and temporary laydown areas. The Solar Siting Area in RFA 5 is approximately 1,244 acres and represents the anticipated disturbance footprint of the Solar Components, in addition to additional permanent disturbance associated with other components of the RFA 5 Solar Facility and described in Section 3.4.3 below, that together constitute the permanent disturbance within the RFA 5 Site Boundary.

3.1.1.3 Site Plan and General Arrangement

The layout for the amended BCWF with the general arrangement of buildings, equipment, and structures is shown on Figure 2. As noted above, this layout is provided for analysis purposes; although the final design may differ from the preliminary site plan provided, the actual solar equipment and layout selected will not exceed the impacts analyzed.

3.1.2 Major Components, Structures, and Systems

Solar energy will be generated by using multiple arrays of solar panels connected to electrical infrastructure. The term "array" refers to solar panels wired in series and in parallel. Solar panels generate electricity by means of a PV effect, whereby the materials in the panels absorb the sun's energy in the form of photons and release electrons. The capture of these free electrons produces an

⁶ OAR 345-001-0010(25).

⁷ Sarah Esterson, Senior Policy Advisor at ODOE, pers. comm., e-mail message, June 29, 2026.

electrical current that can be collected and supplied to the electrical power grid. The solar panels, known in the industry as modules, will be installed to form module blocks.

The major components of the proposed solar energy generation system include the solar modules, racking systems, posts/piles, and related electrical equipment (i.e., inverters and transformers). These components are combined to form a solar array. The layout of the solar array can vary depending on project size, technology, topography, and other constraints. Therefore, PGE seeks to permit a range of technology to preserve design flexibility. The solar modules and associated equipment, as well as the precise layout of the solar array and related or supporting facilities, have not yet been finalized. During final design, PGE will consider all solar technologies available to ensure the most efficient and productive solar array layout. Although changes in the exact layout and technology could occur, the actual solar array equipment and layout selected will not exceed the impacts analyzed in RFA 5. Because technology is changing rapidly, this RFA 5 analyzes impacts associated with the largest anticipated footprint, and the actual solar equipment and layout selected will not exceed the impacts analyzed.

As described in Section 1.2 above, the solar array is proposed within the Solar Siting Area containing one or more separately fenced areas. The maximum solar array fence line area depicted for the Solar Siting Area includes the solar energy generation system components (i.e., modules, inverters, transformers, tracking systems, posts, underground collector lines, and other associated equipment), BESS components, O&M structures, substation, and temporary laydown areas (see Figure 2). The area inside the solar fence line for the Solar Siting Area is considered permanent impact (see Section 3.4). The substrate on the ground inside the solar array fence line will be vegetated, or a mix of gravel where needed for maintenance and access roads or where gravel already exists.

The RFA 5 Solar Facility is expected to be constructed over a period of approximately 18 months (see Section 3.1.5).

3.1.2.1 Solar Modules and Racking

Solar modules use mono- or poly-crystalline cells to generate electricity by converting sunlight into direct current (DC) electrical energy. The electrical energy generation from one module varies by module size and the number of cells per module. As technology evolves, final module specification can be in flux until late in the design and development process. The modules used in the current preliminary site design each have a nameplate rating of 625 watts (W) and measure 2.382 meters by 1.134 meters. The solar modules consist of N-type monocrystalline solar cells, an antireflective coating, a metal frame, and factory installed wire connectors. The modules will be connected in series to form rows or strings. The rows of strings are then collected via combiners, cables, and switchboards. The configuration of multiple rows (an array) can vary depending on the module technology, topography, spacing, mounting equipment, and other design criteria, which are subject to change during detailed design by the engineering, procurement, and construction (EPC) contractor. The strings of panels will be mounted on single-axis tracking systems described below and are expected to be separated by approximately 25 feet of open space that will be either graveled

(e.g., for access roads) or revegetated. The exact spacing between strings of panels will depend on the racking configuration and manufacturer's specifications, which will be determined during detailed design.

Figure 2 depicts the solar layout developed for purposes of analyzing impacts, using approximately 391,152 modules arranged in one-, two-, or three-string racks and 13,488 strings. The actual number of modules and their electrical configuration will vary depending on the module technology, energy output, spacing, mounting equipment, phase of the Solar Components, and other design criteria, which are subject to change during detailed design. The impact analysis throughout RFA 5 assumes all areas within the Solar Siting Area will be permanently impacted. See Section 3.4.3 for disturbance calculations.

3.1.2.2 Racking Systems

Strings of solar modules are expected to be mounted on single-axis tracker systems for all areas where panels are proposed as part of RFA 5 (see Figure 2). The single-axis tracker system optimizes electricity production by rotating the solar modules to follow the path of the sun throughout the day.

The length of each single-axis tracker string may vary by topography and the number of modules that the tracker can hold. The actual number of tracker systems and modules will depend on the racking system selected. The depicted layout in Figure 2 assumes 58 modules per two-string rack, 87 modules per three-string rack, and 116 modules per four-string rack. The drive unit for the tracking system can control a single row or multiple rows of modules through a series of mechanical linkages and gearboxes. As the solar modules tilt throughout the day, the height of their top edges will shift accordingly; due to varied terrain and equipment selection, the typical panel top edge height is expected to be 7.5 to 10 feet above the ground at maximum vertical rotation, with a maximum of 15 feet. Each set of modules is expected to be mounted approximately 5 feet off the ground on a single-axis tracker that rotates 60 degrees to the east and west. The tracker system and associated posts are expected to be specifically designed to withstand the wind, snow, and seismic loads anticipated at the site.

3.1.2.3 Foundations

Each single-axis tracking string will be supported by multiple steel posts, which could be hollow steel sections, screw piles, or pile-type posts. Post depth could vary depending on soil conditions, but the posts are typically installed 7 to 15 feet below the surface and extend approximately 5 feet above grade. Posts at the end of tracker rows (exterior) are usually installed to greater depth to withstand inclement weather including high wind conditions. In some soil conditions, concrete grouting may be used as backfill, as required. For the purposes of RFA 5, the Certificate Holder assumes that approximately 197,120 posts will be installed for the single-axis tracker system and that all of the posts may require pre-drilling and/or concrete grouting as backfill. The actual number of posts and foundation installation method may vary depending on the final tracker

system, ground coverage ratio, topography, height of the solar modules, and site-specific geological conditions. Post locations will be determined during detailed design of the tracker system and future geotechnical investigations.

3.1.2.4 Cabling

The solar modules produce DC electrical current. Cables will collect and aggregate the DC before it is converted to AC by the inverters and sent to the proposed collector substation. As currently designed for RFA 5, the DC cables will connect to inverters via a centralized trunk bus system.

Using trunk bus technology simplifies wiring across the arrays and does not require combiner boxes, substituting an aboveground aluminum trunk system that combines the functionality of cable assemblies and combiner boxes, fusing into one system. If harnesses are used, the amount of cabling will be similar to the amount of cabling used with combiner box technology, but the cables would be above ground, attached in parallel to the panel racking. The buried cables associated with the solar array will be located within the solar array fence line area and are included in the estimated total permanent impact associated with the solar array (i.e., no temporary impacts are calculated for buried cable inside the solar array fence line area).

3.1.2.5 Inverters

The solar modules will be arranged into blocks, with each block connecting via collector lines to a modular inverter enclosure. In order to be sent to the electrical grid, the DC electrical current collected from the solar modules must be converted into AC electrical current before connecting to the proposed collector substation. Inverters convert DC to AC in accordance with electrical regulatory requirements. Inverters employ several advanced control systems, switching algorithms, and ancillary services for both the input and output stages. Low-voltage cabling will link each solar module to inverters. Each solar inverter will be positioned on a concrete pad and includes an integrated step-up transformer. The combination of the inverters and transformers is sometimes referred to as a power conversion station (PCS). Figure 2 depicts a solar site plan with 54 PCS to convert the DC from the modules to AC. The final number of inverters will vary depending on the actual generation output of the solar array.

The inverter specification will comply with the applicable requirements and standards of the National Electric Code and Institute of Electrical and Electronics Engineers standards.

3.1.2.6 Inverter Step-Up Transformers

The AC power from the inverters will be routed to inverter step-up (ISU) transformers integrated into the housing skid of the inverters. The ISU transformers will increase the output voltage from the inverter (typically 660 volts) to the collector substation feed voltage (34.5-kV AC). For the purposes of analysis, the site plan in Figure 2 shows 54 PCS. Each ISU transformer will contain approximately 600 gallons of mineral oil. From the step-up transformers, the AC electricity is

aggregated via underground 34.5-kV cables to the underground collector lines (see Section 3.1.3 below).

Two generator step-up (GSU) transformers are expected to be located at the proposed collector substation to step up power from 34.5 kV to 230 kV. See Section 3.1.3.2 for additional information on the collector substation.

3.1.3 Related or Supporting Facilities

Related or supporting facilities consist of underground 34.5-kV electrical collector lines; one proposed collector substation; a 230-kV gen-tie line connection from the proposed collector substation to the Fox Canyon Substation (under construction); one BESS; O&M structures including communication and supervisory control and data acquisition (SCADA) systems; access roads, perimeter fencing, and gates; and temporary construction areas. As noted earlier, PGE is requesting flexibility for the solar modules and various associated equipment. Therefore, the following descriptions are based on the best available information at this time.

3.1.3.1 Collector Lines

The ISU transformers will connect the generation output of the solar modules to the high-capacity 34.5-kV collector lines, the majority of which will be within the solar perimeter fencing. The collector lines will carry power to the proposed collector substation.

The collector lines will be buried to a minimum of 3 feet, with junction splice boxes positioned intermittently along the lines for maintenance access. In this maximum footprint layout for analysis, approximately 103 miles of 34.5-kV collector line will be installed underground between the ISU transformers and collector substation (Figure 2).

The majority of the underground collector lines will be installed inside the Solar Siting Area fence lines. For the purposes of calculating impacts, the Certificate Holder assumes a temporary impact corridor of up to 50 feet wide (25 feet wide on average) for trench installation for underground collector line segments that are outside of the solar fence lines. Temporary impacts from collector line construction outside the facility footprint will be restored and revegetated following construction in accordance with the Comprehensive Solar Revegetation and Soil Management Plan (Exhibit C, Attachment C-2).

3.1.3.2 Collector Substation

High-voltage (HV) equipment includes a step-up transformer, HV circuit breaker, HV current transformers and voltage transformers, a packaged control building for the HV breaker and transformer equipment, HV towers, structures, and HV cabling if underground or conductors if overhead. Energy generated by the Solar Components will be sent via the 34.5-kV collection systems to the proposed collector substation. The new substation will step up the energy from 34.5 kV to 230 kV and then interconnect with the existing Biglow Canyon Substation via the approved

Fox Canyon Substation (Figure 2). The collector substation will be located in the Solar Siting Area next to the BESS. The collector substation is entirely within the Solar Siting Area and will result in permanent impacts. See Section 3.4.3 for disturbance calculations.

Two GSU transformers are expected to be located at the proposed collector substation to step up voltage from 34.5 kV to 230 kV. Additional substation equipment may include a 34.5-kV switch, 34.5-kV feeder breakers, 230-kV breaker, 230-kV switch, surge arrestors, control enclosure, metering equipment, grounding, and associated control wiring. The height of specific pieces of equipment within the substation fence line will range between approximately 8 and 25 feet above the ground surface.

3.1.3.3 Battery Energy Storage System

The precise scope of the BESS will be determined by the contractor during detailed design prior to the start of construction and is dependent on several factors, including but not limited to the availability and cost-effectiveness of suitable systems. As stated earlier, all technology described is preliminary and, while final design may differ, impacts will not exceed those analyzed in this RFA 5.

The BESS will be designed with the capability of storing up to 1,000 MWh over a duration to be determined based on final design and technology (see below for a detailed description of the proposed BESS equipment). The components associated with 1,000 MWh of BESS will include up to 305 battery units with enclosure-integrated inverters and 78 transformers. The batteries and associated equipment would be periodically augmented as needed to maintain 1,000 MWh of energy storage capability over the life of the BESS (20 years), taking into account natural degradation of the batteries over time. New batteries will be added to the facility to maintain output as older batteries degrade, and the degraded batteries will remain in place until decommissioning. Typical augmentation periods are every 4 years following the Commercial Operation Date. The location for the augmentation will be identified during the engineering phase of the project so that there is a minimal disturbance to its operation. Ground disturbances like grading will take place with the initial construction of the facility. Foundations and slabs will need to be designed and constructed at the time of augmentation to account for changes in battery technology and enclosure specifications such as weight and dimensions.

Figure 2 shows the enclosures, inverters, and transformers associated with the BESS. The impact analyses and modeling included throughout RFA 5 assesses the total number of BESS enclosures, inverters, and transformers associated with full augmentation.

PGE proposes to construct the BESS as a concentrated AC-coupled BESS yards (see Figure 2). The system will use a series of modular enclosures. Each enclosure will be placed on a concrete slab-on-grade foundation and the BESS yard area is expected to be surfaced with stone aggregate. Each enclosure will be approximately 28 feet 11 inches in length, 5 feet 5 inches in width, and 10 feet in height. The enclosures are rated for outdoor environments and hold the batteries and a battery

management system. The BESS includes a fire prevention system and cooling units within the enclosure. See Section 3.1.4 below and Exhibit M for fire prevention and control methods.

Figure 2 shows that the enclosures and associated components are grouped into an area within the Solar Siting Area, adjacent to the collector substation. The total fenced area for the BESS yards is approximately 8.7 acres, which is considered permanent disturbance. See Section 3.4.3 for temporary and permanent disturbance calculations.

Battery Type – Lithium-ion Batteries

Currently, lithium-ion (Li-ion) batteries are the most common type of utility-scale BESS technology, although other technologies are used and are being developed. Li-ion batteries are a type of rechargeable battery where lithium ions, suspended in an electrolyte, move from negative to positive electrodes and back when recharging. A variety of chemistries fall under the “Li-ion” term, each with varying performance, cost, and safety characteristics (Energy Storage Association 2022). Li-ion batteries experience degradation of performance over their useful lifespan, which depends on several factors including battery technology, rate/number of charge and discharge cycles, and temperature. Li-ion batteries typically have an expected useful life of 20 years. Li-ion batteries are generally used in utility-scale applications when rapid, short-term (minute) deployments of power are needed. For example, Li-ion batteries can smooth the fluctuating generation from solar arrays, which can vary based on time of day and cloud cover, to deliver consistent and predictable power to the grid when needed.

Li-ion battery systems are modular systems in which each module contains multiple smaller battery cells. The cells are the primary containment for the gel or liquid electrolyte materials. The module containing the cells is relatively small, generally about the size of a desktop computer processor, and serves as leak-proof secondary containment. The cells are contained within a module, which is collected in a pack, and then wired into a string, and finally into the full modular unit. The quantities per modular unit could change based on the most current model procured for the Solar Components, but the general framework is typical for utility-scale Li-ion systems. Again, the BESS will be designed with the capability of storing up to 1,000 MWh over a duration to be determined based on final design and technology.

Battery Energy Storage System Equipment

The BESS design will include, but not be limited to, the following elements:

- BESS equipment, including batteries and racks or enclosures, inverters, isolation transformers, and switchboards;
- Balance of plant equipment, which may include medium-voltage and low-voltage electrical systems, HVAC (heating, ventilation, and air conditioning) or liquid cooling systems, building auxiliary electrical systems, and network/SCADA systems;
- Cooling system, which may include a separate chiller plant integrated into a purpose-built enclosure with the battery racks, chillers, pumps, and heat exchangers; and

The battery enclosures will be placed on slab-on-grade concrete foundations. Each enclosure holds the batteries, a battery management system, and a fire prevention system. Cooling units will be placed either on top of the enclosures or along the side. By connecting multiple enclosures, the BESS can be scaled to the desired capacity during detailed design by the EPC contractor.

The BESS will include 305 inverters to convert DC power from each BESS to AC power. Additionally, the BESS will include 78 transformers to increase the output voltage from the BESS inverters (typically 660 volts) to the substation feed voltage (34.5-kV AC). Both the inverters and transformers for the BESS are anticipated to also be approximately 8 to 10 feet in height.

Battery Energy Storage System Operations and Maintenance

The batteries and other materials for the BESS will be manufactured off-site and transported to the RFA 5 Site Boundary by truck. As applicable, defective or decommissioned parts will be disposed of or recycled in compliance with 49 Code of Federal Regulations (CFR) 173 Subpart E, which regulates the transportation of batteries.

The O&M activities typically consist of minimal procedures that do not require tampering with the battery cell components. For the purposes of analysis, it is assumed the Li-ion battery system will require augmentation of the batteries throughout its 20-year life.

The BESS will be stored in completely contained, leak-proof modules, which will be inspected monthly according to the manufacturer's recommendations.

3.1.3.4 Operations and Maintenance Buildings

Proposed new O&M structures include one 60x12-foot office trailer with electricity, internet, and water facilities; one 40x15-foot control building inside the substation; and six 40x10-foot storage containers for housing spare parts and maintenance equipment and are shown in Figure 2. The O&M buildings will be steel buildings and/or prefabricated structures. There will also be space for parking, a service staging zone, and clearance area.

Potable water will be obtained from a new exempt groundwater well: local municipalities such as the City of Wasco or BCWF's existing exempt groundwater well. The sanitary sewer will be collected and treated by a new sanitary septic system. A septic system permit would be obtained from the County Public Health Department, which issues permits for septic systems in Sherman County.

3.1.3.5 Communication and SCADA System

A communication system consisting of fiber optic and copper communication lines will connect the solar area, BESS, and substation to the SCADA controls and to the internet service provider adhering to compliance requirements in place. Controls for the PV and BESS facilities will be integrated with those existing control facilities supporting the BCWF.

These communication lines will be buried or set overhead within a cable management system. Where buried, the communication lines are placed above the collector lines in the same trench. This communication system allows each solar PCS, BESS, and the substation to be monitored by a SCADA system, in the control rooms or PGE Portland offices. This system monitors these components for variables such as meteorological conditions, critical operating parameters, and power output. The solar array is controlled and monitored via the SCADA system and can be controlled remotely. SCADA software is tuned specifically to the needs of each project by the SCADA integrator or a third-party SCADA vendor. This system will be monitored 24 hours per day, 7 days per week.

3.1.3.6 Internal Access Roads, Perimeter Fencing, and Gates

The Solar Components will use existing access roads to the extent practicable. The primary route for construction-related traffic will be Interstate 84 to south on U.S. Highway 97 to Wasco, southeast on Oregon Route 206, east on either Klondike Road or the Old Wasco Heppner Highway, and then onto various County roads. Once constructed, the area within the RFA 5 Site Boundary will include new internal access roads. Approximately 17.6 miles of new access roads are expected to be constructed within the solar perimeter fencing to access infrastructure (see Figure 2). Existing roads outside the RFA 5 Site Boundary are not anticipated to require improvements or alterations.

All newly constructed roads within the RFA 5 Site Boundary will be graveled to meet load requirements for all equipment. The substation access road and BESS access roads are expected to be 20 feet in width, and all other internal access roads are expected to be 16 feet in width.

The locations of specific access points and gates will depend on the final configuration of the solar areas and related infrastructure. The perimeter fencing will have lockable vehicle access gates. As currently designed, two access gates are included for the Solar Siting Area. Additional gates may be included for emergency exits or for removal of wildlife. Chain-link perimeter fencing, up to 8 feet in height, will enclose the Solar Siting Area as shown on Figure 2. The top of the fencing for the Solar Siting Area, BESS, and proposed substation will include 1 foot of razor or barbed wire in the total 8-foot height. The length of proposed fencing will total approximately 8.5 miles.

3.1.3.7 Temporary Construction Area

During construction, temporary construction areas (laydown areas) totaling approximately 12 acres within the RFA 5 Site Boundary will be used to support construction, store supplies and equipment, and facilitate the delivery and assembly of materials and equipment (Figure 2). Depending on the pre-existing ground surface conditions, the construction area will consist of either a crushed gravel surface that will be removed following construction, crushed gravel surface that will remain following construction because that was the pre-existing surface condition, or vegetation that is left in place for which the need to revegetate would be evaluated following construction. Additional temporary construction areas may be used as determined by the construction contractor, but these would be within the solar areas considered permanent disturbance; therefore, maximum impact is evaluated in RFA 5.

3.1.4 Other Systems and Information

3.1.4.1 Fuel and Chemical Storage

The Solar Components will not require fuel or chemicals for the generation of electricity. During construction, small quantities of a few hazardous materials may be used or stored in the temporary construction yards. Such materials may include herbicides, insecticides, paint, cleaners, or solvents. None will be present in substantial, reportable quantities, and all materials will be handled in accordance with state and federal standards. When not in use, these would be stored in a secure location within the temporary construction yards.

Fuels would be the only hazardous material that may be stored in substantial quantities on-site during construction. The Certificate Holder anticipates that up to 1,000 gallons of diesel fuel and 1,000 gallons of gasoline may be kept on-site for fueling of construction equipment. The fuel will be stored in two 1,000-gallon temporary, aboveground tanks total (one diesel and one gasoline) near the main laydown area, typically near the substation and O&M building areas, within an area that provides for secondary containment. Secondary containment and refueling procedures for on-site fuel storage will follow a Spill Prevention, Control, and Countermeasures (SPCC) Plan. Secondary containment will be compliant with requirements in 40 CFR §112.7(c), which requires secondary containment for all aboveground, buried, and partially buried containers. Fuels will be delivered to the temporary construction yards by a licensed specialized tanker vehicle. The fuel tanks are expected to be filled once a week.

There will be no substantial quantities of lubricating oils, hydraulic fluid for construction equipment, or other hazardous materials maintained on-site during construction. Lubricating oil or hydraulic fluids for construction equipment will be brought in on an as-needed basis for equipment maintenance by a licensed contractor using a specialized vehicle, and waste oils removed by the same maintenance contractor. Cooling oils for the transformers will similarly arrive on an as-needed basis and transferred into the receiving components, such that none would be stored on-site. Potentially hazardous substances will not be permanently present within the construction areas in quantities that exceed Oregon State Fire Marshal Reportable Quantities (see Exhibit N).⁸

During operations, equipment including the substation GSU transformer and ISU transformers will contain oil for cooling purposes.

The primary chemical storage during operations is expected to be the GSU transformer in the substation, which will use oil for cooling. The GSU transformer is expected to be a ground-mounted unit constructed on a concrete pad with secondary spill containment traps designed to minimize the possibility of accidental leakage on soil. The concrete catchment system is typically sized to contain the amount of oil inside the transformer plus deluge water and required freeboard.

⁸ "Reportable quantity" refers to the amount of hazardous substance that has to be released into the environment before the EPA requires notification of the release to the National Response Center pursuant to the Comprehensive Environmental Release, Compensation, and Liability Act, also known as Superfund. These numerical designations are listed under 49 CFR 172.101 Appendix A, Table 1 and Table 2.

Transformers typically use mineral oil or seed oil that is considered nontoxic. Transformer coolant does not contain polychlorinated biphenyls or compounds listed as extremely hazardous by the U.S. Environmental Protection Agency (EPA). The small quantity and nontoxic nature of the oils combined with the fact that the transformer is expected to be included in secondary containment on a concrete pad will minimize risk effects of potential spills on soil. In the unlikely event of a spill, PGE will follow response measures outlined in its construction or operations SPCC Plan. As part of this plan, equipment containing oil or hazardous materials will be regularly monitored for leaks, and measures will be put in place if any are found to quickly control and remove spills. ISU transformers will use smaller quantities of biodegradable oil and will not require secondary containment.

Small quantities of lubricants, degreasers, herbicides, or other chemicals may be stored in the proposed O&M buildings. Storage of these chemicals will follow label instructions. No underground storage tanks will be installed at the proposed O&M building. No extremely hazardous materials (as defined by 40 CFR 355) are anticipated to be produced, used, stored, transported, or disposed of for the Amended Facility during operations.

While not considered an extremely hazardous material, electrolyte solution will be contained within the BESS for the Li-ion battery technology. Li-ion battery systems are modular systems that contain multiple smaller battery cells. The cells are the primary containment for the gel or liquid electrolyte materials. The module containing the cells is relatively small, generally about the size of a desktop computer processor, and serves as leak-proof secondary containment. Modules are placed in anchored racks within the steel enclosures. The risk of leaking is very low because battery cells are hermetically sealed. Electrolyte can only escape (as vapor) in the unlikely case that a battery cell ruptures, though it would be contained in the BESS steel enclosure. Note that used Li-ion batteries can sometimes be considered hazardous waste by the EPA and will be disposed of according to the most current guidelines at end of life. See Section 3.1.3.3 above for additional description and discussion of the BESS.

As further described in Exhibit N, PGE will prepare and maintain an SPCC Plan to outline preventative measures and practices to reduce the likelihood of an accidental spill, and to expedite the response to and remediation of a spill, should one occur.

3.1.4.2 Fire Prevention and Control

Exhibit M provides information on wildfire risks and prevention and describes the Certificate Holder's existing Wildfire Mitigation Plan. This section provides a summary of these topics.

Solar facilities do not pose a significant fire risk. The greatest risk of fire is during construction, when welding and metal cutting will take place, and vehicles and construction equipment may be used in areas of tall, dry grass. To prevent fires from occurring, the construction contractor will implement a number of systems and procedures. These will include requirements to conduct welding or metal cutting only in areas cleared of vegetation, and to keep emergency firefighting

equipment on-site. Construction workers will keep vehicles on roads during the dry months of the year, unless offroad activities are required for emergency purposes, in which case fire precautions will be observed. Construction workers will be prohibited from parking vehicles in areas of tall, dry vegetation to prevent fires caused by contact with hot mufflers or catalytic converters. Fire extinguishers and shovels will be kept in all vehicles. In the event of a large fire, emergency responders will be dispatched.

Fire prevention specific to solar arrays is dependent on proper installation and maintenance of electrical equipment to prevent short-circuits and consequent sparking, and reduction in fuel to reduce the chance of fire spreading. Qualified staff will be employed to install and maintain electrical equipment. The solar arrays will have shielded electrical cabling, as required by applicable code, to prevent electrical fires. All electrical equipment will meet National Electrical Code and Institute of Electrical and Electronics Engineers standards and will not pose a significant fire risk. With proper maintenance and safety checks, the electrical collection system and gen-tie lines are unlikely to cause a fire. The substrate on the ground inside the solar array fence line will be gravel where needed for maintenance and access roads or where gravel already exists, and vegetation where gravel isn't needed or already present. Weeds will be managed in accordance with the weed management procedures described in the Comprehensive Solar Revegetation and Soil Management Plan (see Exhibit C, Attachment C-2). Additional fire prevention and response measures for the BCWF as a whole, including best management practices related to worker activities, maintenance of fire suppression equipment, and coordination with the local fire district, are described in Exhibit L.

The existing roads providing access to and throughout the Existing Facility, as well as new roads proposed within the RFA 5 Site Boundary, shall be sufficiently sized for emergency vehicle access in accordance with 2022 Oregon Fire Code requirements, including Section 503 and Appendix D - Fire Apparatus Access Roads. Specifically, the new internal access roads proposed within the solar area fence lines will be 16 feet in width and the substation access and internal BESS roads will be 20 feet in width. The areas immediately around the O&M buildings, proposed substation, and BESS will be graveled, with no vegetation present. See Exhibit L for additional discussion of fire prevention measures and coordination with local emergency responders.

Smoke/fire detectors will be placed around the site and tied to the SCADA system and will contact local firefighting services. The proposed O&M buildings will have basic firefighting equipment for use on-site during maintenance activities, such as shovels, beaters, portable water for hand sprayers, fire extinguishers, and other equipment.

Battery Energy Storage System

The following paragraphs summarize the information pertinent to fire prevention and control for a BESS with Li-ion technology.

The chemicals used in Li-ion batteries are nontoxic but do present a flammability hazard. Li-ion batteries are susceptible to overheating and require cooling systems dedicated to each BESS enclosure, especially at the utility scale (LAZARD 2021). The gas released by an overheating Li-ion

cell is mainly carbon dioxide. The electrolyte solution, usually consisting of ethylene or propylene, may also vaporize and vent if the cell overheats (Battery University 2022).

The Certificate Holder will implement the following fire prevention and control methods to minimize fire and safety risks for the Li-ion batteries proposed for the BESS:

- The batteries will be stored in completely contained, leak-proof modules.
- The Li-ion battery system will be kept in a temperature-controlled facility with individual battery modules isolated to prevent the spread of fire if it were to occur. The Underwriters Laboratories (UL) 9540A test reports and supplier recommendations show that the risk of fire propagation from one enclosure to another is very low.
- Ample working space will be provided around the BESS for maintenance and safety purposes.
- Twenty-four-hour monitoring of the BESS will be implemented and will include shutdown capabilities. Batteries will shut off if any issue with cooling is detected; under an idle state, they can remain without cooling until a service technician arrives.
- Transportation of Li-ion batteries is subject to 49 CFR 173.185 – Department of Transportation Pipeline and Hazardous Material Administration. This regulation contains requirements for prevention of a dangerous evolution of heat, prevention of short circuits, prevention of damage to the terminals, and prevention of batteries coming into contact with other batteries or conductive materials. Adherence to the requirements and regulations, personnel training, safe interim storage, and segregation from other potential waste streams will minimize any public hazard related to transport, use, or disposal of batteries.
- Design of the BESS will be in accordance with applicable UL (UL 2023; specifically 1642, 1741, 1973, 9540A), National Electric Code, and National Fire Protection Association (specifically 855) standards, which require rigorous industry testing and certification related to fire safety and/or other regulatory requirements applicable to battery storage at the time of construction.
- Additionally, the Certificate Holder will employ the following design practices, as applicable to the available technology and design at time of construction:
 - Employment of an advanced and proven battery management system;
 - Qualification testing of battery systems in accordance with UL 9540A (Revision 4);
 - Installation of fire sensors, smoke and hydrogen and/or carbon monoxide detectors, alarms, emergency ventilation systems, cooling systems;
 - Employment of fire control panels with 24-hour battery backup;
 - Installation of doors that lock with restricted access to authorized personnel only;
 - Installation of thermal insulation sheets between each individual battery cell;

- Implementation of locks and fencing to prevent entry of unauthorized personnel;
- Installation of remote power disconnect switches; and
- Clear and visible signs to identify remote power disconnect switches.

3.1.5 Construction Schedule

Construction within the RFA 5 Site Boundary is expected to begin in Q3 of 2027 and continue through Q4 of 2028 for a duration of approximately 18 months. Additional engineering and geotechnical investigations may occur prior to issuance of the Amended Site Certificate. As defined in ORS 469.300(6), surveying and exploration activities (such as geotechnical investigations) are excluded from the definition of construction work. No other construction work is anticipated to begin prior to issuance of the Amended Site Certificate.

3.1.5.1 Construction Schedule Amendment Request

Existing Site Certificate Condition CON-GS-01 requires that construction of the BCWF Solar Facility as approved under RFA 4 begin by March 27, 2032. The Certificate Holder satisfied Condition 1 when it began construction on July 13, 2026. With RFA 5, the Certificate Holder proposes to expand the existing site boundary (i.e., RFA 5 Site Boundary) and add Solar Components to the BCWF and Solar Facility approved under RFA 4 (under construction). The Certificate Holder requests that, if the Council approves RFA 5, the construction commencement deadline be applied to the construction of the RFA 5 Solar Components. As is standard for initial construction commencement deadlines, the Certificate Holder requests 6 years from the effective date of the Fifth Amended Site Certificate, and a construction completion deadline 6 years from the effective date of the Fifth Amended Site Certificate to start and complete construction of the Solar Components in the Solar Siting Area.

3.2 Proposed Change Effects on Facility – OAR 345-027-0360(1)(b)(A)

(A) A description of how the proposed change affects the facility;

The BCWF, as approved, is a wind and solar energy generation and battery storage facility. In RFA 4, the Council approved the addition of solar PV, battery storage, and related or supported facilities within the existing BCWF site boundary, and the RFA 5 Solar Facility is generally the same as the RFA 4 Solar Facility. The two facilities will be managed together as a single Solar Facility during operations. However, RFA 5 proposes changes to accommodate a layout beyond the existing BCWF site boundary with increased capacity via additional solar energy and battery storage. This will allow the BCWF to respond to market needs, take advantage of available transmission capacity (namely, existing point of interconnection), and overcome the challenges posed by the intermittent nature of wind energy. The additional solar arrays will provide power to the same grid connection points and interconnect to an existing transmission line, which provides the opportunity for optimal utilization of power generation and transmission capacities. Adding more solar capacity to the BCWF will increase the maximum peak generating capacity for the Facility by up to 200 MW. This

further supports Oregon’s Clean Energy Targets bill (House Bill 2021⁹), which requires electricity providers to reduce the greenhouse gas emissions associated with electricity sold in Oregon to 100 percent below baseline emissions levels by 2040.

Although RFA 5 proposes to add to the approved BCWF site boundary, these new areas are between or adjacent to areas of the approved BCWF site boundary (see Section 3.4) and allow for the reuse of areas not used within the approved BCWF boundaries. Therefore, because of their proximity to the approved BCWF site boundary, the areas of the amended BCWF site boundary (i.e., RFA 5 Site Boundary) do not alter most of the various resource analysis areas that were reviewed in the Application for Site Certificate. In general, because of their proximity to the approved BCWF site boundary, the new areas of the RFA 5 Site Boundary have similar habitat types, topography, and land uses to the approved BCWF site boundary. Therefore, although there will be some additional impacts to certain resources resulting from the proposed modifications, these impacts will generally be similar in nature to those that have already been analyzed for the approved BCWF.

As detailed in the following sections and in the attachments, although the proposed changes provide a larger site boundary as well as new infrastructure, the Certificate Holder can still comply with all Site Certificate Conditions previously adopted by the Council for the BCWF. Minimal edits to existing Site Certificate conditions are needed to reflect the additional solar, BESS, and related facilities (see Attachment 1). Ultimately, the proposed changes will maximize use of the latest technology to minimize impacts, and increase reliability and customer value, while supporting renewable energy production in the region and helping the state meet its renewable energy goals.

3.2.1 Long-term Facility Maintenance Plan

Over the course of more than 15 years of operation at the BCWF, the Certificate Holder has encountered technical challenges that have offered valuable insights into both technical and procedural vulnerabilities and informed continuous improvement efforts. The Certificate Holder has implemented targeted improvements specific to the Facility, including changes to internal management structure and personnel, a change in the turbine O&M provider with a newly negotiated contract to mitigate future technical challenges and better align with site-specific performance goals, and improved monitoring of contractor performance. Improved preventative maintenance, robust monitoring, and corrective action planning will be the result of these ongoing changes.

The specific types of technical challenges with the Facility would be unlikely to occur with the Solar Components due to the difference in technology. Lessons learned from more than a decade of wind facility operations at BCWF are being directly integrated into the planning and management of the proposed Solar Components. Past challenges have informed the adoption of more robust preventative maintenance and corrective action protocols, improvements to vendor contracts to ensure the contracts use asset management and equipment health as the measure for vendor performance, stronger consequences for poor performance, and improved quality control and

⁹ <https://olis.oregonlegislature.gov/liz/2021R1/Downloads/MeasureDocument/HB2021/Enrolled>

assurance oversight of vendors. All of these will be standard practice for the Solar Components infrastructure. Measures such as SCADA-integrated diagnostics, third-party commissioning, fire detection and suppression systems, and secondary containment features are being incorporated from the outset to reduce risk, support long-term reliability, and maintain full compliance with site certificate conditions.

The Certificate Holder has developed an Operations and Maintenance Plan Framework for the Solar Components Approved under RFA 4 and Proposed under RFA 5 that outlines the structure of operational responsibilities, long-term maintenance protocols, quality assurance processes, environmental compliance measures, and integration with emergency response and monitoring systems (see Attachment 4). Prior to the start of operation of the RFA 4 Solar Facility, the Certificate Holder will finalize an O&M Plan based on this framework to further detail the specific actions required to operate and maintain the Solar Components. This O&M Plan will also guide O&M activities for the RFA 5 Solar Facility, since both solar facilities will be managed together as one facility during operations. Actions described in the O&M Plan Framework include:

- The integration of existing and new technical and site management plans into the solar facility O&M plan;
- Facility roles and responsibilities;
- Preventative maintenance and asset monitoring;
- Compliance, controls, and reporting;
- Emergency preparedness integration;
- Contractor and staff oversight;
- Design and equipment selection; and
- Long-term maintenance and operational continuity, including:
 - Personnel and quality assurance oversight,
 - Budget planning, and
 - Lifecycle management.

The final O&M Plan will be a living document that will be updated throughout the life of the BCWF Solar Facility to ensure proactive and effective management of the site.

3.3 Applicable Laws and Council Rules – OAR 345-027-0360(1)(b)(B)

(B) A description of how the proposed change affects those resources or interests protected by applicable laws and Council standards, and

The Certificate Holder has reviewed and considered current local, state, and federal law in developing the layout proposed with RFA 5. No laws were identified that would prohibit the proposed changes requested in RFA 5. Compliance with applicable laws is integrated into the existing and proposed modified Site Certificate Conditions, including conditions related to pre-

construction biological and cultural surveys, preparation of an archaeological monitoring plan, the National Pollutant Discharge Elimination System (NPDES) 1200-C permit, and consultation with the Oregon Department of Fish and Wildlife and Department of Geology and Mineral Industries, among others. The proposed changes do not alter the Certificate Holder's ability to comply with the Site Certificate Conditions for the BCWF except as noted in the exhibits (Attachment 5) and the proposed condition modifications and additions that address construction, operation, and retirement of the Solar Components (Attachment 1). Ultimately, although the amended BCWF may be operated in a different manner than previously approved by the Council as a result of RFA 5, substantial changes to the Fourth Amended Site Certificate are not necessary to incorporate and meet Council standards and other applicable laws. The exhibits provided in Attachment 5 further demonstrate how the proposed changes will continue to comply with Council standards and are consistent with the Council's previous findings for the BCWF.

3.4 Location of the Proposed Change – OAR 345-027-0360(1)(b)(C)

(C) The specific location of the proposed change, and any updated maps and/or geospatial data layers relevant to the proposed change;

The description in Sections 3.4.1 through 3.4.3 below is included as required to meet the submittal requirements of OAR 345-021-0010(1)(c), paragraphs (A) through (C).

3.4.1 Facility Location

The Existing Facility is located within a site boundary comprising approximately 25,000 acres, approximately 2.5 miles northeast of the town of Wasco in Sherman County, Oregon (Figure 1). The Certificate Holder proposes to expand the approved BCWF site boundary to include 839 acres, as shown on Figure 4.

3.4.2 Specific Location of Major and Supporting Facilities

The following figures show the specific location of the major and supporting facilities proposed with RFA 5.

- Figure 1 is a vicinity map showing the location of the RFA 5 Site Boundary in relation to nearby cities and towns, county boundaries, public roads, and other geographic features.
- Figure 2 provides the preliminary site plan for RFA 5 and is the basis for the permanent and temporary disturbance calculations in Table 2.
- Figure 3 shows the location of the RFA 5 Site Boundary in relation to other energy generation facilities that are known to be permitted at the state or local level within 10 miles.
- Figure 4 displays the proposed changes to the approved BCWF site boundary, which constitute the RFA 5 Site Boundary, as well as the BCWF site boundary.

Updated geospatial data layers used to create the maps in RFA 5 will be provided to ODOE on request.

3.4.3 Permanent and Temporary Disturbance Areas

Table 2 provides a maximum impact scenario for permanent and temporary disturbances associated with the RFA 5 Solar Facility, as well as any assumptions used to calculate these impact amounts. The individual component disturbance areas (for solar areas, BESS, temporary construction area, etc.) were calculated using preliminary design data and represent the Certificate Holder's best estimate of preliminary impacts for each component. Because this analysis uses the largest anticipated footprint, the final equipment and layout selected will not exceed the impacts analyzed.

Table 2 presents the impact by disturbance type. However, some disturbance types may overlap by the nature of their development. Therefore, the last row in the table provides the disturbance area with any existing development overlap removed. For purposes of analysis, the Certificate Holder considered a total solar area that will occupy up to approximately 1,186 acres enclosed within the fenced Solar Siting Area, using the proposed solar technology. This fenced area is considered permanently disturbed and includes all solar components (i.e., modules, inverters, transformers, tracking systems, posts, underground collector lines, internal access roads, and other associated equipment). All other permanent impacts are listed as separate line items and include permanent impacts from the collector substation, BESS, and O&M structures.

Table 2. Permanent and Temporary Disturbances

Disturbance Type	Permanent (Acres)	Temporary (Acres)
Solar Siting Area ¹	1,243.87	-
Gen-Tie Line (230 kV) ²	0.86	47.44
Underground Collector Lines ³	624.23	
BESS ⁴	8.73	-
O&M Structures ⁵	0.19	-
Laydown Area ⁶	-	4.40
Substation ⁷	3.10	-
Substation Access Road	1.74	-
TOTAL	1,244.10	44.09
<ol style="list-style-type: none"> 1. Permanent disturbance includes areas and infrastructure (trackers, inverters, internal roads, buildings, stormwater basins, and parking) inside the perimeter fence for the Solar Siting Area and a 30-foot buffer on the outside of the perimeter fence. Temporary disturbance is for laydown areas, collector lines, and fence line construction area. . Assumes an approximate total of 8.5 miles feet of perimeter fence for the Solar Siting Area. 2. Overhead transmission line disturbance amounts include the poles. Assumes a 150-foot temporary disturbance corridor (final corridor pending design) plus 20x20-foot pulling/tension areas (temporary disturbance), and 2-foot-diameter permanent disturbance from the poles (steel monopoles). Assumes approximately 700-foot spans between poles. 3. Temporary disturbance includes a total of 103 miles of underground collector lines and a 50-foot-wide impact corridor. 4. Permanent disturbance includes the area of the BESS structure, which is within the solar area fenceline. 		

Disturbance Type	Permanent (Acres)	Temporary (Acres)
5. Permanent disturbance for parking area, six 40-foot storage containers for housing spare parts and maintenance equipment, one 40x15-foot control building inside the substation, and one 60x12-foot office structure with electricity, internet, and water facilities. Temporary disturbance is for construction of the building and assumes a 25-foot temporary disturbance corridor located around the permanent disturbance footprint.		
6. Temporary disturbance for the laydown area for construction. No permanent disturbance; the construction area will be reclaimed following construction. Additional temporary construction areas may be used as determined by the EPC contractor, but these would be within the solar area fenceline and are already accounted for as permanent disturbance.		
7. Permanent disturbance includes all areas for the proposed collector substation, which is within the solar area fenceline.		

The total acreage covered by Solar Components includes approximately 1,244 acres in the Solar Siting Area. Areas of temporary disturbance within the fenced area will then be used to locate the facility components. The remainder of the acreage within the fenced area includes undisturbed setbacks and avoidance areas. Any temporary disturbance impacts requiring restoration and revegetation will only occur outside of the perimeter fencing for the solar areas, BESS, and collector substation and include temporary impacts from the underground collector lines, laydown areas, installation of perimeter fencing, construction of the O&M structures, gen-tie lines, and use of any additional temporary construction areas. This layout represents the maximum scenario for purposes of analyzing land use and habitat impacts.

4.0 Division 21 Requirements

OAR 345-027-0360(1)(c) References to any specific Division 21 information that may be required for the Department to make its findings;

This section includes Division 21 requirements not already included within Division 27.

Table 3. Division 22 Standards Relevant to Proposed Amendment

Standard	Exhibit
OAR 345-022-0000 General Standard of Review	Sections 3.1 – 3.4 of this document
OAR 345-022-0010 Organizational Expertise	Organizational Expertise (Exhibit A)
OAR 345-022-0020 Structural Standard	Structural Standard (Exhibit B)
OAR 345-022-0022 Soil Protection	Soil Protection (Exhibit C)
OAR 345-022-0030 Land Use	Land Use (Exhibit D)
OAR 345-022-0040 Protected Areas	Protected Areas (Exhibit E)
OAR 345-022-0050 Retirement and Financial Assurance	Retirement and Financial Assurance (Exhibit F)
OAR 345-022-0060 Fish and Wildlife Habitat	Fish and Wildlife Habitat (Exhibit G)
OAR 345-022-0070 Threatened and Endangered Species	Threatened and Endangered Species (Exhibit H)
OAR 345-022-0080 Scenic Resources	Scenic Resources (Exhibit I)

Standard	Exhibit
OAR 345-022-0090 Historic, Cultural and Archaeological Resources	Historic, Cultural and Archaeological Resources (Exhibit J)
OAR 345-022-0100 Recreation	Recreation (Exhibit K)
OAR 345-022-0110 Public Services	Public Services (Exhibit L)
OAR 345-022-0115 Wildfire Prevention and Risk Management	Wildfire Prevention and Risk Management (Exhibit M)
OAR 345-022-0120 Waste Minimization	Waste Minimization (Exhibit N)
OAR 345-022-0130 State and Local Laws and Regulations	State and Local Laws and Regulations, including Noise, Wetlands and Waters, and Water Use (Exhibit O)

4.1 Property Owner Information – OAR 345-021-0010(3)(c)

OAR 345-021-0010(3)(c) A list of the names and mailing addresses of property owners, as described in this subsection:

(A) The list must include all owners of record, as shown on the most recent property tax assessment roll, of property located:

(i) Within 100 feet of property which is the subject of the application, where the subject property is wholly or in part within an urban growth boundary;

(ii) Within 250 feet of the property which is the subject of the application, where the subject property is outside an urban growth boundary and not within a farm or forest zone; or

(iii) Within 500 feet of the property which is the subject of the application, where the property is within a farm or forest zone.

(B) The applicant must submit an updated list of property owners as requested by the Department before the Department issues notice of any public hearing on the application for a site certificate as described in OAR 345-015-0220; and

(C) In addition to incorporating the list in the application, the applicant must submit the list to the Department in an electronic format approved by the Department.

The Site Boundary is described in detail in Section 2. Attachment 2 includes the names and mailing addresses of all landowners of record within the notification area as defined by OAR 345-21-0010(1)(c)(A). The Applicant will update Attachment 2 within 60 days of the public hearing. An Excel spreadsheet of Attachment 2 has also been included with this submittal.

4.2 Applicable Statutes, Rules, and Local Government Ordinances – OAR 345-021-0010(3)(d)

Identification, by legal citation, of all state statutes and administrative rules and local government ordinances containing standards or criteria that the proposed facility must meet

for the Council to issue a site certificate, other than statutes, rules and ordinances identified in OAR 345-022-0010(c), and identification of the agencies administering those statutes, administrative rules and ordinances. The applicant must identify all statutes, administrative rules and ordinances that the applicant knows to be applicable to the proposed facility, even if not identified in the project order. To the extent not addressed by other materials in the application, the applicant must include a discussion of how the proposed facility meets the requirements of the applicable statutes, administrative rules and ordinances.

4.2.1 Applicable Rules and Ordinances

Table 4 identifies by legal citation and relevant administering agency the state statutes and administrative rules and local government ordinances referenced in other exhibits, with the exception of those presented in Section 4.3 below, which addresses OAR 345-021-0010(3)(e). The identified statutes, rules, and ordinances contain standards or criteria that the RFA 5 Facility, as proposed in RFA 5, must meet for the Council to amend the Facility's Site Certificate.

Table 4. Statutes, Rules, and Local Ordinances Referenced in Other Exhibits

Administering Agency	Agency Address	Legal Citation	Relevant Exhibit
Oregon Department of Agriculture	Oregon Department of Agriculture 635 Capitol Street, NE Salem, OR 97301 (503) 986-4550	Native Plant Conservation Program (Oregon Revised Statutes) ORS Chapter 564 (Wildflowers, Threatened or Endangered Plants); OAR Chapter 603, Division 73 (Plants: Wildflowers and Endangered, Threatened and Candidate Species)	Exhibit H
Oregon Department of State Lands	Oregon Department of State Lands 775 Summer Street NE, Suite 100 Salem, OR 97301 (503) 986-5200	33 Code of Federal Regulations (CFR) § 328; ORS Chapters 196 and 390; OAR Chapter 141	Exhibit O
Oregon Department of Environmental Quality	Oregon Department of Environmental Quality 400 E Scenic Drive, Suite 307 The Dalles, OR 97058 (541) 298-7255	Noise Regulations ORS 467.020 and ORS 467.030 (Noise Control) and OAR Chapter 340, Division 35 (Noise Control Regulations)	Exhibits E, O3
	Oregon Department of Environmental Quality 400 E Scenic Drive, Suite 307 The Dalles, OR 97058 (541) 298-7255	OAR 345-022-0120 Waste Minimization; Solid Waste Management ORS Chapter 459 (Solid Waste Management) and OAR Chapter 340, Division 93 (Solid Waste General Provisions) ORS Chapters 465 and 466 (Hazardous Waste and Hazardous Materials I and II); and OAR Chapter 340, Divisions 45, 47, 108, 100 through 122, 150, and 160 (Hazardous Waste Management); 40 CFR Parts 110, 122, 262, 265, 280, 302, 355, and 761	Exhibit N

Administering Agency	Agency Address	Legal Citation	Relevant Exhibit
Oregon Department of Fish and Wildlife – Habitat Conservation Division	Oregon Department of Fish and Wildlife – The Dalles Field Office 3561 Klindt Drive The Dalles, OR 97058 (541) 296-8026	Fish and Wildlife Habitat Mitigation Policy ORS 496; OAR Chapter 635, Divisions 100 and 415 (Fish and Wildlife Habitat Mitigation Policy)	Exhibits G, H, O1
	Oregon Department of Fish and Wildlife – The Dalles Field Office 3561 Klindt Drive The Dalles, OR 97058 (541) 296-8026	State Threatened and Endangered Species OAR Chapter 625, Division 100 (Wildlife Diversity Plan) and OAR 635-044-0130	Exhibit H
Oregon Department of Land Conservation and Development	Oregon Department of Land Conservation and Development 635 Capital Street NE, Suite 150 Salem, OR 97301 (503) 373-0050	OAR 345-022-0030(2) and (3) Land Use; Oregon Statewide Planning Goals, applicable sections of OAR Chapter 660, applicable substantive criteria of the Sherman County Comprehensive Plan and land use ordinances, and any exceptions to the same may be granted by EFSC under OAR 345-022-0030(4).	Exhibit D
Oregon Department of Land Conservation and Development	Oregon Department of Land Conservation and Development 635 Capital Street NE, Suite 150 Salem, OR 97301 (503) 373-0050	ORS Chapters 195, 215, and 469	Exhibit D
Oregon Office of State Fire Marshal	Oregon Office of State Fire Marshal 3991 Fairview Industrial Drive SE Salem, OR 97302 (503) 378-3473	2022 Oregon Fire Code	Background Exhibit
Oregon Department of Transportation Commerce and Compliance Division	Oregon Department of Transportation Commerce and Compliance Division 455 Airport Road SE, Building A Salem, OR 97301 (503) 378-5849	49 CFR 173	Background Exhibit and Exhibit L

Administering Agency	Agency Address	Legal Citation	Relevant Exhibit
Oregon Parks and Recreation Department, State Historic Preservation Office – Archaeological	Oregon State Historic Preservation Office 725 Summer St NE, Suite C Salem, OR 97301 (503) 986-0690	ORS Chapter 358	Exhibit J
Oregon Public Utility Commission	Oregon Public Utility Commission 201 High Street SE, Suite 100 Salem, OR 97301 (503) 378-6600	OAR 345-022-0115 Wildfire Prevention and Risk Mitigation; OAR Chapter 860	Exhibit M
Sherman County Planning Department	Sherman County Planning Department 66365 Lonerock Road Moro, OR 97039 (541) 565-3601	Sherman County Zoning Ordinance	Exhibit D

4.2.2 Need Standard for Nongenerating Facilities – OAR 345, Division 23

OAR 345-023-0005 – Need for Facility. This division applies to nongenerating facilities as defined in ORS 469.503(2)(e), except nongenerating facilities that are related or supporting facilities. To issue a site certificate for a facility described in sections (1) through (3), the Council must find that the applicant has demonstrated the need for the facility. The Council may adopt need standards for other nongenerating facilities. This division describes the methods the applicant shall use to demonstrate need. In accordance with ORS 469.501(1)(L), the Council has no standard requiring a showing of need or cost-effectiveness for generating facilities. The applicant shall demonstrate need:

- (1) For electric transmission lines under the least-cost plan rule, OAR 345-023-0020(1), or the system reliability rule for transmission lines, OAR 345-023-0030, or by demonstrating that the transmission line is proposed to be located within a “National Interest Electric Transmission Corridor” designated by the U.S. Department of Energy under Section 216 of the Federal Power Act;*
- (2) For natural gas pipelines under the least-cost plan rule, OAR 345-023-0020(1), or the economically reasonable rule for natural gas pipelines, OAR 345-023-0040;*
- (3) For storage facilities for liquefied natural gas with storage capacity of three million gallons or greater under the least-cost plan rule, OAR 345-023-0020(1), or the economically reasonable rule for liquefied natural gas storage facilities, OAR 345-023-0040.*
- (4) If the proposed facility is a non-generating facility for which the applicant must demonstrate need under OAR 345-023-0005, the applicant must submit information about the need for the facility, providing evidence to support a finding by the Council as required by OAR 345-023 0005(1)-(3), including identification of the rule in Division 23 of this chapter under which the applicant chooses to demonstrate need.*

Not applicable. The Facility is not a nongenerating facility.

4.3 Specific Standards – OAR 345-021-0010(3)(e)

OAR 345-021-0010(3)(e) 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:

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

The proposed 230-kV gen-tie lines will total approximately 2.7 miles length and do not constitute energy facilities under Council jurisdiction as defined by ORS 469.300 because they do not cross more than one city or county and are not greater than 10 miles in length. However, the gen-tie lines are classified as related or supporting facilities to the solar energy facility that is under Council jurisdiction.

4.3.1 Siting Standards for Transmission Lines

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;*

The proposed 230-kV gen-tie line is not a transmission line under Council jurisdiction; however, the Certificate Holder is voluntarily addressing this standard. The Electromagnetic Field (EMF) Study in Attachment 3 provides modeling results for AC electric fields and demonstrates that these electric fields do not exceed 9 kilovolts/meter (kV/m).

- (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.*

Electric currents can be induced by electric and magnetic fields in conductive objects near transmission lines. In particular, the concern is for very long objects parallel and close to the line. The primary concern is the potential for small electric currents to be induced by electric fields in metallic objects close to transmission lines. Metallic roofs, farming equipment and large vehicles, vineyard trellises, and fences are examples of objects that can develop a small electric charge in proximity to high-voltage transmission lines. Object characteristics, degree of grounding, and electric field strength affect the amount of induced charge. An electric current can flow when an object has an induced charge and a path to ground is presented. The amount of current flow is determined by the impedance of the object to ground and the voltage induced between the object and ground. The amount of induced current that can flow is important to evaluate because of the potential for nuisance shocks.

A common induced voltage hazard occurs when wire fences parallel overhead transmission lines. If the fence is ungrounded, it possesses the voltage of the net electric field of the overhead conductors at the location of the fence. A person touching such a fence becomes a conducting path for the current to flow to ground and will feel a momentary shock. The AC static voltage on the fence bleeds off quickly but can be annoying. This hazard is easily removed by bonding the fence wires along the length of the fence to grounding rods that are driven into the soil. Existing wire fences that run parallel to proposed transmission lines shall be bonded as necessary.

Induced currents from 230-kV or 34.5-kV transmission line magnetic fields are typically not a hazard because almost no voltage is involved. A current-carrying conductor will induce a current to flow in another conductor that is parallel to it. Induced currents result from the net alternating current magnetic field. In the common case of grounded fences, electrical loops can be created in which induced currents can flow. The value of the induced current will depend on the magnetic field strength; the size, shape, and location of the conducting object; and the object-to-ground resistance.

It will be a rare situation for the ideal conditions to occur (a large metallic object that is perfectly insulated from the ground, located in the highest calculated electric field of approximately 3.0 kV/m within the right-of-way, and touched by a perfectly grounded person) where the possibility of a perceived nuisance shock could occur. The calculated electric field for the following lines are as follows:

- RFA 5 Site Boundary gen-tie (stand-alone) – 0.091 and 0.081 kV/m at 200 feet of centerline
- RFA 5 Site Boundary gen-tie (next to existing overhead line) – 0.072 and 0.059 kV/m at 300 feet of centerline

These fields at 200 or 300 feet of the centerline and beyond will be sufficiently low enough that nuisance shocks should not occur. Note that there are no aboveground collector lines proposed; thus, all electric fields from the underground cables are shielded within the cable and by the surrounding soil and therefore are not externally detectable.

The calculated maximum magnetic fields for the following lines are as follows:

- RFA 5 Site Boundary gen-tie (stand-alone) – 53.11 milligauss
- RFA 5 Site Boundary gen-tie (next to existing overhead line) – 191.47 milligauss

These fields are sufficiently low and induced current in a metallic object should not occur. Note that the proposed transmission line is located within the RFA 5 Site Boundary.

(3) If the proposed energy facility is a transmission line or has, as a related or supporting facility, a transmission line of any size, the applicant must submit the following:

(a) Information about the expected electric and magnetic fields, including:

(A) The distance in feet from the proposed center line of each proposed transmission line to the edge of the right-of-way;

(B) The type of each occupied structure, including but not limited to residences, commercial establishments, industrial facilities, schools, daycare centers and hospitals, within 200 feet on each side of the proposed center line of each proposed transmission line;

(C) The approximate distance in feet from the proposed center line to each structure identified in (3);

(D) At representative locations along each proposed transmission line, a graph of the predicted electric and magnetic fields levels from the proposed center line to 200 feet on each side of the proposed center line;

(E) Any measures the applicant proposes to reduce electric or magnetic field levels;

(F) The assumptions and methods used in the electric and magnetic field analysis, including the current in amperes on each proposed transmission line; and

(G) The applicant's proposed monitoring program, if any, for actual electric and magnetic field levels.

(b) An evaluation of alternate methods and costs of reducing radio interference likely to be caused by the transmission line in the primary reception area near interstate, U.S. and state highways.

Section 2.0 of the EMF Report in Attachment 3 addresses these requirements.

5.0 Site Certificate Revisions – OAR 345-027-0360(1)(d)

OAR 345-027-0360(1)(d) The specific language of the site certificate, including conditions, that the certificate holder proposes to change, add, or delete through the amendment;

A redlined Site Certificate is included as Attachment 1. Generally, the proposed changes to language in the Site Certificate include amending certain conditions to address updated information. No new conditions are proposed for RFA 5. The proposed changes are presented in Attachment 1 and generally summarized below:

- Modifications to incorporate the Certificate Holder’s proposed amendments to the Biglow Canyon Wind Farm and RFA 4 Solar Facility. These changes include amending the BCWF and RFA 4 Solar Facility description to incorporate the RFA 5 Solar Components and gen-tie transmission line, increasing the peak generating capacity for solar energy generation, increasing the area of solar photovoltaic energy generation, adding battery energy storage, and modifying the construction start and completion dates.
- Modifications requested by the Certificate Holder for clarity, scrivener error correction, or to reflect updated information.

6.0 Other Standards and Permits – OAR 345-027-0360(1)(e)

OAR 345-027-0060(1)(e) A list of all Council standards and other laws, including statutes, rules and ordinances, applicable to the proposed change, and an analysis of whether the facility, with the proposed change, would comply with those applicable laws and Council standards. For the purpose of this rule, a law or Council standard is “applicable” if the Council would apply or consider the law or Council standard under OAR 345-027-0375(2); and

A list of statutes, administrative rules, and local government ordinances relevant to amending the Site Certificate for the BCWF is provided in Section 4.2 above. No additional statutes, rules, or ordinances need to be added based on the proposed changes.

Council standards relevant to RFA 5 include Division 22 (General Standards for Siting Facilities) and Division 24 (Specific Standards for Siting Facilities). Division 23, which applies to non-generating facilities, does not apply to solar power generating facilities. Similarly, inapplicable provisions of Division 24 (e.g., standards applicable to gas plants, gas storage, non-generating facilities) are not discussed.

The BCWF as amended by RFA 5 would comply with applicable laws and Council standards. The proposed changes to the BCWF do not alter the basis for the Council’s earlier findings for the BCWF. The primary purpose of RFA 5 is to increase the amount of non-emitting energy generation provided by the facility, and the addition of battery storage to maximize reliability and customer value and to help achieve Oregon’s ambitious decarbonization targets. Table 5 identifies Council standards and other laws reviewed as part of RFA 5 and their applicability to RFA 5. The BCWF will comply with all existing applicable Site Certificate Conditions, with proposed modifications as identified in Attachment 1. The appended exhibits (see Attachment 5) contain the information necessary for the Council to find that the BCWF, with the proposed changes, continues to meet the standards of the relevant laws.

Table 5. Standards and Laws Relevant to Proposed Amendment

Standard	Applicability and Compliance
OAR 345-022-0000 General Standard of Review	Applicable and complies. The Council previously found that the BCWF complies with the General Standard of Review. The BCWF, as amended, continues to comply with the requirements of the Council siting statutes and standards. The changes proposed with RFA 5 will not result in any significant impacts to resources. In most cases, impacts to resources resulting from the proposed changes will be similar to what has already been approved for the BCWF. RFA 5 does not alter the Certificate Holder’s ability to comply with the Site Certificate Conditions.
OAR 345-022-0010 Organizational Expertise	Applicable and complies. The Council has previously found that the Certificate Holder has the ability to construct, operate, and retire the BCWF. RFA 5 does not alter the Certificate Holder’s ability to comply with the Site Certificate Conditions. See Exhibit A in Attachment 5 for accompanying analysis.
OAR 345-022-0020 Structural Standard	Applicable and complies. As part of RFA 5, analysis was completed to incorporate and/or reference information, analysis, and findings from previous geotechnical investigations performed for the areas within the Amended Site Boundary in addition to new geotechnical investigations completed in the RFA 5 Site Boundary to demonstrate that RFA 5 does not alter the Certificate Holder’s ability to comply with applicable Site Certificate Conditions or applicable laws, standards, and rules. See Exhibit B in Attachment 5 for accompanying analysis.
OAR 345-022-0022 Soil Protection	Applicable and complies. Permanent and temporary disturbance will occur as a result of the components proposed in RFA 5, including the solar modules, BESS, and proposed substation. RFA 5 does not alter the Certificate Holder’s ability to comply with the Site Certificate conditions. See Exhibit C in Attachment 5 for accompanying analysis and Section 3.4.3 for anticipated temporary and permanent disturbance impacts.
OAR 345-022-0030 Land Use	Applicable and complies with applicable substantive criteria from the Sherman County Zoning Ordinance. The BCWF, as amended, will not force a significant change in accepted farm practices, nor will it significantly increase the cost of farm practices. RFA 5 includes a request for a Goal 3 exception to allow inclusion of the solar energy generation facility on agricultural land but does not otherwise alter the Certificate Holder’s ability to comply with the Site Certificate Conditions. See Exhibit D in Attachment 5 for accompanying analysis and Section 3.4.3 for anticipated temporary and permanent disturbance impacts.

Standard	Applicability and Compliance
OAR 345-022-0040 Protected Areas	Applicable and complies. Visual, noise, and traffic impacts were reviewed for the proposed changes. RFA 5 does not alter the Certificate Holder's ability to comply with the Site Certificate Conditions. See Exhibit E in Attachment 5 for accompanying analysis which identifies no significant impacts to protected areas.
OAR 345-022-0050 Retirement and Financial Assurance	Applicable and complies. With the proposed changes, the Certificate Holder is still able to restore the site to a useful, nonhazardous condition following permanent cessation of construction or operation of the amended BCWF. RFA 5 does not alter the Certificate Holder's ability to comply with the Site Certificate Conditions. See Exhibit F in Attachment 5 for accompanying analyses.
OAR 345-022-0060 Fish and Wildlife Habitat	Applicable and complies. The RFA 5 Site Boundary is in areas surveyed for fish and wildlife habitat as documented in Exhibit G. The Biglow Solar Habitat Mitigation Plan has been created to address the layout of the Solar Components and will be finalized after final design to account for impacts per Condition 61. RFA 5 does not alter the Certificate Holder's ability to comply with the Site Certificate Conditions. See Exhibit G in Attachment 5 for the accompanying analysis.
OAR 345-022-0070 Threatened and Endangered Species	Applicable and complies. The BWCF, as amended, will be constructed within the RFA 5 Site Boundary, where impacts to threatened and endangered species have been reviewed. RFA 5 will not cause a significant reduction in the likelihood of survival or recovery of state listed or endangered plant and animal species and does not alter the Certificate Holder's ability to comply with the Site Certificate Conditions. See Exhibit H in Attachment 5 for the accompanying analysis.
OAR 345-022-0080 Scenic Resources	Applicable and complies. Scenic resources and associated visual impacts, as applicable, were reviewed for the Solar Components. The components proposed in RFA 5, including the solar modules, BESS, and related infrastructure, have no adverse impacts on identified scenic resources and does not alter the Certificate Holder's ability to comply with the Site Certificate Conditions. See Exhibit I in Attachment 5 for accompanying analysis.
OAR 345-022-0090 Historic, Cultural and Archaeological Resources	Applicable and complies. A cultural resources survey was conducted in June and July 2024 for all areas where ground disturbance may occur as part of RFA 5. Some of these areas had previously been surveyed in 2016. Identified resources will be protected per Site Certificate Conditions and Inadvertent Discovery Plan. RFA 5 does not alter the Certificate Holder's ability to comply with the Site Certificate Conditions. See Exhibit J in Attachment 5 for accompanying analysis.
OAR 345-022-0100 Recreation	Applicable and complies. The components proposed in RFA 5, including the solar modules, BESS, and related infrastructure, have no adverse impacts on recreational opportunities and do not alter the Certificate Holder's ability to comply with the Site Certificate Conditions. See Exhibit K in Attachment 5 for accompanying analysis.
OAR 345-022-0110 Public Services	Applicable and complies. The proposed changes are not anticipated to substantially increase the demand on public services generated by the BCWF. RFA 5 does not alter the Certificate Holder's ability to comply with the Site Certificate Conditions. See Exhibit L in Attachment 5 for accompanying analysis.
OAR 345-022-0115 Wildfire Prevention and Risk Mitigation	Applicable and complies. The design, construction, and operation of the amended BCWF, taking into account mitigation, is not likely to result in significant adverse impacts to areas subject to a heightened risk of wildfire or high-fire consequence areas addressed under OAR 345-022-0115. See Exhibit M in Attachment 5 for accompanying analysis.

Standard	Applicability and Compliance
OAR 345-022-0120 Waste Minimization	Applicable and complies. The Certificate Holder will minimize the generation of solid waste and wastewater and to recycle or reuse solid waste and wastewater. RFA 5 does not alter the basis for the Council's prior findings regarding waste minimization and does not alter the Certificate Holder's ability to comply with the Site Certificate Conditions. See Exhibit N in Attachment 5 for accompanying analysis.
OAR 345-024-0010 Public Health and Safety Standards for Wind Energy Facilities	These standards do not apply.
OAR 345-024-0015 Siting Standards for Wind Energy Facilities	These standards do not apply.
OAR 345-024-0090 Transmission Lines	Applicable and complies. The components proposed in RFA 5, including the solar modules, BESS, and related infrastructure, will ensure public health and safety with respect to electromagnetic frequencies and AC electric fields, and induced currents comply with specific standards for transmission lines. RFA 5 does not alter the Certificate Holder's ability to comply with the Site Certificate Conditions. See Section 4.3.1 above for accompanying analysis.
OAR 340-035-0035 Noise Control Regulations	Applicable and complies. The Certificate Holder modeled noise generating components proposed with RFA 5, and the results show the Solar Components will comply with noise requirements in OAR 340-035-0035. RFA 5 does not alter the Certificate Holder's ability to comply with the Site Certificate conditions. See Exhibit O in Attachment 5 for accompanying analysis.
Removal-Fill Law	Applicable and complies. A removal-fill permit is not needed for the Solar Components because the proposed changes will not temporarily or permanently impact waters of the State. RFA 5 does not alter the Certificate Holder's ability to comply with the Site Certificate conditions. See Exhibit O in Attachment 5 for accompanying analysis.
Water Rights	Applicable and complies. The anticipated construction water demand from the amended BCWF will be more than the amount previously anticipated for the existing BCWF as currently approved; however, the Certificate Holder provided information showing that municipal providers or other water sources can accommodate the additional water use. RFA 5 does not alter the basis for the Council's prior findings regarding water rights and does not alter the Certificate Holder's ability to comply with the Site Certificate Conditions. See Exhibit O in Attachment 5 for accompanying analysis.

7.0 Property Owner Information

OAR 345-027-0060(1)(f) A list of the names and mailing addresses of property owners, as described in this rule:

(A) The list must include all owners of record, as shown on the most recent property tax assessment roll, of property located:

(i) Within 100 feet of property which the subject of the request for amendment, where the subject property is wholly or in part within an urban growth boundary;

(ii) Within 250 feet of property which is the subject of the request for amendment, where the subject property is outside an urban growth boundary and not within a farm or forest zone; or

(iii) Within 500 feet of property which is the subject of the request for amendment, where the subject property is within a farm or forest zone; and

(B) In addition to incorporating the list in the request for amendment, the applicant must submit the list to the Department in an electronic format acceptable to the Department.

A property owner list and accompanying map are provided as part of Attachment 2. An updated list will be provided when requested by ODOE to represent most current property ownership details at the time the RFA is finalized.

8.0 References

Battery University. 2022. BU-304a: Safety Concerns with Li-ion. February 2022.

http://batteryuniversity.com/learn/article/safety_concerns_with_li_ion.

Energy Storage Association. 2022. Lithium Ion (LI-ION) Batteries. <http://energystorage.org/energy-storage/technologies/lithium-ion-li-ion-batteries>.

LAZARD. 2021. Lazard's Levelized Cost of Storage—Version 7.0.

<https://www.lazard.com/media/42dnsswd/lazards-levelized-cost-of-storage-version-70-vf.pdf>.

Figures

**Biglow Canyon
Wind Farm Request
for Amendment #5**

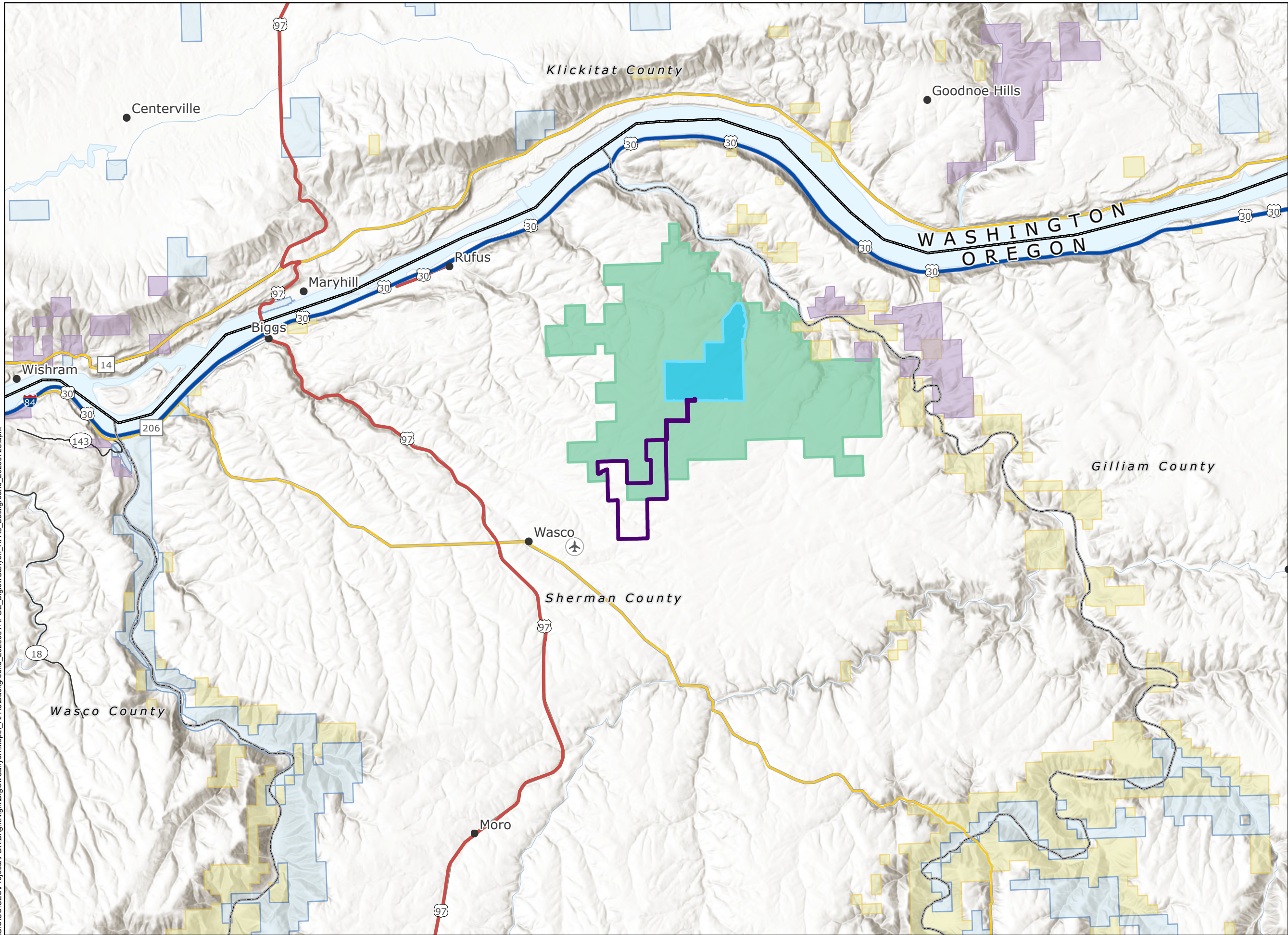
**Figure 1
Vicinity Map**

SHERMAN COUNTY, OR

- RFA5 Site Boundary
- Biglow Canyon Wind Farm, Operating
- Approved Biglow Solar Facility
- Airport
- State Boundary
- County Boundary
- City/Town
- Interstate Highway
- US Highway
- State Highway
- County Highway
- American Indian Reservation
- Bureau of Land Management
- State
- Private



Reference Map

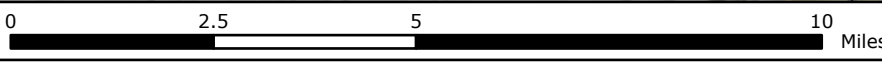


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WGS 1984 UTM Zone 10N



NOT FOR CONSTRUCTION

**Biglow Canyon
Wind Farm Request
for Amendment #5**

**Figure 2
Facility Layout**

SHERMAN COUNTY, OR

- Map Grid
- RFA5 Site Boundary
- RFA4 Gen-tie Line (230kV)
- Gen-tie Line (230kV)
- BESS
- Existing Biglow Canyon Substation
- O&M Building
- Substation
- Fox Canyon Substation (RFA4)
- Solar Siting Area
- Biglow Canyon Wind Farm, Operating
- Approved Biglow Solar Facility



Reference Map

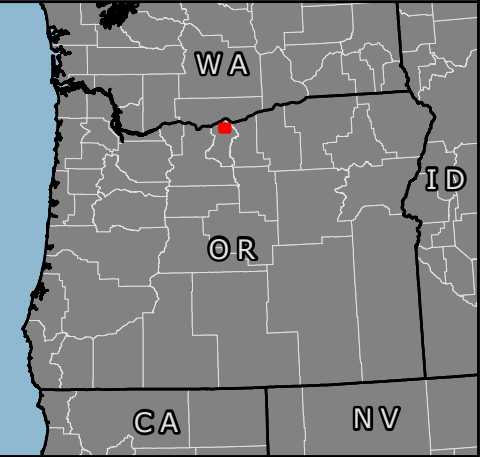


Figure 2.1

Figure 2.2



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Biglow Canyon Wind Farm Request for Amendment #5

**Figure 2.1
Facility Layout**

SHERMAN COUNTY, OR

- RFA5 Site Boundary
- Local Roads
- RFA4 Gen-tie Line (230kV)
- Gen-tie Line (230kV)
- Substation Access Road
- Access Roads
- Inverter
- BESS
- Laydown Yard
- Existing Biglow Canyon Substation
- O&M Building
- Substation
- Fox Canyon Substation (RFA4)
- Solar Tracker
- Solar Siting Area
- Biglow Canyon Wind Farm, Operating
- Approved Biglow Solar Facility



Reference Map

**Figure
2.1**

**Figure
2.2**



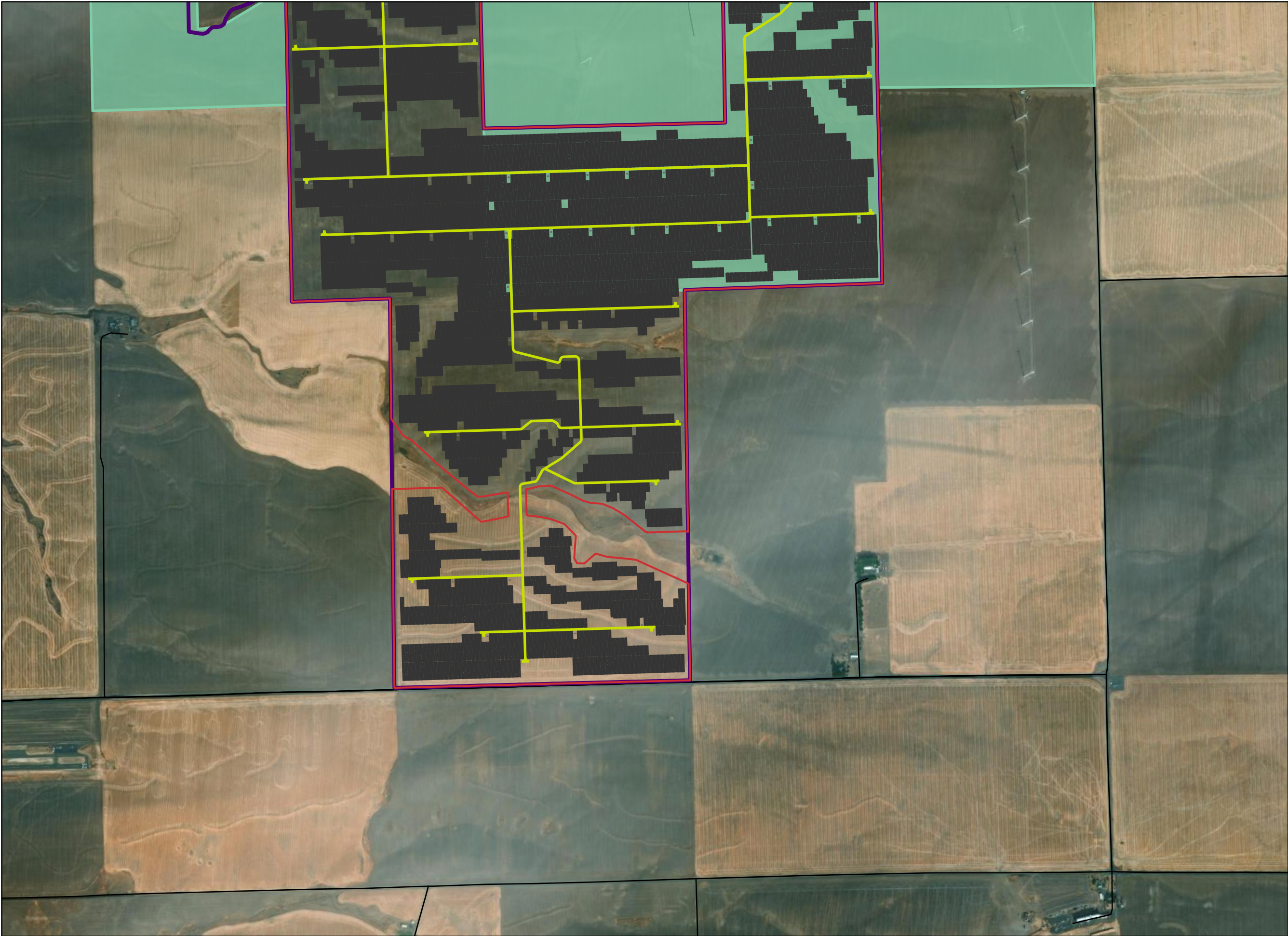
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Biglow Canyon Wind Farm Request for Amendment #5

Figure 2.2
Facility Layout

SHERMAN COUNTY, OR

- RFA5 Site Boundary
- Local Roads
- Substation Access Road
- Access Roads
- Inverter
- BESS
- Laydown Yard
- Existing Biglow Canyon Substation
- O&M Building
- Substation
- Solar Tracker
- Solar Siting Area
- Biglow Canyon Wind Farm, Operating



Reference Map

Figure
2.1

Figure
2.2



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WGS 1984 UTM Zone 10N

0 0.5 1 Mile

NOT FOR CONSTRUCTION

Biglow Canyon Wind Farm Request for Amendment #5

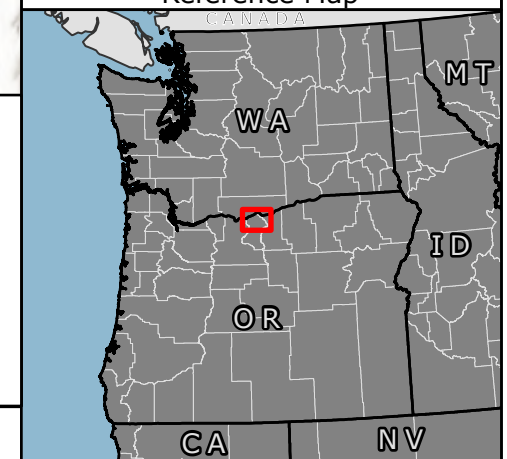
Figure 3
Energy Facilities within 10 miles

SHERMAN COUNTY, OR

- RFA5 Site Boundary
- Analysis Area (10-mile Buffer)
- State Boundary
- County Boundary
- City/Town
- Interstate Highway
- US Highway
- State Highway
- RFA4 Gen-tie Line (230kV)
- Gen-tie Line (230kV)
- Biglow Canyon Point of Interconnection
- Existing Transmission Lines
 - Under 100 kV
 - 101 - 230 kV
 - Greater than 230 kV



Reference Map



Oregon Energy Facility Siting Council Facilities

- Biglow Canyon Wind Farm, Operating
- Approved Biglow Solar Facility
- Golden Hills Wind Project, Operating
- Klondike III Wind Project, Operating

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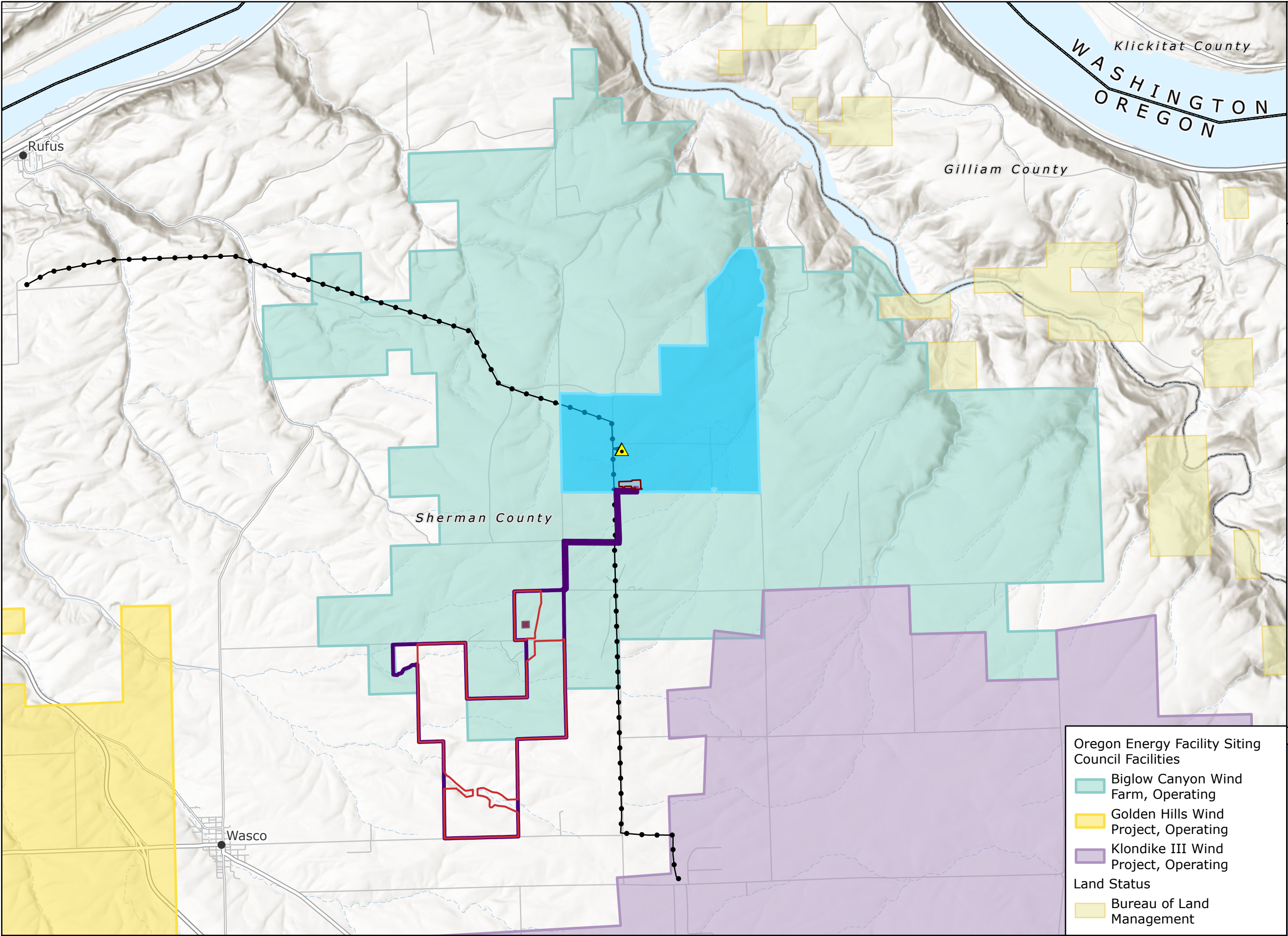
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WGS 1984 UTM Zone 10N

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Biglow Canyon Wind Farm Request for Amendment #5

Figure 4
Area Subject to Request
for Amendment 5

SHERMAN COUNTY, OR

- RFA5 Site Boundary
- State Boundary
- County Boundary
- City/Town
- Existing Transmission Lines (230-kV)
- Existing Biglow Canyon Substation
- Proposed RFA5 Substation
- Solar Siting Area
- Approved Biglow Solar Facility
- Fox Canyon Substation (RFA4)



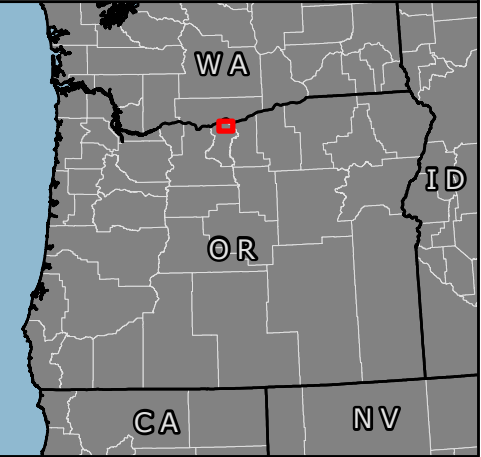
Oregon Energy Facility Siting Council Facilities

- Biglow Canyon Wind Farm, Operating
- Golden Hills Wind Project, Operating
- Klondike III Wind Project, Operating

Land Status

- Bureau of Land Management

Reference Map



1:60,000

WGS 1984 UTM Zone 10N

0 1 2 4 Miles

NOT FOR CONSTRUCTION

Attachment 1. Fifth Amended Site Certificate

**ENERGY FACILITY SITING COUNCIL
OF THE STATE OF OREGON**

**~~FOURTH-FIFTH~~ AMENDED SITE CERTIFICATE FOR THE
BIGLOW CANYON WIND FARM**

ISSUANCE DATES

Site Certificate	June 30, 2006
First Amended Site Certificate	November 3, 2006
Second Amended Site Certificate	May 10, 2007
Third Amended Site Certificate	October 31, 2008
Fourth Amended Site Certificate	March 27, 2026
Fifth Amended Site Certificate	[Date], 2027

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1.0 Introduction

This site certificate for the Biglow Canyon Wind Farm (“Biglow” or the “facility”) is issued and executed in the manner provided by ORS Chapter 469, by and between the State of Oregon (“State”), acting by and through its Energy Facility Siting Council (the “Council”), and Portland General Electric Company (“certificate holder”). This site certificate is a binding agreement between the State, acting by and through the Council, and the certificate holder. [Amendment #1]

The findings of fact, reasoning and conclusions of law underlying the terms and conditions of this site certificate are set forth in the following documents related to the facility, which are incorporated herein by this reference: (a) the Council’s Final Order in the Matter of the Application for a Site Certificate for the Biglow Canyon Wind Farm (the “Final Order on the Application”); (b) the Council’s Final Order on Amendment #1; (c) the Council’s Final Order on Amendment #2; (d) the Council’s Final Order on Amendment #3; ~~and~~ (e) the Council’s Final Order on Amendment #4; ~~and~~ (f) the Council’s Final Order on Amendment #5. [Amendments #1, #2, #3~~and~~, #4, and #5]

In interpreting this site certificate, any ambiguity shall be clarified by reference to the following, in order of priority: (1) ~~this Fifth Amended Site Certificate~~; (2) ~~the Final Order on Amendment #5~~; (3) ~~this~~ Fourth Amended Site Certificate; ~~(24)~~ the Final Order on Amendment #4; ~~(35)~~ the Final Order on Amendment #3; ~~(46)~~ the Final Order on Amendment #2; ~~(57)~~ the Final Order on Amendment #1; ~~(68)~~ the Final Order on the Application; and ~~(69)~~ the record of the proceedings that led to the Final Orders on the Application, Amendment #1, Amendment #2, Amendment #3, ~~and~~ Amendment #4, ~~and~~ Amendment #5. [Amendments #1, #2, #3~~and~~, #4, and #5]

The terms used in this site certificate shall have the same meaning as set forth in ORS 469.300 and OAR 345-001-0010, except where otherwise stated or where the context clearly indicates otherwise.

2.0 Site Certification

- A. To the extent authorized by state law and subject to the conditions set forth herein, the State authorizes the certificate holder to construct, operate and retire a wind and solar power generation facility, together with certain related or supporting facilities, at the site in Sherman County, Oregon, as described in Section 4.0 of this site certificate. ORS 469.401(1)
- B. This site certificate is effective until it is terminated under OAR 345-027-0110 or the rules in effect on the date that termination is sought or until the site certificate is revoked under ORS 469.440 and OAR 345-029-0100 or the statutes and rules in effect on the date that revocation is ordered. ORS 469.401(1)

- C. This site certificate does not address, and is not binding with respect to, matters that were not addressed in the Council's Final Orders on the Application, Amendment #1, Amendment #2, Amendment #3, ~~or~~ Amendment #4, or Amendment #5. These matters include, but are not limited to: building code compliance, wage, hour and other labor regulations, local government fees and charges, and other design or operational issues that do not relate to siting the facility (ORS 469.401(4)) and permits issued under statutes and rules for which the decision on compliance has been delegated by the federal government to a state agency other than the Council. ORS 469.503(3). [Amendments #1, #2, #3, #4, #5]
- D. Both the State and the certificate holder shall abide by local ordinances, state law, and the rules of the Council in effect on the date this site certificate is issued. In addition, upon a clear showing of a significant threat to public health, safety or the environment that requires application of later-adopted laws or rules, the Council may require compliance with such later-adopted laws or rules. ORS 469.401(2)
- E. For a permit, license or other approval addressed in and governed by this site certificate, the certificate holder shall comply with applicable state and federal laws adopted in the future to the extent that such compliance is required under the respective state agency statutes and rules. ORS 469.401(2)
- F. Subject to the conditions herein, this site certificate binds the State and all counties, cities and political subdivisions in Oregon as to the approval of the site and the construction, operation and retirement of the facility as to matters that are addressed in and governed by this site certificate. ORS 469.401(3)
- G. Each affected state agency, county, city and political subdivision in Oregon with authority to issue a permit, license or other approval addressed in or governed by this site certificate shall, upon submission of the proper application and payment of the proper fees, but without hearings or other proceedings, issue such permit, license or other approval subject only to conditions set forth in this site certificate. ORS 469.401(3)
- H. After issuance of this site certificate, each state agency or local government agency that issues a permit, license or other approval for the facility shall continue to exercise enforcement authority over such permit, license or other approval. ORS 469.401(3)
- I. After issuance of this site certificate, the Council shall have continuing authority over the site and may inspect, or direct the Department to inspect, or request another state agency or local government to inspect, the site at any time in order to ensure that the facility is being operated consistently with the terms and conditions of this site certificate. ORS 469.430

3.0 Descriptions

3.1 The Wind Facility

Major Structures

The Biglow Canyon Wind Farm consists of 217 wind turbines (76 Vestas V82 1.65 MW and 141 Siemens 2.3 MWs) with an aggregate nominal nameplate generating capacity of up to 450 megawatts (MW) of electricity and an average electric generating capacity of up to 150 MW. The Vestas V82 turbines are mounted on tubular steel towers with a height of 262 feet at the hub and an overall height of 397 feet including the turbine blades. The Siemens 2.3 MW turbines are mounted on tubular steel towers with a height of 262 feet at the hub and an overall height of 413 feet including the turbine blades. The wind turbines are located on private land that the certificate holder has leased from the affected landowners. [Final Order on ASC, AMD1, AMD2, AMD4]

Related or Supporting Facilities

The facility includes the following related or supporting facilities:

Power Collection System

Each wind turbine generates power at about 600 volts. The transformer sitting at the base of each wind turbine unit increases the voltage to 34.5 kilovolts (kV). From the transformer, power is transmitted to a central substation by means of electric cables. Most of the cables are buried three feet or more below the surface in trenches about 3 feet wide. In areas where collector cables from several turbine strings follow the same alignment, e.g., on approach to the substation, multiple sets of cables have been installed within a single trench. The facility contains approximately 75 miles of 3-wire collector cables are underground. Generally, these cables are above, below or adjacent to the fiber optic cables comprising the supervisory control and data acquisition system.

Approximately 5 miles of 34.5 kV collector cables are above ground on pole or tower structures. Poles or towers supporting aboveground segments of the power collection system are about 23 to 28 feet tall. [Final Order on ASC, AMD1, AMD2, AMD4]

Substations and Interconnection System

The substation site is a graveled, fenced area of up to 6 acres with transformers, switching equipment and a parking area. Transformers are non-polychlorinated biphenyl (PCB) oil-filled types. The facility interconnects with a new Bonneville Power Administration (BPA) system transmission line adjacent to the facility substation. [Final Order on ASC, AMD2, AMD4].

Meteorological Towers

There are 4 meteorological towers throughout the facility site to collect wind resource data. The towers are 279 feet tall. [Final Order on ASC, AMD4]

Operations and Maintenance Buildings

The site of the operations and maintenance buildings is 5 acres adjacent to the substation on Herin Lane. The O&M buildings occupy about 19,500 square feet and include office and workshop areas, control room, kitchen, bathroom, shower, utility sink, and other typical facilities. Water for the bathroom, shower and kitchen is obtained from an onsite well constructed by a licensed contractor in accordance with local and state requirements. Water use from all onsite wells may not cumulatively exceed 5,000 gallons per day, unless a permit is obtained from OWRD. Domestic wastewater generated at the O&M facility drains into an onsite septic system. A graveled parking area for employees, visitors and equipment is located adjacent to the O&M facility. [Final Order on ASC, AMD2, AMD3, AMD4]

Control System

The facility includes a supervisory control and data acquisition (SCADA) system to assist with the remote operation of the wind turbines, to collect data from each wind turbine, and to archive wind and performance data from various sources. The SCADA system is linked by means of fiber optic cables or other means of communication to a central computer in the O&M facility. [Final Order on ASC]

Access Roads

The facility includes about 41.7 miles of roads to provide access to the wind turbine strings, together with turnaround areas at the end of each wind turbine string. The roads are about 16 feet wide (possibly up to 28 feet wide in some locations) and are composed of crushed gravel with shoulders (without gravel) about 3 feet wide. [Final Order on ASC, AMD2, AMD3, AMD4]

3.2 The Solar Facility

The Solar Facility includes up to ~~125~~ 325 MW solar photovoltaic power generation components; up to two battery energy storage systems (BESS) with up to ~~500~~ 1,500 megawatt-hours (MWh) of discharge capacity; and other related or supporting facilities.

The approximate dimensions and specifications for the Solar Facility approved to be constructed and operated are presented in Table 1 below. The final design of the Solar Facility must substantially comply with these dimensions and specifications.

Table 1: Solar Facility Component Summary

Component and Design Standard	No.	Unit
Site Boundary		
Solar Micrositing Area/ Solar Siting Area ¹	1,9243,385	acres
Max. Permanent footprint ¹	1,4452,689	acres
Min. setback from turbines	520	feet
Maximum nominal generating capacity	125325	MW
Modules (590w module with monocrystalline solar cells, antireflective coating, metal frame, and factory installed wire connectors)		
Approx. number of modules	264,836655,988	modules
Approx. module dimensions (W x L)	45x90	inches
Tracking System		
Mounting height	5	feet AGL
Avg. Height at full tilt	7.5 to 10	feet AGL
Max. Height at full tilt	15	feet AGL
Steel Posts (hollow, screw, or pile-type)		
Approx. Total Number	38,019235,139	posts
Avg. Installation Depth	7 to 15	Feet BGL
Power Conversion Stations (Inverter with integrated Step-Up Transformer)		
Approx. Total Number	3488	each
Noise Level	101	dBA (Broadband)
Transformer Oil-Containing Capacity (each)	700	gallons
Battery Energy Storage System (Lithium-ion)		
BESS Yard Site Size	513.7	acres
Battery Containers (of Battery Containers on foundations with integrated inverters, HVAC and fire suppression systems, SCADA BMS)		
Max. Number Enclosures / Inverters	126431	Units
Approx. Dimensions (HxWxL)	10-28.1 x 5-59.1 x 296.3	Feet
BESS Unit and Inverter Battery Container Noise Level (Maximum audible sound pressure level at 10 m)	8467	dBA (Broadband)
BESS Transformers	32110	each
Transformer Oil-Containing Capacity	700	Gallons/each
Related or Supporting Facility Components		
34.5 kV Collection System		
Collector line length, underground	52155	miles
Temporary Impact Corridor (limit)	50	feet
Collector Substation		
Includes GSU transformers, switches, breakers, surge arrestors, metering equipment, grounding, and associated control wiring. Certain equipment is enclosed in a control building.		

Table 1: Solar Facility Component Summary

Component and Design Standard	No.	Unit
Site size	4.2 13.7	acres
Generator Step-Up Transformers	24	each
Transformer Oil-Containing Capacity	10,000-15,000	gallons
Transformer Noise Level (Sound Power)	106	dBA
Control building dimensions	40x15	Feet
Height of structures	8 to 25	feet
230 kV Transmission Line		
Length	1900 16,156	feet
Corridor Width (contains all disturbance)	150	Feet
Corridor Area	249.44	acres
Steel Monopole Support Structures	425	each
Height of Support Poles (max.)	80 140	feet
O&M Facility		
Steel building/prefabricated office structure with adjacent storage enclosures and parking areas, well, septic system.		
Building Dimensions	60 X 12	foot
Site size	36	Acres
400 ft ² Storage Containers	36	Each
Internal Access Roads		
Length (graveled)	10.5 28.1	miles
Width	16-20	feet
Vegetation Management Buffer (each side)	10	feet
Perimeter Fence		
Total Length	75,900 120,780	Feet
Height	8	Feet
Access gates	57	each
Clear, brush free Area (10- feet from both exterior and interior)	20	Feet
Temporary Construction Areas		
Site Size	8.7 20.7	Acres
1,000-gal aboveground fuel storage tanks	3 5	Each
<p>Acronyms: dBA = A-weighted decibels; HVAC = heating, ventilation and air conditioning; kV = kilovolt; OH = overhead; O&M = operations and maintenance; SCADA = supervisory, control and data acquisition</p> <p>Sources: RFA4, Table 1.</p> <p>Notes:</p> <ol style="list-style-type: none"> 1. Solar facility components would permanently occupy up to 1,4452,689 acres within the 1,9243,385-acre Solar Micrositing Area/Solar Siting Area (together, Solar Facility Area). Area within the perimeter fenceline of the solar facility is considered a permanent impact under the Fish and Wildlife Habitat standard; however, impacts within the perimeter fenceline to soils, vegetation and noxious weeds are not considered permanent under the Soil Protection and Land Use standards and must be minimized and mitigated, as discussed in applicable sections in this order. 		

[AMD4; AMD5]

Solar Photovoltaic Power Generation Facilities

The solar components have a nameplate generating capacity of up to ~~125-325~~ MW. The addition of the solar and battery components increases the peak generating capacity of the facility, as a whole, to ~~575-775~~ MW.

Solar photovoltaic power generation facilities typically consist of rows of photovoltaic modules mounted on a racking system that is either fixed in place or able to track the sun on one or more axes. The racking system is typically supported by steel posts that are either driven directly into the ground or installed into pre-drilled holes. The low voltage DC output of the photovoltaic modules is collected with a cabling system and transmitted to inverter and transformer units which convert the output of several rows of modules to 35-kV AC power that can be collected via the facility's electrical collector system. The ground below and surrounding the solar arrays would mostly be vegetated, with gravel where needed for maintenance and access roads or where gravel already exists. [Final Order on ~~AMD4AMD5~~]

Modules

Modules typically consist of mono or poly-crystalline solar cells, antireflective coating, non-specular, galvanized steel racks, and factory installed wire connectors. The modules will be connected in series to form strings which are then collected via combiners, cables, and switchboards. The type and number of modules required will be determined at final facility design based on the technology available at that time. The certificate holder assumes use of N-type monocrystalline solar cells. [Final Order on ~~AMD4AMD5~~]

Tracking System

Strings of modules will be mounted on single-axis tracker systems to optimize electricity production by rotating the solar modules to follow the path of the sun throughout the day. Each set of modules is expected to be mounted approximately 5 feet off the ground on a single-axis tracker that rotates 60 degrees to the east and west. At maximum tilt, the top edge of the modules is expected to be 7.5 to 10 feet above ground level with a maximum of 15 feet where topography curves under a row. The tracker system and associated posts will be designed to withstand wind, snow, and seismic loads anticipated at the site. [Final Order on ~~AMD4AMD5~~]

Posts and Foundations

Each tracker row will be supported by multiple steel posts. Hollow steel sections, screw piles, or pile-type posts may be used. Posts will typically be installed 7 to 15 feet below the ground surface and extend approximately 5 feet above grade. Exterior posts at the end of tracker rows are typically installed to greater depth to withstand inclement weather including high wind conditions. In some soil conditions, concrete grouting may be used as backfill, as required. The total number of posts and foundation installation methods required will be determined during

detailed design of the tracker system and future geotechnical investigations. [Final Order on ~~AMD4~~AMD5]

Cabling

Cables will be used to collect and aggregate the DC output of multiple tracker rows for transmission to the inverter/inverter step-up transformer units described below. Cabling may be installed underground along tracker rows and aggregated using combiner boxes or installed aboveground in aluminum trays or using harnessing if a trunk bus system is used for aggregation. Either system requires a similar amount of cabling. [Final Order on ~~AMD4~~AMD5]

Power Conversion Stations (PCS)

Integrated inverter and step-up transformer systems called Power Conversion Stations (PCS), or similar systems, will be installed throughout the solar arrays to convert the low-voltage DC output of the modules to 34.5 kV AC power that can be transmitted via the electrical collector system. Each transformer will contain approximately 700 gallons of mineral oil. Each PCS will be installed on a concrete pad or pile-supported foundation. The inverter specifications will comply with the applicable requirements and standards of the National Electric Code and Institute of Electrical and Electronics Engineers standards. [Final Order on ~~AMD4~~AMD5]

Battery Energy Storage Systems

The BESS facilities will be AC-coupled and located adjacent to the collector substations on a fenced 5-acre site in the north and a fenced 8.7-acre site in the south.

The BESS will consist of modular enclosures that hold lithium-ion batteries, battery management systems, integrated inverters, and fire prevention systems. Cooling units will be placed either on top of or along the side of the enclosures may include separate chiller plants. Each enclosure will be placed on a concrete pad or pile-supported foundation. The enclosures will be manufactured, assembled, and inspected off-site prior to installation. Each enclosure will be installed on a concrete pad or pile foundation.

The BESS will use lithium-ion (Li-ion) batteries. Li-ion batteries are a type of rechargeable battery where lithium ions, suspended in a gel or liquid electrolyte, move from negative to positive electrodes and back when recharging. A Li-ion battery typically consists of a modular unit containing multiple cells, which are hermetically sealed pouches that serve as primary containment for the electrolyte solution. Modules are placed in anchored racks and wired into strings, with each enclosure containing multiple battery strings. Each enclosure may contain up to 10,000 cells.

Lithium-ion batteries and electrolyte are typically considered to be hazardous materials due to their flammability and potential for chemical reaction. Electrolyte can only escape (as vapor) in

the unlikely case that a battery module fails, and while the enclosure itself provides additional containment in the event of a module failure, venting may be required in the event of a fire or other emergency. Due to the risks, the U.S. Department of Transportation and U.S. Environmental Protection Agency also require special handling when transporting or disposing of lithium-ion batteries.

Initially, the BESS will include up to ~~153~~ 384 modular enclosures; however, because battery performance degrades over time additional batteries and associated equipment will be periodically augmented as needed to maintain the design capacity of the system. Approximately ~~183~~ 460 enclosures will be installed at the site over the life of the facility. [Final Order on ~~AMD4~~AMD5]

BESS Transformers

The BESS includes up to ~~39~~ 97 transformers to increase the output voltage from the inverters integrated into the BESS enclosures (typically 660 volts) to the substation feed voltage (34.5-kilovolt [kV] AC). The transformers are anticipated to be approximately 8 to 10 feet in height and will be installed on a concrete pad or pile-supported foundation. Each transformer will contain approximately 700 gallons of mineral oil for cooling. Oils needed for maintenance will be delivered by a licensed maintenance contractor on an as-needed basis, and no substantial quantities will be stored on-site. [Final Order on ~~AMD4~~AMD5]

BESS Yard

The BESS facilities ~~will be~~ located in a 5-acre fenced, graveled yard, adjacent to the collector substation ~~discussed below and in an 8.7-acre fenced, graveled yard adjacent to the collector substation, as discussed below.~~ [Final Order on ~~AMD4~~AMD5]

Other Related or Supporting Facilities

34.5 kV Electrical Collection System

The output of the ISU and BESS transformers will be aggregated and transmitted to the collector substations via underground 34.5-kV collector lines. Up to ~~52~~ 155 miles of collector line will be installed within the solar array fence lines. The collector lines will be buried to a minimum of 3 feet at lateral depth, with junction splice boxes positioned intermittently along the lines for maintenance access. [Final Order on ~~AMD4~~AMD5]

Collector Substation

The Fox Canyon collector-substation ~~will be constructed to~~ will aggregate and convert the 34.5 kV power transmitted through the electrical collection system to 230-kV power that can be transmitted to the grid from the existing Biglow Canyon Substation. A new collector substation

will be constructed to aggregate and convert the 34.5 kV power transmitted from the new collector substation to the Fox Canyon substation via a 2.7-mile gen-tie line, then transmitted to the grid via the existing Biglow Canyon Substation.

The substations will each include a generator step-up (GSU) transformer and other electrical equipment including, but not limited to switches, breakers, surge arrests, metering equipment, grounding, and associated control wiring. Certain equipment, including breakers and transformer equipment, will be enclosed in a control buildings. The GSU transformers are expected to be a ground-mounted units constructed on a concrete pads. The transformers will each contain between 10,000 and 15,000 gallons of mineral or seed oil for cooling and insulation.¹ To minimize the potential for spills, the GSU transformers will be equipped with a secondary containment trap sized to contain the amount of oil inside the transformer plus an additional volume for deluge water and required freeboard. [Final Order on AMD4AMD5]

230-kV Overhead Transmission Line

The solar facility will include an approximately 1,900-foot long 230 kV overhead transmission line connecting the Fox Canyon Collector Substation to the existing Biglow Canyon Substation and a 2.7-mile 230 kV overhead transmission line connecting the new collector substation to the Fox Canyon Substation. The 1,900-foot transmission line will be is supported by three-four 80-foot steel monopole support structures, and the 2.7-mile transmission line will be supported by 21 poles. [Final Order on AMD4AMD5]

O&M Building

A Two new O&M facilities will be constructed in the Solar Facility area. The O&M facility facilities will each include a steel building or prefabricated office structure with facilities for staff use; enclosures for storing spare parts and maintenance equipment; and space for parking service staging zone and clearance areas. The O&M facilities will each have a septic system, and a septic system permits will be obtained from the Sherman County Public Health Department. Small quantities of lubricants, degreasers, herbicides, or other chemicals may be stored at the O&M facilities. In addition, up to approximately 4,0806,851 spare modules may be stored at the O&M facilities for replacement over the life of the solar components. [Final Order on AMD4AMD5]

Communications and SCADA System

The SCADA for the solar facilities will be integrated with the SCADA for the wind facility, allowing facility operating parameters, power output, and other variables such as meteorological conditions to be constantly monitored from the facility control rooms and remote locations. [Final Order on AMD4AMD5]

¹ Consistent with federal regulations, the oils used in transformers do not contain polychlorinated biphenyls or compounds listed as extremely hazardous by the U.S. Environmental Protection Agency.

Internal Access Roads

Approximately ~~10.5~~^{28.1} miles of new access roads will be constructed within the solar array areas to provide access to the facility components. In accordance with Oregon Fire Code Section 503, roads ~~within the Solar Facility~~ needed for emergency access will be approximately 20 feet wide and designed to meet load requirements for all equipment and emergency access needs. ~~0~~, and other roads would be approximately 16 feet wide. All roads would have a 10-foot buffer maintained with low-growing, fire resistant vegetation on either side. [Final Order on ~~AMD4~~^{AMD5}]

Perimeter Fencing, and Gates

Each solar array, with any collocated related or supporting facility components, will be enclosed by seven-foot-tall chain-link perimeter fencing with one foot of razor or barbed wire at the top. Alternatively, wire mesh or similar perimeter fencing up to 8 feet in height may be used. Fences will be constructed and grounded in accordance with NESC Rule 110. Vehicle access to the facility will be provided by lockable vehicle gates. Additional gates may be installed for emergency exit or removal of wildlife. [Final Order on ~~AMD4~~^{AMD5}]

Temporary Construction Areas

Up to ~~8.7~~^{20.7} acres will be used as a temporary construction area to store supplies and equipment and facilitate the delivery and assembly of materials and equipment during construction. Additional temporary construction areas may be ~~utilized~~^{used} within the ~~Solar Facility Solar Micrositing Area~~. The areas ~~will~~ consist of a crushed gravel surface that will be removed following construction, crushed gravel surface that will remain following construction because that was the pre-existing surface condition, or vegetation that is left in place for which the need to revegetate will be evaluated following construction. Nonreportable quantities of herbicides, insecticides, paint, cleaners, solvents, or other chemicals may be used and stored in the temporary construction areas. Up to ~~three~~^{five} aboveground 1,000-gallon fuel tanks may be installed in an area within the temporary construction area that provides secondary containment. Concrete for construction of foundations will come directly from licensed suppliers and there would not be an on-site batch plant installed at the temporary construction areas. [Final Order on ~~AMD4~~^{AMD5}]

Solar ~~Facility~~ Micrositing Area

The solar facility components are approved to be located within a ~~1,924-acre Solar Micrositing Area~~, ^{3,385-acre Solar Facility Area}, as presented in Figure 1.

The existing Biglow Canyon Substation, which will be the point of interconnection for the solar facility components to the regional transmission grid, is located within the Solar ~~Micrositing~~ Facility Area. [Final Order on ~~AMD4~~AMD5]

3.3 Location of The Facility

The facility is located about 2.5 miles northeast of the City of Wasco in Townships 1 and 2 North, Ranges 17 and 18 East, Willamette Meridian, Sherman County, Oregon. The Solar ~~Micrositing~~ Facility Area is located approximately ~~4.8~~2.5 miles northeast of the Town of Wasco. [Final Order on ASC, ~~AMD4~~AMD5]

The conditions of this Site Certificate are organized and coded to indicate the phase of implementation, the standard the condition is required to satisfy, and an identification number (1, 2, 3, etc.).² The table below presents a “key” for phase of implementation:

Key	Type of Conditions/Phase of Implementation
GEN	General Conditions: Design, Construction and Operation
PRE	Pre-Construction Conditions
CON	Construction Conditions
PRO	Pre-Operational Conditions
OPR	Operational Conditions
RET	Retirement Conditions

The facility is approved to be constructed in phases. Therefore, preconstruction and construction conditions include language allowing for the condition to be satisfied based on the applicability of the requirements to the location or component to be constructed, rather than the entirety of the facility, components or site not yet constructed or impacted.

4.0 Conditions Applicable to the Entire Facility

The conditions listed in this section are based on representations in the site certificate application and supporting record. The Council deems these representations to be binding commitments made by the certificate holder. These conditions are required under OAR 345-025-0006(10).

² The identification number is not representative of an order that conditions must be implemented; it is intended only to represent a numerical value for identifying the condition.

This section includes other specific facility conditions the Council finds necessary to ensure compliance with the siting standards of OAR Chapter 345, Divisions 22 and 24, and to protect the public health and safety.

4.1 General (GEN) Conditions: Design, Construction and Operations

Condition Number	General (GEN) Conditions
STANDARD: GENERAL STANDARD OF REVIEW (GS) [OAR 345-022-0000]	
GEN-GS-01	The Council shall not change the conditions of the site certificate except as provided for in OAR Chapter 345, Division 27. [OAR 345-027-0020(1); Final Order on ASC, Condition 101; AMD4]
GEN-GS-02	Notwithstanding OAR 345-027-0353(1), an amendment of the site certificate is required if the proposed change would increase the electrical generation capacity of the facility or would increase the number of wind turbines or the dimensions of existing wind turbines. [Final Order on ASC, Condition 14; AMD4]
GEN-GS-03	The certificate holder shall design, construct, operate and retire the facility: <ul style="list-style-type: none"> a. Substantially as described in the site certificate; b. In compliance with the requirements of ORS Chapter 469, applicable Council rules, and applicable state and local laws, rules and ordinances in effect at the time the site certificate is issued; and c. In compliance with all applicable permit requirements of other state agencies. [OAR 345-027-0020(3); Final Order on ASC, Conditions 13, 103; AMD4]
GEN-GS-04	If the certificate holder becomes aware of a significant environmental change or impact attributable to the facility, the certificate holder shall, as soon as possible, submit a written report to the Department describing the impact on the facility and any affected site certificate conditions. [OAR 345-027-0028; Final Order on ASC, Condition 120; AMD3; AMD4]
GEN-GS-05	The certificate holder shall prevent the development of any conditions on the site that would preclude restoration of the site to a useful, non-hazardous condition to the extent that prevention of such site conditions is within the control of the certificate holder. [OAR 345-027-0020(7); Final Order on ASC, Condition 107; AMD4]
STANDARD: Organizational Expertise (OE) [OAR 345-022-0010]	
GEN-OE-01	Before any transfer of ownership of the facility or ownership of the site certificate holder, the certificate holder shall inform the Department of the proposed new owners. The requirements of OAR 345-027-0400 apply to any transfer of ownership that requires a transfer of the site certificate. [OAR 345-027-0020(15); Final Order on ASC; Condition 115; AMD3; AMD4]
GEN-OE-02	The certificate holder shall contractually require all contractors and subcontractors involved in the construction or operation of the facility to comply with all applicable laws and regulations and with the terms and conditions of the site certificate. Such

Condition Number	General (GEN) Conditions
	<p>contractual provisions shall not operate to relieve the certificate holder of responsibility under the site certificate. Any notice of violation, civil penalties, or other enforcement action issued under the site certificate will be issued to the certificate holder.</p> <p>[Final Order on ASC, Condition 2; AMD4]</p>
GEN-OE-03	<p>The certificate holder shall obtain all necessary state and local permits or approvals required for construction, operation and retirement of the facility or ensure that its contractors obtain necessary state and local permits or approvals.</p> <p>[Final Order on ASC, Condition 15; AMD4]</p>
GEN-OE-04	<p>The certificate holder shall, as soon as reasonably possible:</p> <ol style="list-style-type: none"> a. Report incidents or circumstances that may violate the terms or conditions of the site certificate, terms or conditions of any order of the Council, to the Department within 72 hours. In the report to the Department, the certificate holder shall provide all pertinent facts including an estimate of how long the conditions or circumstances existed, how long they are expected to continue before they can be corrected, and whether the conditions or circumstances were discovered as a result of a regularly scheduled compliance audit; b. Initiate and complete appropriate action to correct the conditions or circumstances and to minimize the possibility of recurrence; c. Submit a written report within 30 days of discovery to the Department. The report must contain: <ol style="list-style-type: none"> i. A discussion of the cause of the reported conditions or circumstances; ii. The date of discovery of the conditions or circumstances by the responsible party; iii. A description of immediate actions taken to correct the reported conditions or circumstances; iv. A description of actions taken or planned to minimize the possibility of recurrence; and v. For conditions or circumstances that may violate the terms or conditions of a site certificate, an assessment of the impact on the resources considered under the standards of OAR Chapter 345 Divisions 22 and 24 as a result of the reported conditions or circumstances. d. Upon receipt of a written report submitted under this condition, the Department may review the facility record for incidents or circumstances related to public health and safety, the environment, or other resources protected under Council standards. If these incidences are determined by the Department to impact the adequacy of the facility decommissioning cost, the Department or Council may adjust the contingencies identified in Final Order on RFA4, Attachment I and shall request and receive an updated bond or letter of credit from certificate holder in the adjusted amount. <p>[Final Order on ASC, Condition 4; AMD4; AMD5]</p>

Condition Number	General (GEN) Conditions
GEN-OE-05	<p>The certificate holder shall notify the Department of Energy within 72 hours of any occurrence involving the facility if:</p> <ol style="list-style-type: none"> There is an attempt by anyone to interfere with its safe operation; A natural event such as an earthquake, flood, tsunami or tornado, or a human-caused event such as a fire or explosion affects or threatens to affect the public health and safety or the environment; or There is any fatal injury at the facility. <p>[OAR 345-026-0170; Final Order on ASC, Condition 125; AMD3, AMD4]</p>
GEN-OE-06	<p>The certificate holder and the Department of Energy shall exchange copies of all correspondence or summaries of correspondence related to compliance with statutes, rules and local ordinances on which the Council determined compliance, except for material withheld from public disclosure under state or federal law or under Council rules. The certificate holder may submit abstracts of reports in place of full reports; however, the certificate holder shall provide full copies of abstracted reports and any summarized correspondence at the request of the Department.</p> <p>[OAR 345-026-0105; Final Order on ASC, Condition 124, AMD3, AMD4]</p>
GEN-OE-07	<p>During construction, operation or retirement of the facility, the certificate holder shall notify the Department within 72 hours of any accidents that may result in public health and safety concerns, including mechanical failures on the site associated with construction or operation of the facility.</p> <p>[Final Order on ASC, Condition 37; AMD4]</p>
STANDARD: Soil Protection (SP) [OAR 345-022-0022]	
GEN-SP-01	<p>The certificate holder shall use hazardous materials in a manner that protects public health, safety and the environment and shall comply with applicable local, state and federal environmental laws and regulations.</p> <p>[Final Order on ASC, Condition 80; AMD4]</p>
STANDARD: Land Use (LU) [OAR 345-022-0030]	
GEN-LU-01	<p>The certificate holder shall ensure that no equipment or machinery is parked or stored on any county road except while in use.</p> <p>[Final Order on ASC, Condition 18; AMD4]</p>
STANDARD: Retirement and Financial Assurance (RF) [OAR 345-022-0050]	
GEN-RF-01	<ol style="list-style-type: none"> Prior to construction of the facility, or any component of the facility, the certificate holder shall submit to the State of Oregon, through the Council, a bond or letter of credit in a form and amount satisfactory to the Council to restore the site to a useful, non-hazardous condition. The certificate holder shall maintain a bond or letter of credit in effect at all times until the facility has been retired. The Council may specify different amounts for the bond or letter of credit during construction and during operation of the facility. The certificate holder shall annually adjust all bonds or letters of credit submitted in compliance with this condition to present value using the U.S. Gross Domestic Product Implicit Price Deflator, Chain-Weight, as published in the

Condition Number	General (GEN) Conditions
	<p>Oregon Department of Administrative Services’ Oregon Economic and Revenue Forecast or by any successor agency (the “Index”). If at any time the Index is no longer published, the Department shall select a comparable calculation to adjust the amount to present value.</p> <p>[Final Order on ASC, Condition 108; AMD3; AMD4]</p>
GEN-RF-02	<p>For the wind energy facility, the bond or letter of credit required under Condition GEN-RF-01 shall be in an amount approved by the Department and based on the costs shown in Table 1 of the Final Order on Amendment #3. The certificate holder shall adjust the amounts of all bonds or letters of credit submitted in compliance with this condition to present value as of the date of issuance, using the following calculation and subject to approval by the Department:</p> <ol style="list-style-type: none"> Adjust the Subtotal (in 2005 dollars) to present value, using the U.S. Gross Domestic Product Implicit Price Deflator, Chain-Weight, as published in the Oregon Department of Administrative Services’ Oregon Economic and Revenue Forecast or by any successor agency (the “Index”). If at any time the Index is no longer published, the Council shall select a comparable calculation to adjust 2005 dollars to present value. Add 1 percent of the adjusted Subtotal (i) for the adjusted performance bond amount to determine the adjusted Gross Cost. Add 10 percent of the adjusted Gross Cost (ii) for the adjusted administration and project management costs and 10 percent of the adjusted Gross Cost for the adjusted future developments contingency. Add the adjusted Gross Cost (ii) to the sum of the percentages (iii) and round the resulting total to the nearest \$1,000 to determine the adjusted financial assurance amount. <p>[Final Order on ASC, Condition 9, AMD2, AMD3, AMD4]</p>
GEN-RF-03	<p>For the solar facility, the bond or letter of credit required under Condition GEN-RF-01 shall be in an amount approved by the Department and based on the unit costs, markups, and contingencies shown in Attachment J of the Final Order on RFA4, as updated under Condition PRE-RF-01.</p> <p>[Final Order on AMD4, Retirement and Financial Assurance Condition 1]</p>
GEN-RF-04	<p>If the certificate holder elects to use a bond to meet the requirements of Condition GEN-RF-01, the certificate holder shall ensure that the surety is obligated to comply with the requirements of applicable statutes, Council rules and this site certificate when the surety exercises any legal or contractual right it may have to assume construction, operation or retirement of the facility. The certificate holder shall also ensure that the surety is obligated to notify the Council that it is exercising such rights and to obtain any Council approvals required by applicable statutes, Council rules and this site certificate before the surety commences any activity to complete construction, operate or retire the facility.</p> <p>[Final Order on ASC, Condition 10, AMD4]</p>

Condition Number	General (GEN) Conditions
STANDARD: Fish and Wildlife Habitat (FW) [OAR 345-022-0060]	
GEN-FW-01	The certificate holder shall design and construct all aboveground transmission line support structures following the current practices suggested by the Avian Powerline Interaction Committee at the time of design. [Final Order on ASC, Condition 58; AMD4]
STANDARD: Siting Standards for Transmission Lines (TL) [OAR 345-024-0090]	
GEN-TL-01	The certificate holder shall design all overhead transmission lines so that alternating current electric fields shall not exceed 9 kV per meter at one meter above the ground surface in areas accessible to the public. [Final Order on ASC, Condition 53; AMD4]
GEN-TL-02	The certificate holder shall design all overhead transmission lines so that induced voltages resulting from the transmission lines are as low as reasonably achievable. [Final Order on ASC, Condition 54; AMD4]
STANDARD: Other – Removal-Fill (WL)	
GEN-WL-01	The certificate holder shall avoid any disturbance, including the placement of poles for the collector line, within 25 feet of the stream channel in the area identified as Crossing G in the Request for Amendment #2 and within a wetland area identified as “POWHX” on Figure J-1 of the site certificate application. [Final Order on AMD2, Condition 127; AMD4]
GEN-WL-02	The certificate holder shall avoid any disturbance within 25 feet of the stream channel in the area identified as “Stream Crossing H” in the Request for Amendment #3 and shall install any collector line through the area by tunneling or drilling beneath the stream channel. [Final Order on AMD3, Condition 129; AMD4]

4.2 Operational (OPR) Conditions

Condition Number	Operational (OPR) Conditions
STANDARD: Organizational Expertise (OE) [OAR 345-022-0010]	
OPR-OE-01	<ul style="list-style-type: none"> a. By April 30 of each year after beginning construction, the certificate holder shall submit an annual report to the Department. The Council Secretary and the certificate holder may, by mutual agreement, change the reporting date. b. In the annual report, the certificate holder shall include the following information for the calendar year preceding the date of the report: <ul style="list-style-type: none"> i. Facility Status: An overview of site conditions, the status of facilities under construction, and a summary of the operating experience of facilities that are in operation. In this section of the annual report, the certificate holder shall describe any unusual events, such as earthquakes, extraordinary windstorms, major accidents or the like that occurred during the year and that had a significant adverse impact on the facility. ii. Reliability and Efficiency of Power Production: For electric power plants, the plant availability and capacity factors for the reporting year. The certificate holder shall describe any equipment failures or plant breakdowns that had a significant impact on those factors and shall describe any actions taken to prevent recurrence of such problems; iii. Status of Surety Information: Documentation demonstrating that bonds or letters of credit as described in the site certificate are in full force and effect and will remain in full force and effect for the term of the next reporting period; iv. Monitoring Report: A list and description of all significant monitoring and mitigation activities performed during the previous year in accordance with site certificate terms and conditions, a summary of the results of those activities, and a discussion of any significant changes to any monitoring or mitigation program, including the reason for any such changes. v. Compliance Report: A description of all instances of noncompliance with a site certificate condition. For ease of review, the certificate holder shall, in this section of the report, use numbered subparagraphs corresponding to the applicable sections of the site certificate. vi. Facility Modification Report: A summary of changes to the facility that the certificate holder has determined do not require a site certificate amendment in accordance with OAR 345-027-0350. c. To the extent that information required by this condition is contained in reports the certificate holder submits to other state, federal or local agencies, the certificate holder may submit excerpts from such other reports to satisfy this condition. The Council reserves the right to request full copies of such excerpted reports.

Condition Number	Operational (OPR) Conditions
	[OAR 345-026-0080; Final Order on ASC, Condition 122; AMD3; AMD4]
STANDARD: Soil Protection (SP) [OAR 345-022-0020]	
OPR-SP-01	<p>During operation of the facility, the certificate holder may engage in wind turbine blade and solar panel washing activities but shall ensure that these activities do not cause runoff of washwater from the site or discharges to surface waters, storm sewers or dry wells. The certificate holder shall not use acids, bases or metal brighteners with the wash water. The certificate may use biodegradable, phosphate-free cleaners sparingly.</p> <p>[Final Order on ASC, Condition 88; AMD2; AMD4]</p>
OPR-SP-02	<ol style="list-style-type: none"> If a spill or release of a reportable quantity of fuel, oil, or other hazardous materials occurs during construction or operation of the facility, the certificate holder shall notify the Department within 72 hours of discovery. The certificate holder shall clean up any spill or release of hazardous materials and dispose of any contaminated soil or other materials according to applicable regulations. The certificate holder shall ensure that spill kits containing items such as absorbent pads are located on equipment and storage facilities to respond to accidental spills and shall instruct employees handling hazardous materials in the proper handling, storage and cleanup of these materials. <p>[Final Order on ASC, Condition 81; AMD4]</p>
STANDARD: Land Use (LU) [OAR 345-022-0030]	
OPR-LU-01	<p>During operation of the facility, the certificate holder, in cooperation with landowners, shall avoid impact on cultivated land to the extent reasonably possible when performing facility repair and maintenance activities.</p> <p>[Final Order on ASC, Condition 22; AMD4]</p>
STANDARD: Retirement and Financial Assurance (RF) [OAR 345-022-0050]	
OPR-RF-01	<p>During operation of the facility, the certificate holder shall:</p> <ol style="list-style-type: none"> Annually adjust the amount of bonds or letters of credit provided to satisfy Condition GEN-RF-01 to present dollar value, as determined by the Department. The Department shall adjust to present value using the U.S. Gross Domestic Product Implicit Price Deflator, Chain-Weight, as published in the Oregon Department of Administrative Services' Oregon Economic and Revenue Forecast or by any successor agency (the "Index"). If at any time the Index is no longer published, the Department shall select a comparable calculation to adjust the amount to present value. Incorporate any additional decommissioning costs for proposed facility changes which have been determined by the Department not to require a site certificate amendment. The Department and Council reserve the right to adjust the contingencies, as appropriate and necessary to protect public health and safety or the environment

Condition Number	Operational (OPR) Conditions
	and ensure the certificate holder's bond or letter of credit is sufficient to restore the site to a useful, non-hazardous condition. [Final Order on AMD4, Retirement and Financial Assurance Condition 3]
STANDARD: Fish and Wildlife Habitat (FW) [OAR 345-022-0060]	
OPR-FW-01	The certificate holder shall conduct wildlife monitoring and mitigation in accordance with the Wildlife Monitoring and Mitigation Plan that is incorporated in the Final Order on Amendment #2 as Attachment A and as may be amended from time to time. [Final Order on ASC, Condition 61; AMD2; AMD4]
OPR-FW-02	For the life of the project, the certificate holder shall provide to the appropriate staff of the Confederated Tribes of the Warm Springs Reservation of Oregon the same annual mitigation and monitoring reports it submits to the Department. [Final Order on ASC, Condition 64; AMD4]
OPR-FW-03	For the life of the project, the certificate holder shall consult annually with the appropriate staff of the Confederated Tribes of the Warm Springs Reservation of Oregon to discuss noxious weed or other issues that may arise from the close proximity of the facility site and tribal lands. The certificate holder shall provide a summary of that consultation in the annual report it provides to the Department. [Final Order on ASC, Condition 65; AMD4]
STANDARD: Public Services (PS) [OAR 345-022-0110]	
OPR-PS-01	During operation of the facility, for any water needed from offsite sources, the certificate holder and its contractors shall: <ul style="list-style-type: none"> a. Identify all water-related needs and estimate daily and annual water demand for facility operations. b. Provide evidence such as a contract or purchase agreement demonstrating that adequate water supply to meet facility operational demand has been secured and that water for all operational activities will be legally obtained by service providers or third-party permits. [Final Order on ASC, Condition 76; AMD4]
OPR-PS-02	During operation of the facility, the certificate holder shall develop and implement a site health and safety plan that informs on-site employees and others what to do in case of an emergency and that includes the locations of fire extinguishers and nearby hospitals, important telephone numbers, and first aid techniques. [Final Order on ASC, Condition 47]
STANDARD: Waste Minimization (WM) [OAR 345-022-0120]	
OPR-WM-01	During operation of the facility, the certificate holder shall discharge sanitary wastewater generated at the O&M buildings to licensed on-site septic systems in compliance with county permit requirements. The certificate holder shall design the septic systems with a capacity that is less than 2,500 gallons per day. [Final Order on ASC, Condition 83; AMD3; AMD4]
OPR-WM-02	During operation of the facility, the certificate holder shall implement a waste management plan that includes but is not limited to the following :

Condition Number	Operational (OPR) Conditions
	<ul style="list-style-type: none"> a. The format, content and frequency of employee trainings to minimize the generation of solid waste, recycle materials, and properly handle and dispose of electronic wastes and hazardous materials; b. Identify names and locations of licensed haulers and facilities that will be used for the following, including associated collection and hauling protocols and requirements: <ul style="list-style-type: none"> i. Recycling paper products, metals, glass and plastics, and other recyclable materials; ii. Disposing non-recyclable, nonhazardous waste for transport to a landfill; c. Identify a procedure or process for evaluating whether photovoltaic modules, batteries, or other facility components are considered hazardous waste under state or federal regulations; d. Identify procedures for the segregation of recyclable materials, nonhazardous waste, and hazardous waste sources for transport and disposal by a licensed hauler specializing in the proper recycling or disposal of the wastes; e. Identify inspection and recordkeeping procedures for waste handling, disposal and recycling; and f. Include a provision allowing for updates of the plan, subject to the Department review and approval. <p>[Final Order on ASC, Condition 87; AMD4]</p>
STANDARD: Other – Water Rights (WR)	
OPR-WR-01	<ul style="list-style-type: none"> a. For any onsite exempt wells, combined water usage shall not exceed 5,000 gallons per day for domestic use at the facility's O&M buildings and solar panel and blade-washing activities. b. If new exempt wells are constructed for the solar facility, the certificate holder shall install flow meters on the existing and new wells; monitor the volume of groundwater used from all onsite wells on a daily basis, maintain a record of such use and make the monitoring records available to the Department upon request. <p>[Final Order on ASC, Condition 75; AMD3, AMD4]</p>

4.3 Retirement (RET) Conditions

Condition Number	Retirement (RET) Conditions
STANDARD: Retirement and Financial Assurance (RF) [OAR 345-022-0050]	
RET-RF-01	<ul style="list-style-type: none"> a. The certificate holder shall retire the facility if the certificate holder permanently ceases construction or operation of the facility. The certificate holder shall retire the facility according to a final retirement plan approved by the Council, as described in OAR 345-027-0110. The certificate holder shall pay the actual cost to restore the site to a useful, non-hazardous condition at the time of

Condition Number	Retirement (RET) Conditions
STANDARD: Retirement and Financial Assurance (RF) [OAR 345-022-0050]	
RET-RF-02	<p>retirement, notwithstanding the Council’s approval in the site certificate of an estimated amount required to restore the site.</p> <p>b. If the certificate holder permanently ceases construction or operation of a portion of the facility that is, by itself, an energy facility under ORS 469.300, the certificate holder must retire that portion of the facility within two years following cessation of construction or operation of the facility components in accordance with the provisions of OAR 345-027-0110(10). [OAR 345-027-0020(9); Final Order on ASC, Condition 109; AMD4]</p> <p>If the Council finds that the certificate holder has permanently ceased construction or operation of the facility without retiring the facility according to a final retirement plan approved by the Council, as described in OAR 345-027-0110, the Council shall notify the certificate holder and request that the certificate holder submit a proposed final retirement plan to the Office within a reasonable time not to exceed 90 days. If the certificate holder does not submit a proposed final retirement plan by the specified date, the Council may direct the Department to prepare a proposed a final retirement plan for the Council’s approval. Upon the Council’s approval of the final retirement plan, the Council may draw on the bond or letter of credit provided under Condition GEN-RF-01 to restore the site to a useful, non-hazardous condition according to the final retirement plan, in addition to any penalties the Council may impose under OAR Chapter 345, Division 29. If the amount of the bond or letter of credit is insufficient to pay the actual cost of retirement, the certificate holder shall pay any additional cost necessary to restore the site to a useful, non-hazardous condition. After completion of site restoration, the Council shall issue an order to terminate the site certificate if the Council finds that the facility has been retired according to the approved final retirement plan. [OAR 345-027-0020(160); Final Order on ASC, Condition 116; AMD3, AMD4]</p>

5.0 Conditions Applicable to the Wind Energy Facility

5.1 General (GEN) Conditions: Design, Construction and Operations

Condition Number	General (GEN) Conditions
<i>STANDARD: Land Use (LU) [OAR 345-022-0030]</i>	
GEN-LU-02	The certificate holder shall construct the public road improvements described in the site certificate application to meet or exceed road standards for the road classifications in the County's Transportation System Plan and Zoning Ordinance because roads will require a more substantial section to bear the weight of the vehicles and turbine components than would usually be constructed by the County. [Final Order on ASC, Condition 17; AMD4]
GEN-LU-03	The site certificate holder shall design and construct private access roads associated with the wind energy facility to minimize the division of existing farm units. [Final Order on ASC, Condition 19; AMD4]
GEN-LU-04	The certificate holder shall not locate any aboveground facility structure associated with the wind energy facility (including wind turbines, O&M buildings, substations, and meteorological towers, but not including aboveground transmission and collector lines and junction boxes) within 30 feet from any property line or within 50 feet from the right-of-way of any arterial or major collector road or street and shall not allow any architectural feature, as described in Sherman County Zoning Ordinance Section 4.2, to project into these required setbacks by more than 2 feet. [Final Order on ASC, Condition 19; AMD3, AMD4]
GEN-LU-05	The certificate holder shall locate access roads associated with the wind energy facility to minimize disturbance with farming practices and, wherever feasible, shall place turbines and transmission interconnection lines along the margins of cultivated areas to reduce the potential for conflict with farm operations. The certificate holder shall place aboveground collector lines and junction boxes along property lines and public road rights-of-way to the extent practicable. [Final Order on ASC, Condition 19; AMD2, AMD4]
GEN-LU-06	Where necessary and feasible, the certificate holder shall provide access to fields within the wind energy facility site and otherwise provide adequate and timely access to properties during critical periods in the farming cycle, such as harvest. [Final Order on ASC, Condition 19; AMD4]
GEN-LU-07	Before beginning construction of the wind energy facility, the certificate holder shall record a Farm Management Easement covering the properties on which the certificate holder locates wind power generation facilities. The certificate holder shall record the easements in the real property records of Sherman County and shall file a copy of the recorded easement with the Sherman County Planning Director.

Condition Number	General (GEN) Conditions
	[Final Order on ASC, Condition 19; AMD4]
GEN-LU-08	The certificate holder shall remove from Special Farm Assessment the portions of parcels on which facilities are located and shall pay all property taxes due and payable after the Special Farm Assessment is removed from such properties. [Final Order on ASC, Condition 19; AMD4]
GEN-LU-09	With respect to any turbine constructed within a micrositing corridor approved by the Council after November 21, 2007, the certificate holder shall not locate such turbine within the setback prescribed by Section 4 of the Sherman County Wind Power Set Back Ordinance (Ordinance No. 39-2007) unless the Council has approved a variance to such setback for the turbine or the certificate holder has negotiated a setback agreement with the affected adjacent property owner and wind project developer. [Final Order on AMD3, Condition 128; AMD4]
STANDARD: Fish and Wildlife Habitat (FW) [OAR 345-022-0060]	
GEN-FW-02	The certificate holder may construct turbines and other facility components within the 500-foot turbine corridors shown on Figures P-1 through P-10 of the site certificate application and March 2006 supplement and within the “Permitted Areas” and “Amendment III Areas” as shown on Figures 2, 2a, 2b and 2c of the Request for Amendment #3, subject to the following requirements addressing potential habitat impact: <ul style="list-style-type: none"> a. The certificate holder shall not construct any facility components within areas of Category 1 or Category 2 habitat and shall avoid temporary disturbance of Category 1 or Category 2 habitat. b. The certificate holder shall design and construct facility components that are the minimum size needed for safe operation of the energy facility. c. Prior to constructing any turbines or permanent related or supporting facilities within the northward extension of Corridor 3 shown on Figure 2a of the Request for Amendment #3, the certificate holder shall provide the Department with maps and calculations documenting the additional permanent impacts, if any, to Category 3 and Category 4 habitat predicted to result from construction. If the construction would result in additional permanent impacts, the certificate holder shall increase the area of mitigation for permanent loss of Category 3 and Category 4 habitat as described in the Habitat Mitigation Plan incorporated herein by GEN-FW-03. [Final Order on ASC, Condition 59; AMD3; AMD4]
GEN-FW-03	Before beginning construction of the facility, the certificate holder shall acquire the legal right to create, maintain and protect a habitat mitigation area for the life of the facility by means of an outright purchase, conservation easement or similar conveyance and shall provide a copy of the documentation to the Department. Within the habitat mitigation area, the certificate holder shall improve the habitat quality in accordance with the Habitat Mitigation Plan that is incorporated in the

Condition Number	General (GEN) Conditions
	Final Order on Amendment #3 as Attachment C and as may be amended from time to time. [Final Order on ASC, Condition 63; AMD2; AMD3; AMD4]
STANDARD: Historic, Cultural and Archaeological Resources (HC) [OAR 345-022-0090]	
GEN-HC-01	Before beginning construction of any phase of the facility, the certificate holder shall provide to the Department a map showing the final design locations of all components of that phase of the facility and areas that would be temporarily disturbed during construction and also showing the areas surveyed by CH2M Hill and Archaeological Investigations Northwest, Inc. (AINW) in preparing the Cultural Resources Surveys for Biglow Canyon Wind Farm included in the site certificate application as Attachment S-1 and in Request for Amendment #2 as Attachment 15. The certificate holder shall hire qualified personnel to conduct field investigation of all areas of permanent or temporary disturbance that CH2M Hill and AINW did not previously survey and shall provide to the Department a written report of the field investigation. If any significant historic, cultural or archaeological resources are found during the field investigation, the certificate holder shall ensure that construction and operation of the facility will have no impact on the resources. The certificate holder shall instruct all construction personnel to avoid areas where the resources were found and shall implement other appropriate measures to protect the resources. [Amendment #2]
STANDARD: Public Health and Safety for Wind Energy Facilities (PHSW) [OAR 345-024-0010]	
GEN-PHSW-01	Before beginning construction or alteration of any phase of the wind energy facility, the certificate holder shall submit a Notice of Proposed Construction or Alteration to the Federal Aviation Administration (FAA) identifying the proposed final locations of the turbines and related or supporting facilities for that phase of the facility. The certificate holder shall notify the Department of the FAA's response as soon as it has been received. [Final Order on ASC, Condition 38; AMD4]
GEN-PHSW-02	The certificate holder shall enclose the facility substation with appropriate fencing and locked gates to protect the public from electrical hazards. [Final Order on ASC, Condition 39; AMD4]
GEN-PHSW-03	The certificate holder shall not locate turbine towers within 450 feet of any residence. The certificate holder shall not locate turbine towers within 450 feet of any public road, unless the certificate holder demonstrates to the Department's satisfaction that a lesser setback is consistent with the protection of public health and safety. [Final Order on ASC, Condition 40; AMD4]
GEN-PHSW-04	The certificate holder shall construct turbine towers that are smooth steel structures with no exterior ladders or access to the turbine blades and shall install locked access doors accessible only to authorized personnel. [Final Order on ASC, Condition 41; AMD4]

Condition Number	General (GEN) Conditions
GEN-PHSW-08	<p>During construction of the wind energy facility, the certificate holder shall install generator step-up transformers at the base of each turbine tower in locked cabinets designed to protect the public from electrical hazards and to avoid creation of artificial habitat for raptor prey.</p> <p>[Final Order on ASC, Condition 45; AMD4]</p>
<i>Siting Standards for Wind Energy Facilities (WF) [OAR 345-024-0015]</i>	
GEN-WF-01	<p>The certificate holder shall construct turbines on concrete foundations and shall cover the ground within a minimum 10-foot radius with non-flammable material. The certificate holder shall maintain the non-flammable pad area covering throughout operation of the facility.</p> <p>[Final Order on ASC, Condition 48; AMD4]</p>
GEN-WF-03	<p>During construction of the wind energy facility, to reduce the visual impact of the facility, the certificate holder shall:</p> <ol style="list-style-type: none"> Paint turbine towers, nacelles, rotors, meteorological towers, and cabinets containing pad-mounted equipment with a low-reflectivity, neutral gray, white, off-white or earth tone finish to reduce contrast with the surrounding background. Apply a low-reflectivity finish to the exterior of the O&M buildings and substation equipment to control their visual integration into the surrounding background. With the exception of the turbine manufacturer's logo that may appear on turbine nacelles, not allow any advertising to be used on any part of the facility or on any signs posted at the facility. In addition, the certificate holder may place its logo on the nacelles of not more than 20 percent of the wind turbines. Use only those signs required by law or for facility safety or security, except that the certificate holder may erect a sign near the O&M facility or substation to identify the wind energy facility. <p>[Final Order on ASC, Condition 50; AMD2;AMD3; AMD4]</p>
GEN-WF-04	<p>The certificate holder shall design and construct the O&M buildings for the wind energy facility to be generally consistent with the character of similar buildings used by commercial farmers or ranchers in the area and shall paint the building in a neutral color to blend with the surrounding background.</p> <p>[Final Order on ASC, Condition 51; AMD3; AMD4]</p>
GEN-WF-05	<p>The certificate holder shall not use exterior nighttime lighting at the wind energy facility except:</p> <ol style="list-style-type: none"> The minimum turbine tower lighting required by the Federal Aviation Administration. Security lighting at the O&M buildings and substation, provided that such lighting is shielded or directed downward to reduce glare. Minimum lighting necessary for repairs or emergencies.

Condition Number	General (GEN) Conditions
	<p>d. Minimum lighting necessary for nighttime construction. The certificate holder may use lighting only at the work location and only directed downward to illuminate the work area at the turbine base or upward from the base to illuminate the turbine tower; construction lighting shall not be directed outward. The certificate holder shall use nighttime lighting only with the approval of the owner of the property on which the work is conducted and shall provide notice of nighttime construction to occupants of all residences within one-half mile of the construction site.</p> <p>[Final Order on ASC, Condition 52; AMD3]</p>
STANDARD: Siting Standards for Transmission Lines (TL) [OAR 345-024-0090]	
GEN-TL-03	<p>The certificate holder shall take reasonable steps to reduce or manage exposure to electromagnetic fields (EMF), consistent with Council findings presented in the “Report of EMF Committee to the Energy Facility Siting Council,” March 30, 1993, and subsequent findings. Effective on the date of this site certificate, the certificate holder shall provide information to the public, upon request, about EMF levels associated with the wind energy facility and its related transmission lines.</p> <p>[Final Order on ASC, Condition 38; AMD4]</p>
GEN-TL-04	<p>a. The certificate holder shall design, construct and operate transmission lines associated with the wind energy facility in accordance with the requirements of the National Electrical Safety Code (American National Standards Institute, Section C2, 1997 Edition); and</p> <p>b. The certificate holder shall develop and implement a program that provides reasonable assurance that all fences, gates, cattle guards, trailers, or other objects or structures of a permanent nature that could become inadvertently charged with electricity by the transmission lines are grounded or bonded throughout the life of the line.</p> <p>[Final Order on ASC, Condition 118; AMD3; AMD4]</p>
STANDARD: Other – Removal-Fill (WL)	
GEN-WL-01	<p>The certificate holder shall avoid any disturbance, including the placement of poles for the collector line, within 25 feet of the stream channel in the area identified as Crossing G in the Request for Amendment #2 and within a wetland area identified as “POWHX” on Figure J-1 of the site certificate application.</p> <p>[Final Order on AMD2, Condition 127; AMD4]</p>
GEN-WL-02	<p>The certificate holder shall avoid any disturbance within 25 feet of the stream channel in the area identified as “Stream Crossing H” in the Request for Amendment #3 and shall install any collector line through the area by tunneling or drilling beneath the stream channel.</p> <p>[Final Order on AMD3, Condition 129; AMD4]</p>

5.2 Operational (OPR) Conditions

Condition Number	Operational (OPR) Conditions
<i>STANDARD: Soil Protection (SP) [OAR 345-022-0020]</i>	
OPR-SP-03	The certificate holder shall cover turbine pad areas with gravel or other non-erosive material immediately following exposure and shall maintain the pad area covering during operation of the facility. [Final Order on ASC, Condition 28; AMD4]
OPR-SP-04	During operation of the wind energy facility, the certificate holder shall restore areas that are temporarily disturbed during facility maintenance or repairs according to the methods and monitoring procedures in the Revegetation Plan included as Attachment B to the Final Order on the ASC, as amended. [Final Order on ASC, Condition 29; AMD4]
OPR-SP-05	During operation of the wind energy facility, the certificate holder shall routinely inspect and maintain all roads, pads and trenched areas and, as necessary, maintain or repair erosion control measures. [Final Order on ASC, Condition 30; AMD4]
<i>STANDARD: Fish and Wildlife Habitat (FW) [OAR 345-022-0060]</i>	
OPR-FW-04	During operation of the wind energy facility, the certificate holder shall implement a plan to control the introduction and spread of noxious weeds. The certificate holder shall develop the weed control plan in consultation with the Sherman County Weed Control District and the Department. [Final Order on ASC, Condition 49; AMD4]
<i>STANDARD: Public Health and Safety for Wind Energy Facilities (PHSW) [OAR 345-024-0010]</i>	
OPR-PHSW-01	During operation of the wind energy facility, the certificate holder shall follow manufacturers' recommended handling instructions and procedures to prevent damage to towers or blades that could lead to failure. [Final Order on ASC, Condition 42; AMD4]
OPR-PHSW-02	During operation of the wind energy facility, the certificate holder shall have an operational safety-monitoring program and shall inspect turbine blades on a regular basis for signs of wear. The certificate holder shall repair turbine blades as necessary to protect public safety. [Final Order on ASC, Condition 43; AMD4]
OPR-PHSW-03	During operation of the wind energy facility, the certificate holder shall install and maintain self-monitoring devices on each turbine, connected to a fault annunciation panel or supervisory control and data acquisition (SCADA) system at the O&M facility, to alert operators to potential dangerous conditions, and the certificate holder shall remedy any dangerous conditions immediately. [Final Order on ASC, Condition 44; AMD4]
OPR-PHSW-04	During operation of the wind energy facility, the certificate holder shall maintain built-in fire prevention measures in each turbine that would shut down the turbine automatically before mechanical problems create excess heat or sparks.

Condition Number	Operational (OPR) Conditions
	[Final Order on ASC, Condition 92; AMD4]
OPR-PHSW-05	<p>During construction and operation of the wind energy facility, the certificate holder shall develop and implement fire management plans in consultation with local fire control authorities to minimize the risk of fire and to respond appropriately to any fires that occur on the facility site. In developing the fire management plans, the certificate holder should take into account the dry nature of the region and should address risks on a seasonal basis.</p> <p>[Final Order on ASC, Condition 93; AMD4]</p>
OPR-PHSW-06	<p>During construction and operation of the wind energy facility, the certificate holder shall ensure that each on-site company vehicle contains a fire extinguisher, water spray can, shovel, emergency response procedures book, and two-way radio for immediate communication with the O&M facility.</p> <p>[Final Order on ASC, Condition 94; AMD4]</p>
OPR-PHSW-07	<p>Upon beginning operation of the wind energy facility, the certificate holder shall provide to all local fire departments maps of the facility site. During operation of the facility, the certificate holder shall provide to all local fire departments the names and telephone numbers of facility personnel available to respond on a 24-hour basis in case of an emergency on the facility site.</p> <p>[Final Order on ASC, Condition 96; AMD4]</p>
OPR-PHSW-08	<p>During operation of the wind energy facility, the certificate holder shall ensure that all on-site employees receive annual fire prevention and response training by qualified instructors or members of the local fire department and that all employees are instructed to keep vehicles on roads and off dry grassland, except when off-road operation is required for emergency purposes.</p> <p>[Final Order on ASC, Condition 97; AMD4]</p>
OPR-PHSW-09	<p>During operation of the wind energy facility, the certificate holder shall comply with the written fire protection recommendations of the Fire Chief of the applicable Rural Fire Protection District and shall promptly provide to the Department any correspondence from the Fire Chief regarding those recommendations.</p> <p>[Final Order on ASC, Condition 98; AMD3, AMD4]</p>

6.0 Conditions Applicable to the Solar Facility

6.1 General (GEN) Conditions: Design, Construction and Operations

Condition Number	General (GEN) Conditions
STANDARD: Soil Protection (SP) [OAR 345-022-0022]	
GEN-SP-02	Except for those fuels and oils covered by an SPCC Plan approved under Condition PRE-SP-01 or PRO-SP-02, no reportable quantities of hazardous materials or

Condition Number	General (GEN) Conditions
	substances, as defined in OAR chapter 340, division 142, may be stored at the site of any solar facility component. [Final Order on AMD4, Soil Protection Condition 8]
STANDARD: Land Use (LU) [OAR 345-022-0030]	
GEN-LU-10	All aboveground components of the solar facility, including perimeter fences, must be setback at least 50 feet from: <ul style="list-style-type: none"> a. The right-of-way line of an arterial or major collector road or street, including, but not limited, to Hilderbrand Lane (Old Wasco-Heppner Highway); b. The property line extending along a public road not described in (a); and c. Any property line with a tract that is not within the Solar Micrositing Area or Solar Siting Area. [Final Order on AMD4; AMD5, Land Use Condition 1]
GEN-LU-11	All components of the solar facility, including perimeter fences, must be setback at least 30 feet from the aggregate site located on Tax lot 02N18E00003900, as identified in Sherman County Ordinance 32-2006. Facility components must be arranged in a manner that allows for continued access to and operation of the aggregate site. [Final Order on AMD4, Land Use Condition 2]
GEN-LU-12	<ul style="list-style-type: none"> a. All structures and equipment associated with the solar facility, including but not limited to, power conversion stations, O&M buildings, and battery enclosures, must be designed or painted with a low-reflectivity, neutral gray, white, off-white or earth tone finish that minimizes contrast with the surrounding landscape. b. The certificate holder may install a sign identifying the facility near each O&M building or collector substation. No other signs may be installed except as required by law or for facility safety or security c. All lighting installed at the O&M buildings, substation, or other facility components, shall be limited in intensity, shielded, and directed downward in a manner that prevents the lighting from projecting onto adjacent properties and roadways. Final Order on AMD4, Land Use Condition 4]
STANDARD: Historic, Cultural and Archaeological Resources (HC) [OAR 345-022-0090]	
GEN-HC-02	The certificate holder must design, construct, and operate the solar facility to avoid archaeological sites (35SH00173, 35SH00188, BSP-1-S01, BSP-1-S02, BSP-1-S04, BSP-1-S05, BSP-1-S10, and BSP-1-S12) and archaeological isolates (BSP-1-I01 and BSP-1-I04) with a 20-meter avoidance buffer. [Final Order on RFA4; AMD5, Historic, Cultural, and Archaeological Condition 1]
GEN-HC-03	<ul style="list-style-type: none"> a. Prior to construction, the certificate holder must submit to the Department for approval, in consultation with SHPO, a Cultural Resources Monitoring Plan demonstrating that an Oregon Qualified Archaeologist or Tribal Cultural Resource Monitor will be onsite during ground disturbing activities at the site. The plan

Condition Number	General (GEN) Conditions
	<p>may provide for exceptions to monitoring scope and frequency, subject to approval by the Department, in consultation with the Confederated Tribes of Warm Springs.</p> <p>b. During construction, the certificate holder shall adhere to the measures approved in the Cultural Resources Monitoring Plan.</p> <p>[Final Order on AMD4; AMD5, Historic, Cultural, and Archaeological Condition 2]</p>
STANDARD: Siting Standards for Transmission Lines (TL) [OAR 345-024-0090]	
GEN-TL-05	<p>The certificate holder shall construct the 230-kV transmission line connecting the Biglow Canyon Substation to the Fox Canyon Solar Substation within a 150-foot corridor and the 230 kV transmission line connecting the Fox Canyon Substation to the new substation within a 150-foot corridor, as presented in Figure 2 of the Amended Site Certificate.</p> <p>[Final Order on ASC, Condition 119; AMD4, AMD5]</p>
GEN-TL-06	<p>The certificate holder must design, construct, and operate transmission line associated with the solar facility in accordance with the requirements of the 2023 Edition of the National Electrical Safety Code.</p> <p>[Final Order on AMD4. Transmission Line Condition 1]</p>

6.2 Pre-Construction (PRE) Conditions

Condition Number	Preconstruction (PRE) Conditions
STANDARD: General Standard of Review (GS) [OAR 345-022-0000]	
PRE-GS-01	Except as necessary for the initial survey, the certificate holder shall not begin construction, as defined in OAR 345-001-0010, of the solar facility, or create a clearing on any part of the solar-Solar Micrositing a Area/Solar Siting Area until the certificate holder has construction rights on all parts of the area. For the purpose of this rule, “construction rights” means the legal right to engage in construction activities. [Final Order on ASC; Condition 105; AMD3; AMD4; AMD5 ; Mandatory Condition OAR 345-025-0006(5)]
STANDARD: Organizational Expertise (OE) [OAR 345-022-0010]	
PRE-OE-01	Prior to construction of any phase or component of the solar facility, the certificate holder shall notify the Department of the identity and qualifications of primary vendors; the engineering, procurement and construction contractors for specific portions of the work; and the identity and qualifications of the individuals that will manage and oversee the selected vendors and contractors. The certificate holder shall select vendors, contractors, and personnel dedicated to managing vendors and contractors that have substantial experience in the design and construction of similar facilities. The certificate holder shall report to the Department any change of major construction contractors or management personnel. [Final Order on ASC, Condition 1; AMD4]
PRE-OE-02	<p>a. Prior to construction of any component or phase of the solar facility, the certificate holder shall submit, to the Department for review and approval, a plan that verifies compliance with all site certificate terms and conditions and applicable statutes and rules. As a part of the compliance plan, to verify compliance with the requirement to begin construction by the date specified in the site certificate, the certificate holder shall report promptly to the Department of Energy when construction begins. Construction is defined in OAR 345-001-0010. In reporting the beginning of construction, the certificate holder shall describe all work on the site performed before beginning construction, and shall state the cost of that work. For the purpose of this condition, “work on the site” means any work within the Solar Micrositing Area/Solar Siting Area, other than surveying, exploration or other activities to define or characterize the site or corridor.</p> <p>b. The certificate holder shall implement the compliance plan prior to and during construction and make documentation of compliance available for inspection by the Department or the Council upon request.</p> <p>[Final Order on ASC, Condition 121 AMD3; AMD4; AMD5]</p>
PRE-OE-03	Prior to construction of any component or phase of the solar facility, the certificate holder shall:

Condition Number	Preconstruction (PRE) Conditions
	<p>a. Provide the Department a list of federal, state and local permits, including any third-party permits; and a schedule for obtaining identified permits.</p> <p>b. Once obtained, provide copies of all permits, including third-party permits to the Department.</p> <p>[Final Order on AMD4; Organizational Expertise Condition 4]</p>
STANDARD: Structural (SS) [OAR 345-022-0020]	
PRE-SS-01	<p>a. Prior to construction of any component or phase of the solar facility, the certificate holder shall submit, to the Department for review and comment, a final geotechnical report that, at a minimum, addresses the recommendations in the Preliminary-Final Geotechnical Engineering Report provided as RFA4, Exhibit H, Attachment H-2 prior to construction of the Solar Facility.</p> <p>b. The certificate holder shall prepare the report in accordance with the Oregon Board of Geologists Examiners 2014 Guidelines for Preparing Engineering Geologic Reports.</p> <p>c. The Department may utilize a third-party consultant in the review of the report. The certificate holder shall obtain concurrence from the Department that all comments have been adequately addressed before beginning construction.</p> <p>[Final Order on ASC, Condition 66; AMD4; AMD5]</p>
PRE-SS-02	<p>The certificate holder shall notify the Department, the State Building Codes Division and the Department of Geology and Mineral Industries promptly if investigations or trenching in the Solar Micrositing Area/Solar Siting Area reveal that conditions in the foundation rocks differ significantly from those described in Request for Amendment 4 or Request for Amendment 5. After the Department receives the notice, the Council may require the certificate holder to consult with the Department of Geology and Mineral Industries and the Building Codes Division and to propose mitigation actions.</p> <p>[OAR 345-027-0020(13); Final Order on ASC, Condition 113; AMD3; AMD4; AMD5]</p>
PRE-SS-03	<p>The certificate holder shall notify the Department, the State Building Codes Division and the Department of Geology and Mineral Industries promptly if shear zones, artesian aquifers, deformations or clastic dikes are found at or in the vicinity of the Solar Micrositing Area/Solar Siting Area.</p> <p>[OAR 345-027-0020(14); Final Order on ASC, Condition 114; AMD3; AMD4; AMD5]</p>
STANDARD: Soil Protection (SP) [OAR 345-022-0020]	
PRE-SP-01	<p>Prior to beginning construction of any component or phase of the solar facility, the certificate holder shall:</p> <p>a. Finalize the draft Comprehensive Solar Revegetation and Soil Management Plan included as Attachment _ to the Final Order on AMD5 based on final facility design and the approved National Pollutant Discharge Elimination System (NPDES) General Permit 1200-C for the facility. The final Comprehensive Solar Revegetation and Soil Management Plan shall be submitted to the Department for review and approval.</p>

Condition Number	Preconstruction (PRE) Conditions
	<p>b. Complete all items included in the Pre-construction Compliance Checklist in the final plan, as applicable to the facility components or phase. [Final Order on AMD4; AMD5, Soil Protection Condition 1]</p>
PRE-SP-02	<p>Prior to beginning construction of any component or phase of the solar facility, the certificate holder shall submit, to the Department, a Construction Spill Prevention, Control and Countermeasure (SPCC) Plan that complies with the requirement of 40 CFR 112. [Final Order on AMD4, AMD 5, Soil Protection Condition 4]</p>
STANDARD: Land Use (LU) [OAR 345-022-0030]	
PRE-LU-01	<p>a. Prior to construction of any component or phase of the solar facility, the certificate holder shall submit, to the Department and the Sherman County Planning Commission, an application for an updated Conditional Use Permit to reflect the site facility plan in RFA 5 and the requirements of SCZO Section 5.4(1) and (3). b. The Site Plan required under SCZO 5.4(1) must demonstrate compliance with all site certificate conditions and the local applicable substantive criteria addressed in the Final Order on AMD4 and the Final Order on AMD5. [Final Order on AMD4, AMD5, Land Use Condition 3]</p>
PRE-LU-02	<p>Prior to construction of any component or phase of the solar facility, the certificate holder must sign and record in the deed records for the county a document binding the project owner and the project owner's successors in interest, prohibiting them from pursuing a claim for relief or cause of action alleging injury from farming or forest practices as defined in ORS 30.930(2) and (4). [Final Order on AMD4, Land Use Condition 5]</p>
PRE-LU-03	<p>Prior to construction of the solar facility approved in the Final Order on Amendment 4, component or phase, as applicable, the certificate holder shall submit to the Department:</p> <p>a. A Memorandum of Understanding or other agreement executed by the certificate holder, Mid-Columbia Community Economic Development District, and Sherman County, establishing a Community Investment Fund in accordance with the Community Investment Plan included as Attachment E to the Final Order on RFA4 Amendment 4.</p> <p>b. Evidence that that the certificate holder has contributed at least \$1,600 per acre of cultivated land that will be occupied by facility components to the Community Investment Fund. [Final Order on AMD4, Land Use Condition 6]</p>
STANDARD: Retirement and Financial Assurance (RF) [OAR 345-022-0050]	
PRE-RF-01	<p>Prior to construction of the solar facility, component or phase, as applicable, the certificate holder shall:</p> <p>a. Submit to the Department Table 14 (Retirement Table with tasks/unit/unit costs) of the Final Order on AMD5, updated based on final design and phased</p>

Condition Number	Preconstruction (PRE) Conditions
	<p>construction, if applicable. Certificate holder may not make changes to the unit cost without review and approval by the Department. Certificate holder must also request that the Department confirm the present-day inflation adjusted decommissioning estimate, rounded to the nearest \$1,000, to be reflected in the bond or letter of credit in sub c of this condition.</p> <p>b. Incorporate any additional decommissioning costs for facility changes which have been determined by the Department not to require a site certificate amendment.</p> <p>c. Submit to the Department a bond or letter of credit, in the amount affirmed by the Department under (a), based on the Council's current pre-approved financial institution list and form.</p> <p>[Final Order on AMD4, Retirement and Financial Assurance Condition 1]</p>
STANDARD: Fish and Wildlife Habitat (FW) [OAR 345-022-0060]	
PRE-FW-01	<p>Prior to construction of a phase or component of the solar facility, as applicable, the certificate holder shall submit the final Habitat Mitigation Plan substantially similar to Final Order on AMD45 Attachment F, based on the finalization requirements included in Section 2.0 of the plan. The final plan must be submitted for review and approval by the Department in consultation with ODFW.</p> <p>[Final Order on AMD4, AMD5, Fish and Wildlife Habitat Condition 1]</p>
STANDARD: Historic, Cultural and Archeological (HC) [OAR 345-022-0090]	
PRE-HC-01	<p>Prior to construction, the certificate holder shall update the contact information provided in the Final Order on ASC AMD 5 Attachment H, Inadvertent Discovery Plan.</p> <p>[Final Order on AMD4; AMD5, Historic, Cultural and Archeological Condition 3]</p>
STANDARD: Public Services (PS) [OAR 345-022-0100]	
PRE-PS-01	<p>At least 90-days prior to construction of a phase or component of the solar facility, the certificate holder shall provide to the Department and Sherman County a Construction Workforce Housing Plan. The Construction Workforce Housing Plan must include:</p> <p>a. An evaluation of ongoing patterns of housing uses and potential shortages or changes in housing demand;</p> <p>b. Consideration of concerns and suggestions from Sherman County; and</p> <p>c. Provide strategies to minimize impacts to the local housing supply.</p> <p>[Final Order on AMD4, Public Services Condition 1]</p>
PRE-PS-02	<p>Prior to construction of any phase or component of the solar facility, the certificate holder shall:</p> <p>a. Provide an executed Road Use Agreement between the certificate holder and with the Sherman County Public Works Department for the phase or component, which includes, at a minimum:</p> <p>i. A system for documenting the pre-construction condition of local roads that would serve as transportation routes for delivering equipment to the facility site so that pre-construction conditions can be compared with conditions after</p>

Condition Number	Preconstruction (PRE) Conditions
	<p>construction has been completed to assess needed repairs and payment for repairs.</p> <ul style="list-style-type: none"> ii. Protocols for monitoring road conditions for degradation during construction so that safe travel paths may be maintained. iii. An agreement to fund repairs of construction related damage to the satisfaction of Sherman County Public Works. <p>b. Submit a Construction Traffic Management Plan for Department review and approval. Unless the following are included in the executed Road Use Agreement, the plan shall, at a minimum, require that the certificate holder:</p> <ul style="list-style-type: none"> i. Provide notice to adjacent landowners when construction takes place to help minimize access disruptions; ii. Provide proper road signage and warnings of “Equipment on Road,” “Truck Access,” or “Road Crossings;” iii. Implement traffic diversion equipment, such as advance signage and pilot cars, whenever possible when slow or oversized loads are being hauled; iv. Encourage carpooling for the construction workforce to reduce traffic volume; v. Employ flaggers, as necessary, to direct traffic when large equipment is entering or exiting public roads to minimize risk of accidents; and vi. Maintain at least one travel lane at all times so that roadways will not be closed to traffic as a result of construction vehicles entering or exiting public roads. <p>[Final Order on ASC, Condition 77; AMD1; AMD4]</p>
STANDARD: Wildfire Prevention and Risk Mitigation (WF) [OAR 345-022-0115]	
PRE-WF-01	<p>Prior to construction of any component or phase of the solar facility, the certificate holder shall finalize and submit to the Department, for review and approval, a Construction Wildfire Mitigation Plan (WMP), consistent with Attachment G to the Final Order on AMD4⁵.</p> <p>[Final Order on AMD4, AMD5, Wildfire Prevention and Risk Mitigation Condition 1]</p>
STANDARD: Waste Minimization (WM) [OAR 345-022-0120]	
PRE-WM-01	<p>Prior to construction of any component or phase of the solar facility, the certificate holder shall submit a Construction Waste Management Plan, for review and approval by the Department. The plan must include, at a minimum, the following:</p> <ul style="list-style-type: none"> a. The format, content and frequency of employee trainings to minimize and recycle solid waste; b. Practices and measures that will be implemented to minimize the generation of wastes from construction; c. Identify a procedure or process for evaluating whether photovoltaic modules, batteries, or other facility components are considered hazardous waste under state or federal regulations;

Condition Number	Preconstruction (PRE) Conditions
	<ul style="list-style-type: none"> d. Identify procedures for the segregation of recyclable materials, non-hazardous waste, and hazardous waste for transport and disposal by a licensed hauler specializing in the proper recycling or disposal of the wastes. e. Identify names and locations of licensed haulers and facilities that will be used for the following, including associated collection and hauling protocols and requirements: <ul style="list-style-type: none"> i. Recycling steel and other metal scrap; ii. Recycling wood waste; iii. Recycling packaging wastes, such as paper and cardboard; iv. Collecting non-recyclable waste for transport to a landfill by a licensed waste hauler; and f. Identify inspection and recordkeeping procedures for waste handling, disposal and recycling. g. Include a provision allowing for updates of the plan, subject to Department review and approval. <p>[Final Order on ASC, Condition 84; AMD4]</p>
STANDARD: Noise Control Regulations (NC) [OAR 340-035-0035]	
PRE-NC-01	<p>Prior to beginning construction of any noise generating equipment, the certificate holder shall provide an updated acoustic modeling analysis based on final facility design and equipment specifications demonstrating that the cumulative operational noise levels of the wind and solar facility, taking into account any necessary acoustic mitigation, will comply with the maximum permissible noise level, 50 dBA L50</p> <p>[Final Order on AMD4, Noise Control Condition 1]</p>
PRE-NC-02	<p>Prior to construction of the solar facility, the certificate holder must submit to the Department copies of executed legally effective easement(s) or real covenant(s) for all Noise Sensitive Properties impacted by the facility with noise exceedance.</p> <p>[OAR 340-035-0035(1)(b)(B)(iii); Final Order on AMD4; Noise Control Condition 1]</p>
STANDARD: Other – Removal-Fill (WL)	
PRE-WL-01	<ul style="list-style-type: none"> a. Certificate holder shall flag and avoid, or develop constraints mapping, identifying a 50-foot avoidance buffer from the delineated boundary of wetland WT03 and intermittent waterway ST04 (Wetland Delineation Report WD #2025-0012) to ground disturbing activities. b. Prior to August 12, 2030, if construction of the solar facility has not yet commenced, the certificate holder must submit a renewal request to DSL for Wetland Delineation Report WD #2025-0012. Certificate holder must provide a copy of DSL reissuance to the Department, once obtained. <p>[Final Order on AMD4, Removal-Fill Condition 1]</p>
STANDARD: Other – Water Rights (WR)	

6.3 Construction (CON) Conditions

Condition Number	Construction (CON) Conditions
STANDARD: GENERAL STANDARD (GS) [OAR 345-022-0000]	
CON-GS-01	<p>The certificate holder must begin construction of the solar facility, phase or component on or before March 27, 2032[date]. Within 7 days of construction commencement, the certificate holder must provide the Department with written verification that it has met the deadline by satisfying applicable preconstruction conditions and completing at least \$250,000 work in the Solar Micrositing Area/Solar Siting Area.</p> <p>[OAR 345-025-0006(4), Final Order on AMD4, AMD5, General Standard Condition 1]</p>
CON-GS-02	<p>The certificate holder must complete construction of the facility, phase or component within 3 years of the actual applicable construction commencement date for the facility or applicable phase reported under Condition CON-GS-01. Within 7 days after completing construction, the certificate holder shall provide the Department written verification that it has met the deadline.</p> <p>[OAR 345-025-0006(4), Final Order on AMD4, General Standard Condition 2]</p>
STANDARD: Organizational Expertise (OE) [OAR 345-022-0010]	
CON-OE-01	<p>During construction of any component or phase of the solar facility, the certificate holder shall:</p> <ol style="list-style-type: none"> Maintain a qualified on-site construction manager with demonstrated experience in environmental compliance; Require the construction manager to ensure compliance with all construction-related site certificate conditions. Notify the Department of the name, telephone number, and e-mail address of the manager within 72 hours after any change in this information. <p>[Final Order on ASC, Condition 3; AMD4]</p>
CON-OE-02	<ol style="list-style-type: none"> Within three months after beginning construction of any phase or component of the solar facility, and every three months thereafter during construction, the certificate holder shall submit a construction progress report to the Department. Each construction progress report shall describe: <ol style="list-style-type: none"> Any significant changes to major milestones for construction; Facility Status: An overview of site conditions, the status of facilities under construction, and a summary of the operating experience of facilities that are in operation. In this section of the annual report, the certificate holder shall describe any unusual events, such as earthquakes, extraordinary windstorms, major accidents or the like that occurred during the year and that had a significant adverse impact on the facility. Status of Surety Information: Documentation demonstrating that bonds or letters of credit as described in the site certificate are in full force and effect and will remain in full force and effect for the term of the next reporting period;

Condition Number	Construction (CON) Conditions
	<ul style="list-style-type: none"> iv. Monitoring Report: A list and description of all significant monitoring and mitigation activities performed during the reporting period in accordance with site certificate terms and conditions, a summary of the results of those activities, and a discussion of any significant changes to any monitoring or mitigation program, including the reason for any such changes. v. Compliance Report: A description of all instances of noncompliance with a site certificate condition. For ease of review, the certificate holder shall, in this section of the report, use numbered subparagraphs corresponding to the applicable sections of the site certificate. vi. Facility Modification Report: A summary of changes to the facility that the certificate holder has determined do not require a site certificate amendment in accordance with OAR 345-027-0050. <p>c. When the reporting date coincides, the certificate holder may include the construction progress report within the annual report required under Condition OPR-OE-01.</p> <p>[Final Order on AMD4, Organizational Expertise Condition 3]</p>
STANDARD: Structural Standard (SS) [OAR 345-022-0020]	
CON-SS-01	<p>The certificate holder shall design and construct the solar facility in accordance with the applicable requirements of the International Building Code, Oregon Structural Specialty Code, and any other applicable codes and design procedures in effect at the time of construction.</p> <p>[Final Order on ASC, Condition 67; AMD4]</p>
CON-SS-02	<p>The certificate holder shall design, engineer and construct the solar facility to avoid dangers to human safety and the environment presented by seismic hazards affecting the site that are expected to result from all maximum probable seismic events. As used in this condition “seismic hazard” includes ground shaking, ground failure, landslide, liquefaction triggering and consequences (including flow failure, settlement buoyancy, and lateral spreading), cyclic softening of clays and silts, fault rupture, directivity effects and soil-structure interaction.</p> <p>[OAR 345-027-0020(12); Final Order on ASC, Condition 112; AMD4]</p>
CON-SS-03	<p>The certificate holder shall design, engineer and construct the solar facility to avoid dangers to human safety presented by non-seismic hazards, including, but not limited to, landslides, flooding, erosion, and collapsible soils. Ground disturbing activities are not permitted in areas within Sherman County’s Natural Hazard Combining Zone where slopes exceed 20 percent.</p> <p>[Final Order on ASC, Condition 68; AMD4]</p>
STANDARD: Soil Protection (SP) [OAR 345-022-0022]	
CON-SP-01	<p>Upon completion of construction of the solar facility, the certificate holder shall restore vegetation to the extent practicable and shall landscape all areas disturbed by construction in a manner compatible with the surroundings and proposed use. Upon completion of construction, the certificate holder shall remove all temporary</p>

Condition Number	Construction (CON) Conditions
	structures not required for facility operation and dispose of all timber, brush, refuse and flammable or combustible material resulting from clearing of land and construction of the facility. [OAR 345-027-0020(11); Final Order on ASC, Condition 111; AMD3; AMD4]
CON-SP-02	During and following construction of any component or phase of the solar facility, the certificate holder shall conduct all work in compliance with the Comprehensive Solar Revegetation and Soil Management Plan required under Condition PRE-SP-01. [Final Order on AMD4, Soil Protection Condition 2]
CON-SP-03	During construction of the solar facility, the certificate holder and all onsite contractors and personnel shall adhere to the requirements of the SPCC Plan approved under Condition PRE-SP-02. Updates or revisions to the Plan shall be submitted to the Department prior to implementation. [Final Order on AMD4, Soil Protection Condition 5]
STANDARD: Retirement and Financial Assurance (RF) [OAR 345-022-0050]	
CON-RF-01	If construction extends more than 12 months, the certificate holder shall: <ul style="list-style-type: none"> a. Annually adjust the amount of the bond or letter of credit to present dollar value, as determined by the Department. b. Incorporate any additional decommissioning costs for proposed facility changes which have been determined by the Department not to require a site certificate amendment. c. The Department and Council reserve the right to adjust the contingencies, as appropriate and necessary to ensure that costs to restore the site are adequate to maintain health and safety of the public and environment. [Final Order on AMD4, Retirement and Financial Assurance Condition 2]
STANDARD: Fish and Wildlife Habitat (FW) [OAR 345-022-0060]	
CON-FW-01	<ul style="list-style-type: none"> a. Prior to the seasonal restriction referred in this condition and during any year in which construction of any component or phase of the solar facility occurs, the certificate holder shall: <ul style="list-style-type: none"> i. Use a protocol approved by ODFW to determine whether there are any active nests of the species listed in the table below within a half-mile of any areas that would be disturbed during construction. ii. If a nest is occupied by any of these species after the beginning of the seasonal restriction, the certificate holder shall not engage in high-impact construction activities (activities that involve blasting, grading or other major ground disturbance) or allow high levels of construction traffic within the spatial buffer of the nest site while the nest is active. iii. Any work areas within the spatial buffers during the seasonal restriction shall be flagged/marked. b. The seasonal restrictions are as provided in the table below:

Condition Number	Construction (CON) Conditions																																																														
		<table><tr><th>Species</th><th>Spatial Buffer</th><th>Seasonal Restriction</th><th>Early Release Date if Unoccupied</th></tr><tr><td>Golden eagle</td><td>0.5 – 1 mile</td><td>Feb 1 – Aug 15</td><td>May 15</td></tr><tr><td>Bald eagle</td><td>0.5 mile</td><td>Jan 1 – Aug 15</td><td>May 31</td></tr><tr><td>Ferruginous hawk</td><td>0.5 mile</td><td>Mar 15 – Aug 15</td><td>May 31</td></tr><tr><td>Northern goshawk**</td><td>0.5 mile</td><td>May 1 – Aug 15</td><td>June 30</td></tr><tr><td>Peregrine falcon**</td><td>0.25 mile</td><td>Jan 1 – Jul 1</td><td>May 15</td></tr><tr><td>Swainson’s hawk**</td><td>0.25 mile</td><td>Apr 1 – Aug 15</td><td>May 31</td></tr><tr><td>White-tailed kite</td><td>0.25 mile</td><td>Jan 1 – Aug 15</td><td></td></tr><tr><td>Osprey</td><td>0.25 mile</td><td>Mar 1 – Sep 15</td><td></td></tr><tr><td>Burrowing owl**</td><td>0.25 mile</td><td>Apr 1 – Aug 15</td><td>May 31</td></tr><tr><td>Flammulated owl**</td><td>0.25 mile</td><td>May 1 – Jul 31</td><td>June 15</td></tr><tr><td>Great gray owl**</td><td>0.25 mile</td><td>Apr 1 – Jul 31</td><td>May 31</td></tr><tr><td>Red-tailed hawk</td><td>0.10 mile</td><td>Mar 1 – Aug 15</td><td>May 31</td></tr><tr><td>Other hawks and owls</td><td>0.25 mile</td><td>Mar 1 – Aug 15</td><td>May 31</td></tr><tr><td colspan="4">Dates cover territory establishment through fledging. Release dates can be used for unoccupied or failed nests. Some geographic variation exists in seasonal restriction dates, please consult with local ODFW staff. ** Indicates Oregon Conservation Strategy Species.</td></tr></table>	Species	Spatial Buffer	Seasonal Restriction	Early Release Date if Unoccupied	Golden eagle	0.5 – 1 mile	Feb 1 – Aug 15	May 15	Bald eagle	0.5 mile	Jan 1 – Aug 15	May 31	Ferruginous hawk	0.5 mile	Mar 15 – Aug 15	May 31	Northern goshawk**	0.5 mile	May 1 – Aug 15	June 30	Peregrine falcon**	0.25 mile	Jan 1 – Jul 1	May 15	Swainson’s hawk**	0.25 mile	Apr 1 – Aug 15	May 31	White-tailed kite	0.25 mile	Jan 1 – Aug 15		Osprey	0.25 mile	Mar 1 – Sep 15		Burrowing owl**	0.25 mile	Apr 1 – Aug 15	May 31	Flammulated owl**	0.25 mile	May 1 – Jul 31	June 15	Great gray owl**	0.25 mile	Apr 1 – Jul 31	May 31	Red-tailed hawk	0.10 mile	Mar 1 – Aug 15	May 31	Other hawks and owls	0.25 mile	Mar 1 – Aug 15	May 31	Dates cover territory establishment through fledging. Release dates can be used for unoccupied or failed nests. Some geographic variation exists in seasonal restriction dates, please consult with local ODFW staff. ** Indicates Oregon Conservation Strategy Species.				
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	c. Upon request by the certificate holder, the Department in consultation with ODFW may provide exceptions to this restriction. The certificate holder’s request must include a justification of the request, including any actions the certificate holder will take to avoid, minimize, or mitigate impacts to the raptor and its nest. [Final Order on AMD4, AMD5 ; Fish and Wildlife Condition 3]																																																														
STANDARD: Historic, Cultural and Archeological (HC) [OAR 345-022-0090]																																																															
CON-HC-01	During construction, the certificate holder shall require all onsite employees and contractors to implement and adhere to the requirements of the Inadvertent Discovery Plan, as submitted to the Department under Condition PRE-HC-01. [Final Order on AMD4; Historic, Cultural and Archeological Condition 3]																																																														
STANDARD: Public Services (PS) [OAR 345-022-0100]																																																															
CON-PS-01	Prior to and during construction of any component or phase of the solar facility, as applicable, the certificate holder and its contractors shall: a. Identify all water-related needs and estimate daily and annual water demand for facility construction. b. Provide evidence such as a contract or purchase agreement demonstrating that adequate water supply to meet facility construction demand has been secured and that water for all construction activities will be legally obtained by service providers or third-party permits. Compliance may also be demonstrated by providing documentation showing water purchases from the legal water sources																																																														

Condition Number	Construction (CON) Conditions
	<p>with which the certificate holder and its contractors currently have agreements or approvals.</p> <p>[Final Order on ASC, Condition 74; AMD4, AMD 5]</p>
CON-PS-02	<p>During construction of a phase or component of the solar facility, the certificate holder shall report on the implementation of the Construction Workforce Housing Plan required under PRE-PS-01, including any outstanding issues associated with workforce housing and potential solutions.</p> <p>[Final Order on AMD4, Public Services Condition 2]</p>
CON-PS-03	<p>During construction of the solar facility, the certificate holder shall require that all on-site construction contractors develop and implement a site health and safety plan that informs on-site workers and others what to do in case of an emergency and that includes the locations of fire extinguishers and nearby hospitals, important telephone numbers, and first aid techniques.</p> <p>[Final Order on ASC, Condition 46; AMD4]</p>
CON-PS-04	<p>During and following construction of a phase or component of the solar facility, the certificate holder shall adhere to the requirements of the Road Use Agreement and Construction Traffic Management Plan required under Condition PRE-PS-02.</p> <p>[Final Order on ASC, Condition 78; AMD4]</p>
STANDARD: Wildfire Prevention and Risk Mitigation (WF) [OAR 345-022-0115]	
CON-WF-01	<p>During construction of the solar facility, the certificate holder shall require onsite contractors and employees to adhere to the Construction Wildfire Mitigation Plan (WMP) approved under Condition PRE-WF-01.</p> <p>[Final Order on AMD4, Wildfire Prevention and Risk Mitigation Condition 2]</p>
STANDARD: Waste Minimization (WM) [OAR 345-022-0120]	
CON-WM-01	<p>During construction of a component or phase of the solar facility, the certificate holder and all onsite contractors must implement the Construction Waste Management Plan required under Condition PRE-WM-01.</p> <p>[Final Order on AMD4, Waste Minimization Condition 1]</p>
CON-WM-02	<p>During construction of the facility, the certificate holder shall provide portable toilets for on-site sewage handling and shall ensure that the portable toilets are pumped and cleaned regularly by a qualified licensed contractor.</p> <p>[Final Order on ASC, Condition 82, AMD4]</p>
Standard: Noise Control, OAR 340-035-0035	
CON-NC-01	<p>During construction of the solar facility, the certificate holder shall:</p> <ol style="list-style-type: none"> Confine the noisiest operation of heavy construction equipment to the daylight hours; Require contractors to install and maintain exhaust mufflers on all combustion engine-powered equipment; and Establish a complaint response system at the construction manager's office to address noise complaints. <p>[Final Order on ASC, Condition 89; AMD4]</p>

Condition Number	Construction (CON) Conditions
STANDARD: Other – Water Rights (WR)	
CON-WR-01	No later than 30 days after completing construction of any new well, the certificate holder shall provide the Department a copy of the map, well log and all other information it provided to OWRD pursuant to ORS 537.545 and ORS 537.765 to qualify for an exempt ground water use for any onsite exempt wells. [Final Order on AMD4, Water Rights Condition 1]

6.4 Pre-Operational (PRO) Conditions

Condition Number	Pre-Operational (PRO) Conditions
STANDARD: Organizational Expertise (OE) [OAR 345-022-0010]	
PRO-OE-01	Prior to beginning operation of the solar facility, the certificate holder shall submit a final Operation and Maintenance Plan to the Department for review and approval. The plan must be finalized in accordance with Table 1 of the O&M Framework provided in Attachment C to the Final Order on AMD4. [Final Order on AMD4, Organizational Expertise Condition 1]
STANDARD: Soil Protection (SP) [OAR 345-022-0020]	
PRO-SP-01	Prior to beginning operation of the solar facility, the certificate holder shall submit, to the Department, an Operations Spill Prevention, Control and Countermeasure Plan that complies with the requirement of 40 CFR 112. [Final Order on AMD4, Soil Protection Condition 6]
STANDARD: Wildfire Prevention and Risk Mitigation (WF) [OAR 345-022-0115]	
PRO-WF-01	<p>a. Prior to operation of the solar facility, phase or component, as applicable, the certificate holder shall submit, to the Department for review and approval, an Operational Wildfire Mitigation Plan that complies with the requirements of OAR 345-022-0115(1)(b).</p> <p>b. The certificate holder may rely on a Wildfire Protection Plan approved by the Oregon Public Utility Commission under OAR chapter 860, division 300, or another plan approved by the Department in accordance with this Site Certificate to satisfy some or all of the requirements of this condition.</p> <p>[Final Order on AMD4, Wildfire Prevention and Risk Mitigation Condition 3]</p>

6.5 Operational (OPR) Conditions

Condition Number	Operational (OPR) Conditions
STANDARD: General Standard of Review (GS) [OAR 345-022-0000]	
OPR-GS-01	The certificate holder shall submit an updated legal description of the site to the Department of Energy within 90 days after beginning operation of the solar facility.

Condition Number	Operational (OPR) Conditions
	The legal description required by this rule means a description of metes and bounds or a description of the site by reference to a map and geographic data that clearly and specifically identifies the outer boundaries that contain all parts of the facility. [OAR 345-027-0020(2); Final Order on ASC, Condition 102; AMD3; AMD4]
STANDARD: Organizational Expertise (OE) [OAR 345-022-0010]	
OPR-OE-02	During operation of the solar facility, the certificate holder shall require onsite contractors and employees to adhere to the O&M Plan approved under Condition PRO-OE-01. The O&M Plan may be amended, subject to Department review and approval. [Final Order on AMD4, Operational Expertise Condition 2]
STANDARD: Soil Protection (SP) [OAR 345-022-0020]	
OPR-SP-06	During operation of the solar facility, the certificate holder shall monitor and maintain vegetation and any necessary erosion controls in compliance with the Comprehensive Solar Revegetation and Soil Management Plan required under Condition PRE-SP-01, as amended. The certificate holder shall include any reports required by the plan in the annual facility operations reports required under Condition OPR-OE-01. [Final Order on AMD4, Soil Protection Condition 3]
OPR-SP-07	During operation of the solar facility, the certificate holder and all onsite contractors and personnel shall adhere to the requirements of the Operations Spill Prevention, Control and Countermeasure Plan approved under Condition PRO-SP-01. Updates or revisions to the Plan shall be submitted to the Department prior to implementation. [Final Order on AMD4, Soil Protection Condition 7]
STANDARD: Fish and Wildlife Habitat (FW) [OAR 345-022-0060]	
OPR-FW-05	During operation of the solar facility, the certificate holder shall implement the Habitat Mitigation Plan finalized under Condition PRE-FW-01. The HMP may be amended from time to time, subject to Department approval. [Final Order on AMD4, Fish and Wildlife Habitat Condition 2]
STANDARD: Historic, Cultural and Archeological (HC) [OAR 345-022-0090]	
OPR-HC-01	During operations, the certificate holder shall require all onsite employees and contractors to implement and adhere to the requirements of the Inadvertent Discovery Plan, as provided in Condition PRE-HC-01. The IDP shall be reviewed and updated annually for current contact information. [Final Order on AMD4; Historic, Cultural and Archeological Condition 5]
STANDARD: Wildfire Prevention and Risk Mitigation (WF) [OAR 345-022-0115]	
OPR-WF-01	During operation of the solar facility, the certificate holder must adhere to the requirements of the Operational Wildfire Mitigation Plan approved by the Department under Condition PRO-WF-01, as updated in accordance with the requirements of the plan. [Final Order on AMD4, Wildfire Prevention and Risk Mitigation Condition 4]

7.0 Successors and Assigns

To transfer this site certificate, or any portion thereof, or to assign or dispose of it in any other manner, directly or indirectly, the certificate holder shall comply with OAR 345-027-0100.

8.0 Severability and Construction

If any provision of this agreement and certificate is declared by a court to be illegal or in conflict with any law, the validity of the remaining terms and conditions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if the agreement and certificate did not contain the particular provision held to be invalid. In the event of a conflict between the conditions contained in this site certificate and the Council's final order, the conditions contained in this site certificate shall control.

9.0 Governing Law and Forum

This site certificate shall be governed by the laws of the State of Oregon. Any litigation or arbitration arising out of this agreement shall be conducted in an appropriate forum in Oregon.

10.0 Execution

This site certificate may be executed in counterparts and will become effective upon signature by the Chair of the Energy Facility Siting Council and the authorized representative of the certificate holder.

IN WITNESS THEREOF, this site certificate has been executed by the State of Oregon, acting by and through the Energy Facility Siting Council, and by Portland General Electric Company.

ENERGY FACILITY SITING COUNCIL

By: _____

Cindy Condon, Chair

Date: _____

PORTLAND GENERAL ELECTRIC COMPANY

By: _____

Authorized Representative

Date: _____

ATTACHMENT 1: FIGURES

Attachment 2. Property Owner List

Map Tax Lot	Owner	Mailing Address	City	State	Zip	Full Mailing Address
01N17E00002901	OREGON DEPARTMENT OF AVIATION	UNKNOWN				UNKNOWN
02N18E00003900	SCHARF, R & A LLC	7695 TUCKER ROAD	AMITY	OR	97101	7695 TUCKER ROAD AMITY, OR 97101
02N18E00004000	SCHARF, R & A LLC	7695 TUCKER ROAD	AMITY	OR	97101	7695 TUCKER ROAD AMITY, OR 97101
02N18E00004300	SCHARF, R & A LLC	7695 TUCKER ROAD	AMITY	OR	97101	7695 TUCKER ROAD AMITY, OR 97101
02N18E00004400	SCHARF, R & A LLC	7695 TUCKER ROAD	AMITY	OR	97101	7695 TUCKER ROAD AMITY, OR 97101
02N17E00003400	SKILES, SHAWN	PO BOX 32	DUFUR	OR	97021	PO BOX 32 DUFUR, OR 97021
02N17E00004800	SKILES, SHAWN	PO BOX 32	DUFUR	OR	97021	PO BOX 32 DUFUR, OR 97021
02N17E00005000	OMW, LLC	PO BOX 341	DUFUR	OR	97021	PO BOX 341 DUFUR, OR 97021
02N17E00004901	MACNAB, JOSHUA & ASHLEY	PO BOX 7129	INDIANAPOLIS	IN	46207	PO BOX 7129 INDIANAPOLIS, IN 46207
01N17E00003300	RICE KEITH, CHRISTINE TRUST	PO BOX 583199	MINNEAPOLIS	MN	55458	PO BOX 583199 MINNEAPOLIS, MN 55458-3199
02N17E00008200	SIMPSON, RICHARD & NANCY	PO BOX 370	MORO	OR	97039	PO BOX 370 MORO, OR 97039
02N17E00008201	CAMPBELL, STEPHEN TRUST FARM & CABIN	PO BOX 370	MORO	OR	97039	PO BOX 370 MORO, OR 97039
01N17E00002900	SMITH, LAWRENCE L	22 AREY'S LANE	ORLEANS	MA	2653	22 AREY'S LANE ORLEANS, MA 02653
02N18E00004302	PORTLAND GENERAL ELECTRIC	121 SW SALMON ST 1WTC0404	PORTLAND	OR	97204	121 SW SALMON ST 1WTC0404 PORTLAND, OR 97204
02N18E00004303	PORTLAND GENERAL ELECTRIC	121 SW SALMON ST 1WTC0404	PORTLAND	OR	97204	121 SW SALMON ST 1WTC0404 PORTLAND, OR 97204
02N18E00004600	KAUFMAN, DARLENE JANIS SMITH	2202 NE 156TH AVE	PORTLAND	OR	97230	2202 NE 156TH AVE PORTLAND, OR 97230
01N17E0000400	SMITH, WILLIAM A. & BARNETT, MARILYN	9058 NW EGRET ST	SEAL ROCK	OR	97376	9058 NW EGRET ST SEAL ROCK, OR 97376-9645
01N17E0000600	SMITH, WILLIAM A. & BARNETT, MARILYN	9058 NW EGRET ST	SEAL ROCK	OR	97376	9058 NW EGRET ST SEAL ROCK, OR 97376-9645
02N17E00007900	SMITH, WILLIAM A. & BARNETT, MARILYN	9058 NW EGRET ST	SEAL ROCK	OR	97376	9058 NW EGRET ST SEAL ROCK, OR 97376-9645
01N17E0000200	MCCOY LAND	1000 VEY WAY APT 363	THE DALLES	OR	97058	1000 VEY WAY APT 363 THE DALLES, OR 97058
02N18E00007800	FALK, KAREN M ETAL	6056 EIGHT MILE ROAD	THE DALLES	OR	97058	6056 EIGHT MILE ROAD THE DALLES, OR 97058
01N17E0000100	HILDERBRAND, JOHN & WANDA	1003 BOYER AV	WALLA WALLA	WA	99362	1003 BOYER AV WALLA WALLA, WA 99362

Map Tax Lot	Owner	Mailing Address	City	State	Zip	Full Mailing Address
01N18E00001600	HILDERBRAND, JOHN O & WANDA F	1003 BOYER AV	WALLA WALLA	WA	99362	1003 BOYER AV WALLA WALLA, WA 99362
02N18E00007900	HILDERBRAND, JOHN O & WANDA F	1003 BOYER AV	WALLA WALLA	WA	99362	1003 BOYER AV WALLA WALLA, WA 99362
01N17E00003300	MCLENNAN, LYNDON	PO BOX 215	WASCO	OR	97065	PO BOX 215 WASCO, OR 97065
01N17E00003500	WEEDMAN RANCHES	PO BOX 386	WASCO	OR	97065	PO BOX 386 WASCO, OR 97065
02N17E00004900	MACNAB, JAMES	68080 PETES ROAD	WASCO	OR	97065	68080 PETES ROAD WASCO, OR 97065
02N17E00005100	GRAY, BRETT L & TRENA D	PO BOX 325	WASCO	OR	97065	PO BOX 325 WASCO, OR 97065
02N17E00005200	FIELDS, JOHN & NANCY	PO BOX 48	WASCO	OR	97065	PO BOX 48 WASCO, OR 97065
02N17E00005300	FIELDS, JOHN & NANCY	PO BOX 48	WASCO	OR	97065	PO BOX 48 WASCO, OR 97065
02N17E00005400	FIELDS, JOHN & NANCY	PO BOX 48	WASCO	OR	97065	PO BOX 48 WASCO, OR 97065
02N17E00005500	FIELDS, JOHN & NANCY	PO BOX 48	WASCO	OR	97065	PO BOX 48 WASCO, OR 97065
02N17E00005600	NWCM OUTDOOR LLC	PO BOX 48	WASCO	OR	97065	PO BOX 48 WASCO, OR 97065
02N17E00005800	FIELDS, JOHN & NANCY	PO BOX 48	WASCO	OR	97065	PO BOX 48 WASCO, OR 97065
02N17E00008000	MCLENNAN, LYNDON P	PO BOX 215	WASCO	OR	97065	PO BOX 215 WASCO, OR 97065
02N17E00008100	GRAY, BRETT L & TRENA D	PO BOX 325	WASCO	OR	97065	PO BOX 325 WASCO, OR 97065
02N17E00008300	GRAY, BRETT L & TRENA D	PO BOX 325	WASCO	OR	97065	PO BOX 325 WASCO, OR 97065
02N18E00004100	MACNAB, GAIL TRUSTEE	PO BOX 276	WASCO	OR	97065	PO BOX 276 WASCO, OR 97065
02N18E00004200	THOMAS, RONALD KENT	PO BOX 7	WASCO	OR	97065	PO BOX 7 WASCO, OR 97065
02N18E00007400	GRAY, BRETT L & TRENA D	PO BOX 325	WASCO	OR	97065	PO BOX 325 WASCO, OR 97065
02N18E00007500	GRAY, BRETT L & TRENA D	PO BOX 325	WASCO	OR	97065	PO BOX 325 WASCO, OR 97065
02N18E00007501	GRAY, BRETT L & TRENA D	PO BOX 325	WASCO	OR	97065	PO BOX 325 WASCO, OR 97065
02N18E00007600	GRAY, BRETT L & TRENA D	PO BOX 325	WASCO	OR	97065	PO BOX 325 WASCO, OR 97065
02N18E00007700	KRAFSIC, LINDA	PO BOX 112	WASCO	OR	97065	PO BOX 112 WASCO, OR 97065
02N18E00008100	WASCO COMMUNITY CHURCH, INC	PO BOX 43	WASCO	OR	97065	PO BOX 43 WASCO, OR 97065

Attachment 3. Electromagnetic Field Study Report

Electromagnetic Frequencies from Transmission Lines

**Biglow Canyon Wind Farm
Request for Amendment 5**

Prepared for



Portland General Electric Company

Prepared by



TETRA TECH

October 2026

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Attachment A. CAFE EMF Output (230-kV Overhead Gen-Tie Line)

Attachment B. CAFE EMF Output (230-kV Overhead Gen-Tie Line with Existing Overhead Transmission Line)

Acronyms and Abbreviations

Acronym/Abbreviation	Definition
μV/m	microvolt per meter
AC	alternating circuit
ACSR	aluminum conductor steel reinforced
BCWF or Facility	Biglow Canyon Wind Farm
BESS	battery energy storage system
BIGL 2 or Project Developer	BIGL 2, LLC
CAFE	Corona and Fields Effect
Certificate Holder / PGE	Portland General Electric Company
Council or EFSC	Energy Facility Siting Council
dB	decibels
EFSC	[Oregon] Energy Facility Siting Council
ELF	extremely low frequency
EMF	electric and magnetic field
EMR	electromagnetic radiation
FCC	Federal Communications Commission
gen-tie	generation tie
GPS	Global Positioning System
GHz	gigahertz
Hz	hertz
KCMIL	kilo circular mils
kHZ	kilohertz
kV	kilovolt
m	meter
mG	milligauss
MHz	megahertz
MW	megawatt
MWh	megawatt-hour
O&M	operations and maintenance
OAR	Oregon Administrative Rules
ODOE	Oregon Department of Energy
PGE	Portland General Electric
PV	photovoltaic
RFA	Request for Amendment
Site Certificate	Site Certificate on Amendment 4
Solar Facility	solar energy generation and battery storage components

1.0 Introduction

The Portland General Electric Company (PGE or Certificate Holder) submits this Request for Amendment (RFA) 5 to the Site Certificate on Amendment 4, issued March 27, 2026 (Site Certificate) for the Biglow Canyon Wind Farm (BCWF or Facility) to add a second phase of solar photovoltaic (PV) energy generation and battery storage capacity to the BCWF following the solar power generation and battery storage capacity approved under RFA 4.

BCWF, owned and operated by PGE, is located within an approved site boundary comprising approximately 25,000 acres, approximately 2.5 miles northeast of the town of Wasco in Sherman County, Oregon (Background Exhibit Figure 1). The BCWF operates under the Site Certificate from the Oregon Energy Facility Siting Council (Council or EFSC) as administered by the Oregon Department of Energy (ODOE). BCWF currently consists of 217 operating wind turbines, with a maximum blade tip height of 445 feet, and a peak generating capacity of 450 megawatts (MW) (Wind Facility). RFA 4, approved March 27, 2026, added 125 MW alternating current (AC) generating capacity from PV solar arrays and 500 megawatt-hours (MWh) in battery storage capacity. The solar energy generation and battery storage components (Solar Facility) described in RFA 4 are currently under construction.

In RFA 5, PGE proposes to add up to 200 MW AC generating capacity from PV solar arrays and 1,000 MWh in battery storage capacity (RFA 5 Solar Facility) by expanding the overall BCWF site boundary by approximately 839 acres. The RFA 5 Solar Facility is located across approximately 622 acres of the existing BCWF site boundary and 839 acres of expanded site boundary, for a total of approximately 1,461 acres (together, RFA 5 Site Boundary; see Background Exhibit Figure 4).

The RFA 5 Site Boundary is approximately 1,461 acres and provides a conservative estimate of the maximum area needed for development and micrositing through final design and construction for the RFA 5 Solar Facility, rather than the anticipated disturbance footprint. Primary infrastructure includes solar arrays, inverters, battery energy storage system (BESS) facilities and their subcomponents (i.e., inverters), one collector substation, and medium voltage collector lines (herein collectively referred to as “Solar Components”). Additionally, the Solar Components include operations and maintenance (O&M) structures, site access roads, internal roads, perimeter fencing, facility entry gates, and temporary laydown areas. The maximum generating capacity from the Solar Components will be 200 MW AC. Power generated from the Solar Components will be transferred to the grid via a 230-kilovolt (kV) generation tie (gen-tie) transmission line, approximately 2.7 miles long. The RFA 5 Solar Facility includes the Solar Components and the gen-tie transmission line.

PGE will own and operate the RFA 5 Solar Facility as a part of the BCWF, which, to date, has been developed by BIGL 2, LLC (BIGL 2, or Project Developer). BIGL 2, in its capacity as the Project Developer, supports PGE in this RFA 5 and may construct and temporarily operate the RFA 5 Solar Facility on behalf of PGE under a Build-Transfer Agreement.

The Specific Standards for Transmission Lines under Oregon Administrative Rule (OAR) 345-024-0090 provide the Certificate Holder must demonstrate it:

(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.

1.1 Electrical and Magnetic Field Background Information

Electrical and magnetic fields (EMFs) occur both naturally and as a result of the generation, transmission, and use of electric power. The earth itself generates steady-state magnetic and electric fields. Electromagnetic fields are present around any conductors or devices that transmit or use electrical energy; as a result, exposure to EMF is common from an array of electrical appliances and equipment, building wiring, and electric distribution and transmission lines. The electrical power system in the United States is an AC system operating at a frequency of 60 hertz (Hz)¹, resulting in “power frequency” or “extremely low frequency (ELF)” EMF.² While electric and magnetic fields are often referred to and thought of collectively, each arises through a different mechanism and can have differing effects.

Electric fields around transmission lines are produced by the presence of an electric charge, measured as voltage, on the energized conductor. Electric field strength is directly proportional to the line’s voltage; that is, increased voltage produces a stronger electric field. The strength of the electric field is inversely proportional to the square of distance from the conductors; the electric field strength declines as the distance from the conductor increases. The strength of the electric field is measured in units of kV per meter (m) or kV/m. Electric fields are readily weakened or blocked by conductive objects such as trees or buildings. The direction of force within the electric field alternates at a frequency of 60 Hz, in direct relation to the charge on each conductor. However, the overall transmission line voltage, and therefore the overall strength and reach of the electric field, remains practically steady and is not affected by the common daily and seasonal fluctuations in usage of electricity by customers.

Magnetic fields around transmission lines are produced by the movement of electrical charge, measured in terms of amperage, through the conductors. Like the electric field, the magnetic field

¹ Hertz is a measure of cycles per second. In a 60-Hz transmission system, the charge and direction of current flow on each conductor will cycle from positive to negative and back to positive 60 times per second. The direction of force in the electric and magnetic fields will also cycle in direct relation to the charge and direction of flow on the conductor.

² The electric transmission system in the U.S. operates at 60 Hz, while in Europe and other parts of the world, the systems operate at 50 Hz; both produce fields that are referred to as power frequency or ELF EMF.

alternates at a frequency of 60 Hz. Magnetic field strength is expressed in units of milligauss (mG).³ The magnetic field strength is directly proportional to the amperage; that is, increased current flow resulting from increased power flow through the line produces a stronger magnetic field. As with electric fields, the magnetic field is inversely proportional to the square of the distance from the conductors, declining in strength as the distance from the conductor increases. Magnetic fields are not blocked or shielded by most materials. Unlike voltage, the amperage and the resulting magnetic field around a transmission line fluctuate daily and seasonally as the usage of electricity varies and the resulting amount of current flow varies.

Each AC three-phase circuit carries power over three conductors. One phase of the circuit is carried by each of the three conductors. The AC voltage and current in each phase conductor is out of sync with the other two phases by 120 degrees, or one-third of the 360-degree cycle. The fields from each of these conductors tend to cancel each other out because of this phase difference. However, since the conductors are separated from each other, when a person stands under a transmission line, one conductor is somewhat closer than the others and will contribute a net uncanceled field at the person's location.

1.2 EMF Standards

Transmission line projects in Oregon must comply with the electric field standard found in OAR 345-024-0090, which requires that the applicant design, construct, and operate the proposed transmission line so that AC electric fields do not exceed 9 kV/m at 1 meter above the ground surface in areas accessible to the public. There is no similar Oregon design standard for magnetic fields.

2.0 Project EMF – OAR 345-024-0090(3)(a)

(3) If the proposed energy facility is a transmission line or has, as a related or supporting facility, a transmission line of any size, the applicant must submit the following:

(a) Information about the expected electric and magnetic fields, including:

2.1 Analysis Area – OAR 345-024-0090(3)(a)(A)(B)(C)

OAR 345-024-0090(3)(a)(A) The distance in feet from the proposed center line of each proposed transmission line to the edge of the right-of-way;

OAR 345-024-0090(3)(a)(B) The type of each occupied structure, including but not limited to residences, commercial establishments, industrial facilities, schools, daycare centers and hospitals, within 200 feet on each side of the proposed center line of each proposed transmission line;

³ Magnetic field strength may also be measured in terms of the Tesla, an International System unit of measurement. 1 Gauss = 0.0001 Tesla, or 1 Tesla = 10,000 Gauss; 1 Gauss = 1,000 mG.

OAR 345-024-0090(3)(a)(C) The approximate distance in feet from the proposed center line to each structure identified in (3);

The distance from the proposed centerline of the overhead transmission line to the edge of the right-of-way is 75 feet on either side.

No permanently occupied buildings are located within 1,000 feet of the proposed centerline of the transmission line.

2.2 Modeling Results – OAR 345-024-0090(3)(a)(D)

OAR 345-024-0090(3)(a)(D) At representative locations along each proposed transmission line, a graph of the predicted electric and magnetic fields levels from the proposed center line to 200 feet on each side of the proposed center line;

Table 1 shows calculated electric field values and Table 2 shows the calculated magnetic field values for the following scenarios:

- Proposed 230-kV overhead gen-tie transmission line; and
- Proposed 230-kV overhead gen-tie transmission line running in parallel to the existing 230-kV overhead line.

Table 1. Calculated Electric Field Values

Line Description	Figure	Electric Field (kV/m)		
		Left (West)	Peak Value	Right (East)
230-kV overhead transmission line	1, 5	0.091 (200 feet left of centerline)	2.981 (12 feet west of centerline)	0.081 (200 feet right of centerline)
230-kV overhead transmission line (next to existing overhead line)	2, 6	0.092 (300 feet left of combined centerline)	2.906 (60 feet east of combined centerline)–	–0.084 (300 feet right of combined centerline)

Table 2. Calculated Magnetic Field Values

Line Description	Figure	Magnetic Field (mG)		
		Left (West)	Peak Value	Right (East)
230-kV overhead transmission line	3, 5	2.76 (200 feet left of centerline)	53.11 (8 feet left of centerline)	2.36 (200 feet right of centerline)
230-kV overhead transmission line (next to existing overhead line)	4, 6	27.81 (300 feet left of combined centerline)	171.18 (60 feet left of combined centerline)	–20.09 (300 feet right of combined centerline)

The analysis results of the Bonneville Power Administration Corona and Fields Effect Program, Version 3 (CAFE) model (BPA n.d.) presented in Table 1 demonstrates that the proposed 230-kV overhead transmission line can be constructed and operated such that the AC electric field would not exceed 9 kV/m at 1 meter above the ground surface, as required by OAR 345-024-0090(1).

Figures 1 and 2 show the electric field graphs and Figures 3 and 4 show the magnetic field graphs for the 230-kV overhead transmission lines. The analysis results for the 230-kV overhead transmission lines are provided in Attachments A and B. The modeling assumptions related to the Facility are intentionally conservative, producing worst-case EMF results. EMF levels under normal operating conditions would be lower than indicated by this analysis.

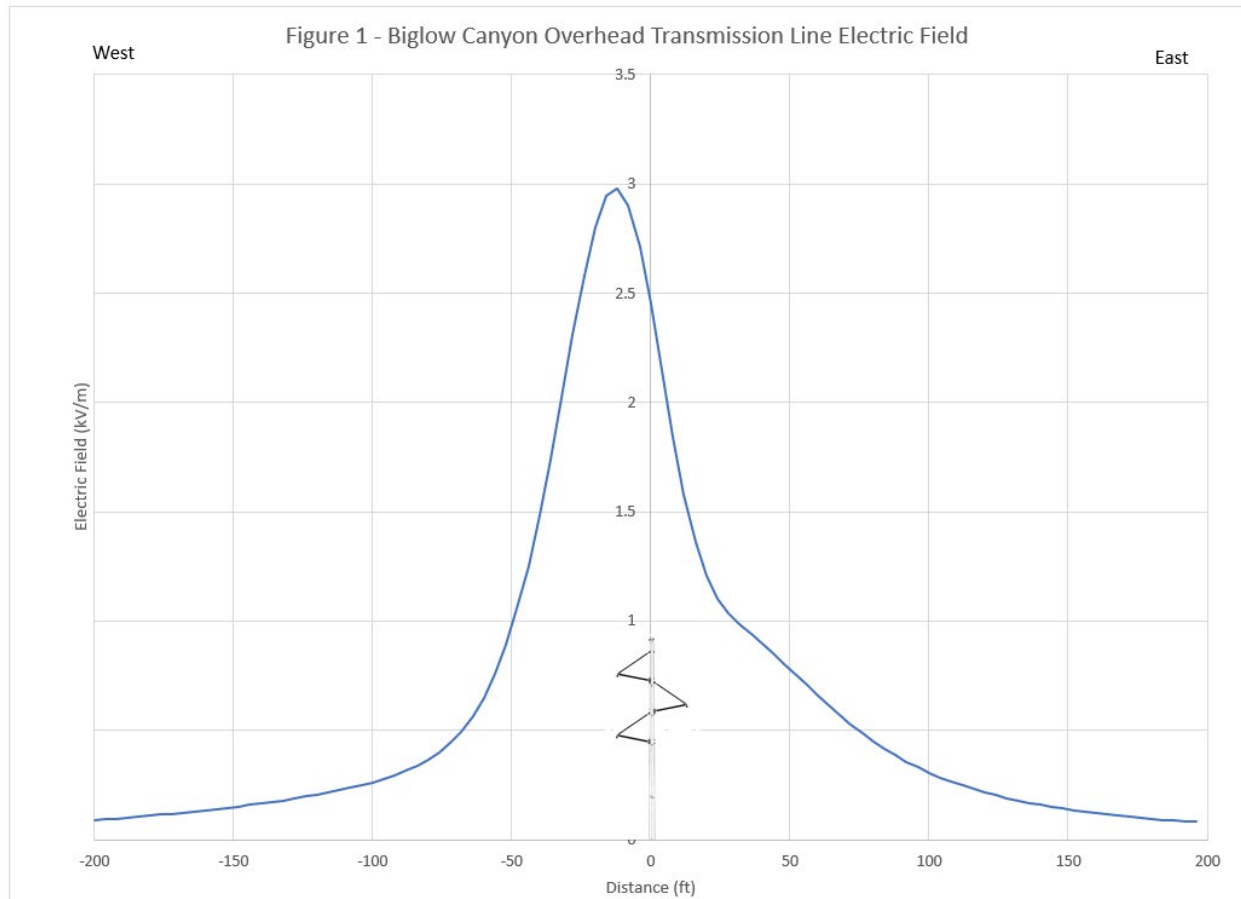


Figure 1. Electric Field, 230-kV Overhead Transmission Line

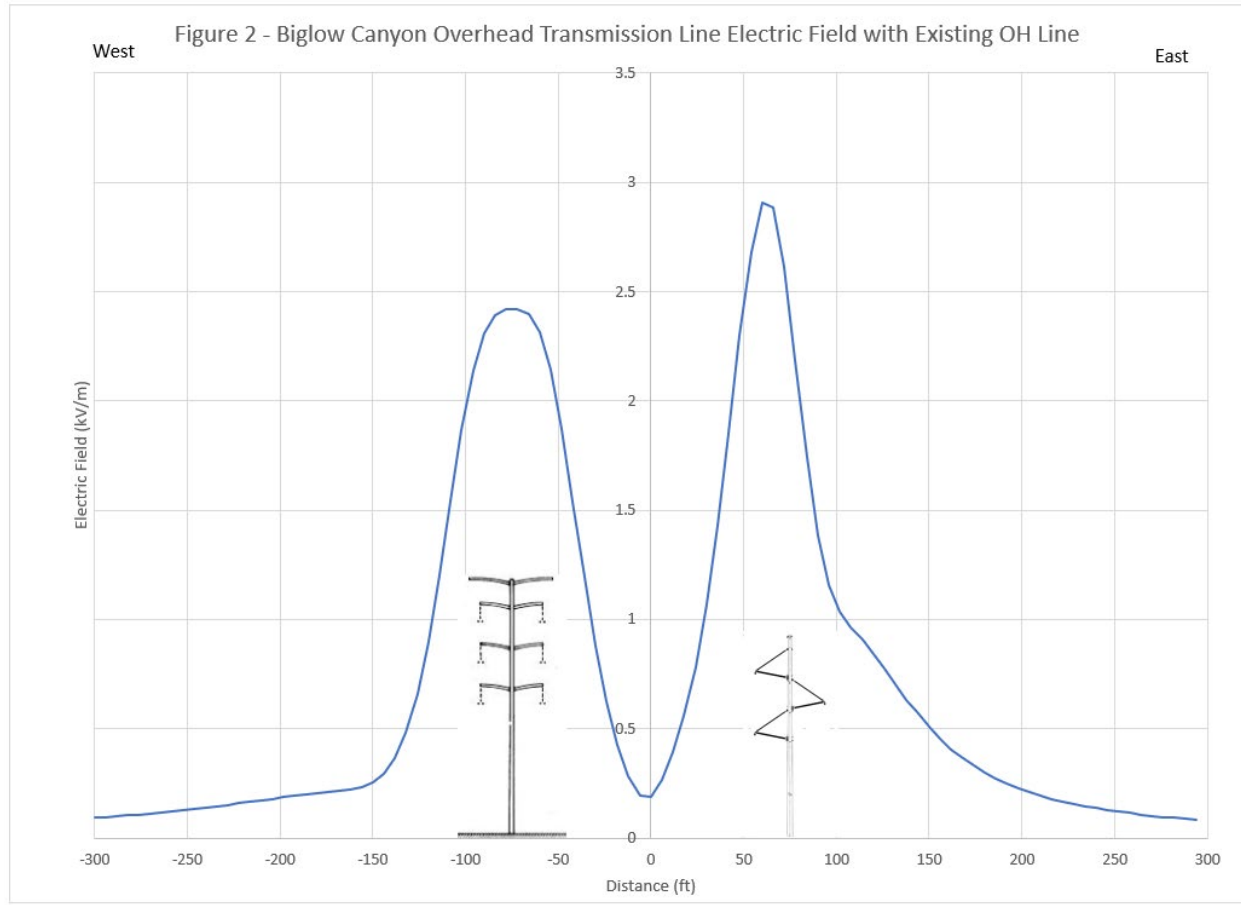


Figure 2. Electric Field, 230-kV Overhead Transmission Line with Existing Line

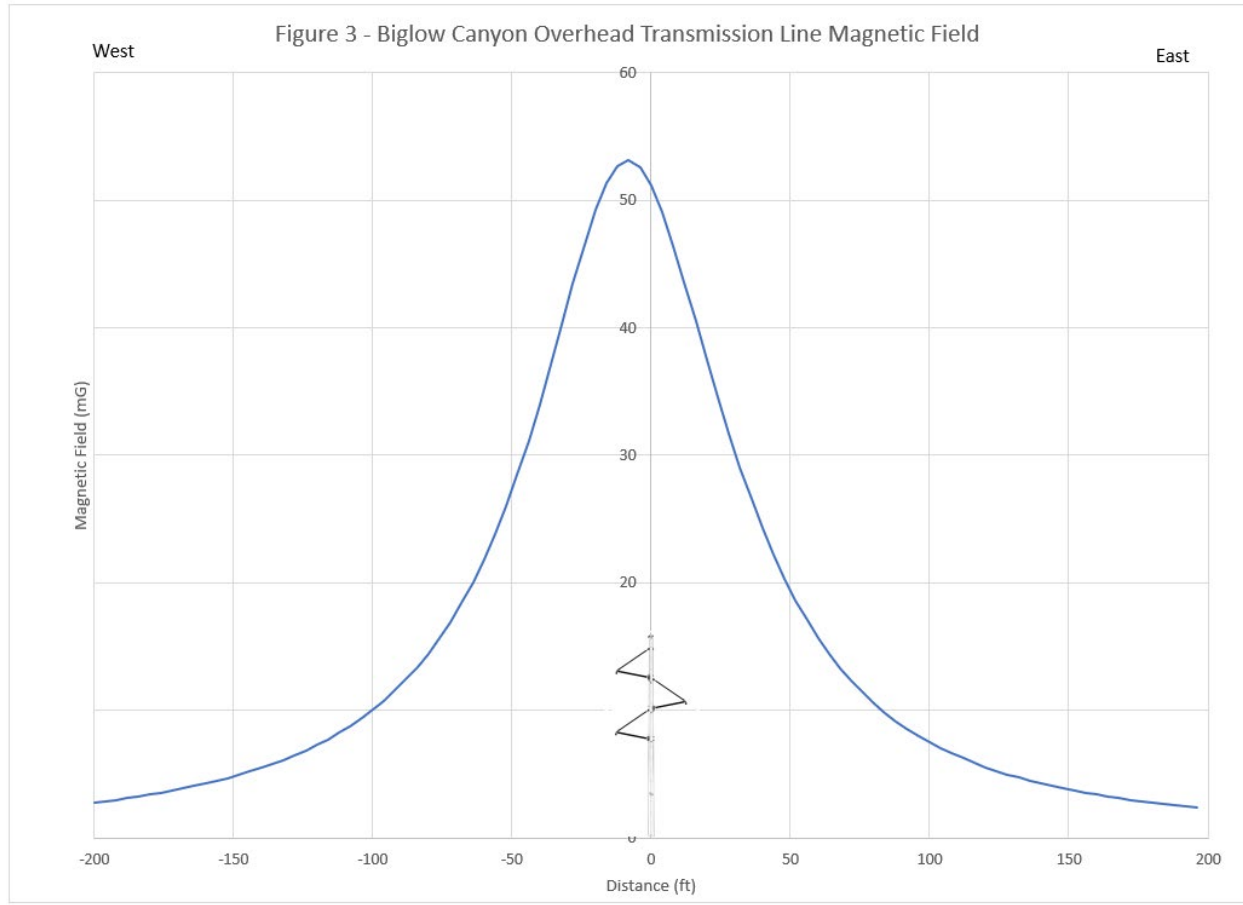


Figure 3. Magnetic Field, 230-kV Overhead Transmission Line

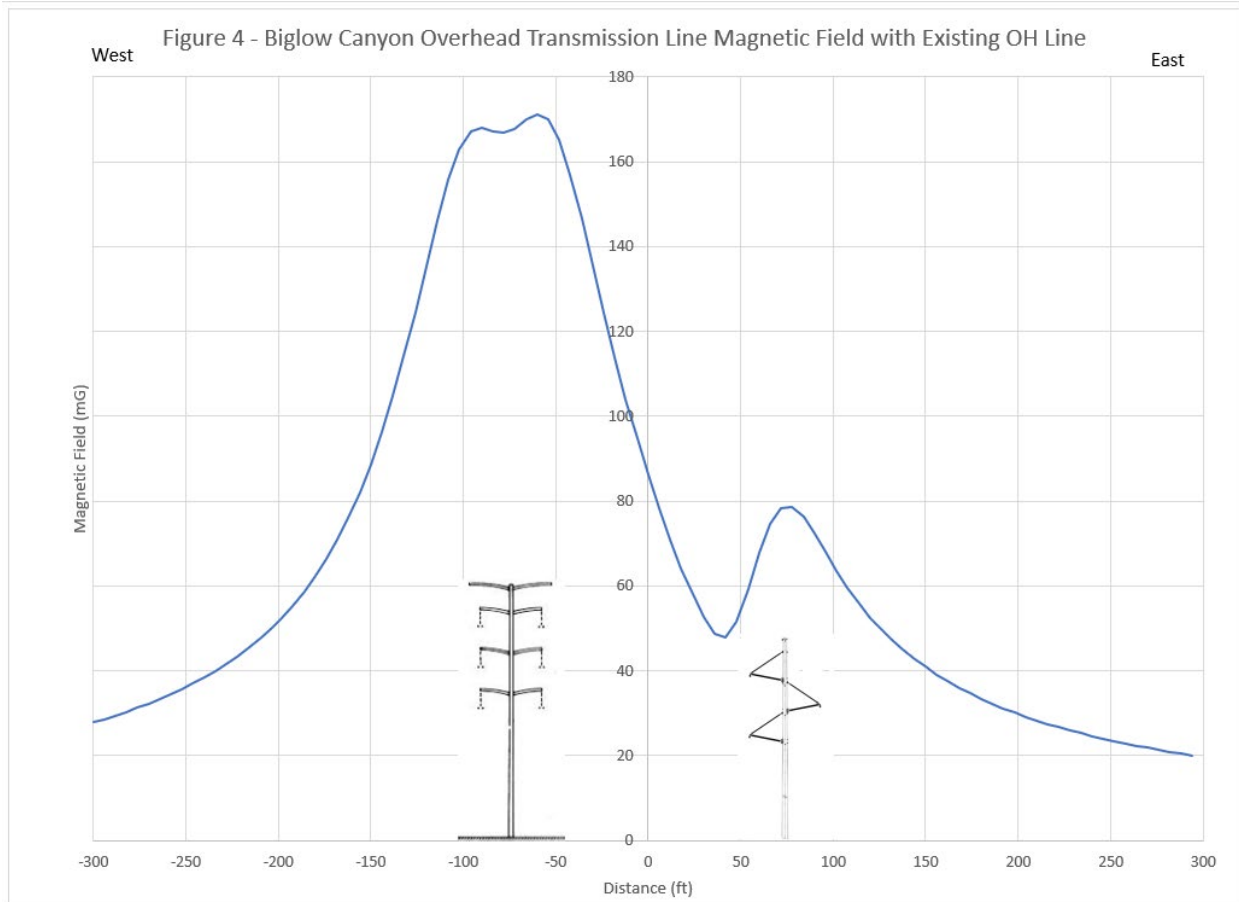


Figure 4. Magnetic Field, 230-kV Overhead Transmission Line with Existing Line

2.3 EMF Calculation Methods – OAR 345-024-0090(3)(a)(F)

OAR 345-024-0090(3)(a)(F) The assumptions and methods used in the electric and magnetic field analysis, including the current in amperes on each proposed transmission line; and

The following assumptions are used for the calculation of the electric and magnetic field analysis of the 230-kV overhead transmission line. The planned 230-kV overhead transmission line configuration is shown in Figure 5. Assumptions for modeling are as follows:

- Environmental parameters – 1 inch of precipitation per hour, 2.0 miles per hour wind speed (for modeling wet-weather conditions).
- Height for both electrical and magnetic field measurements – 1 meter, or 3.28 feet above ground.
- 230-kV overhead transmission line information:
 - Line amperage – 502 amps maximum, as calculated by the maximum load current assuming 200 MW.
 - Line voltage – 230-kV phase/phase or 132.9-kV phase/ground.
 - Conductor type – Dual 1107 kilo circular mils (KCMIL) aluminum conductor steel reinforced (ACSR) “Drake” conductors, 1.108-inch in diameter as shown in Figure 5. Two conductors per phase are used as a bundle, and conductors are separated by 18 inches.
 - Ground wire – one steel ground wire, 0.513 inch in diameter, as shown in Figure 3. Lowest height from ground is estimated at 87 feet 10 inches, and 2 feet right of center (to the east).
 - Phase locations (as shown in Figure 5):
 - A phase (at estimated minimum height to conductor) is located on the lower arm of the transmission structure at 39 feet 7 inches (estimated) and 11 feet left of center (to the west).
 - B phase (at same location as estimated minimum height to conductor) is located on the central arm of the transmission structure at 56 feet 2 inches (estimated) and 11 feet right of center (to the east).
 - C phase (at the same location as estimated minimum height to conductor) is located on the upper arm of the transmission structure at 72 feet 9 inches (estimated) and 11 feet left of center (to the west).
 - Average elevation – 1,420 feet.

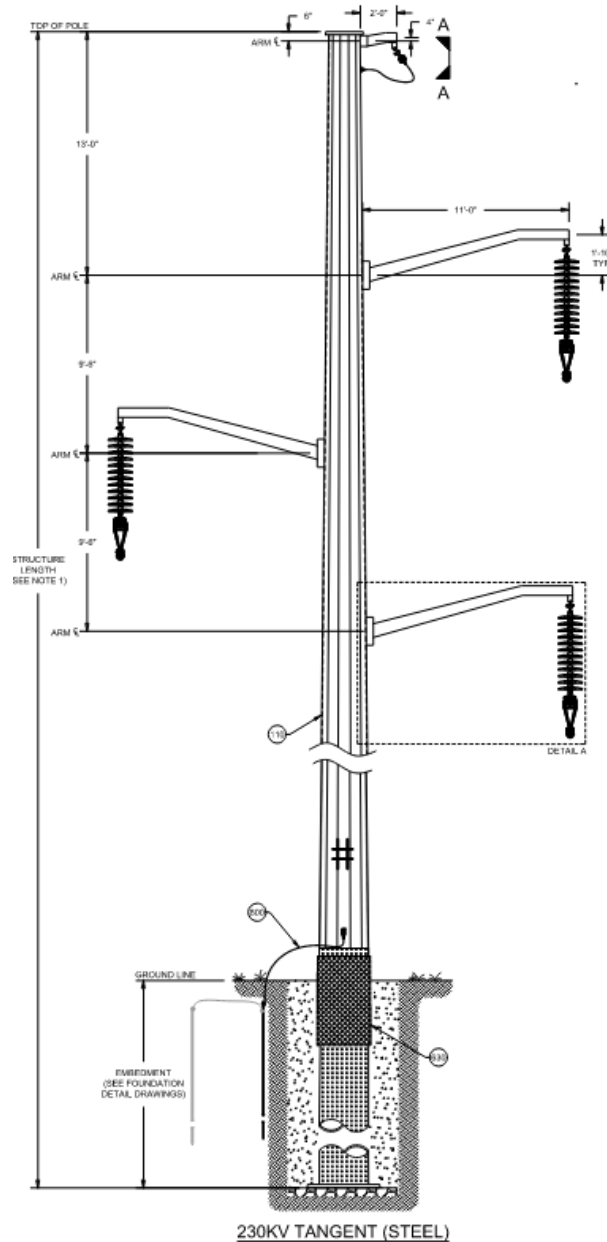


Figure 5. Typical Overhead Transmission Line

Several assumptions were made on the existing 230-kV transmission lines located adjacent to the proposed gen-tie line. Those assumptions follow:

- Presumed two-circuit three-phase overhead transmission line, with an estimated tower height of 115 feet.
- Line amperage – estimated 996 amps, the maximum value for the type of conductor selected.
- Line voltage – 230-kV phase/phase or 132.79 kV phase/ground.
- Conductor type – single 954 Cardinal ACSR per phase, 1.196 inches in diameter.

- Ground wire –one overhead shield wire, 0.5 inch in diameter.
- Line spacing, conductor locations, and minimum heights, ground wire locations and minimum heights – estimated, see Figure 6. Aerial imagery and light detection and ranging survey provided by BIGL was used to estimate centerline location of existing overhead lines and horizontal locations of conductors and ground wires.
- Elevation of the site is estimated at 1,420 feet above sea level.

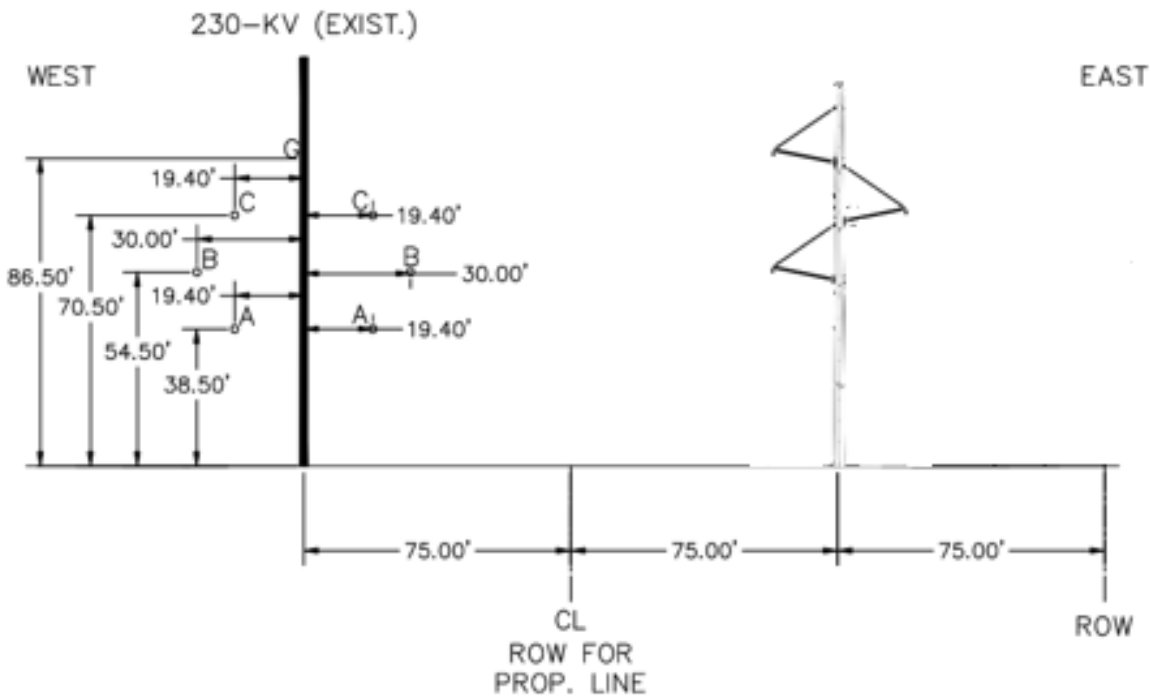


Figure 6. Estimated Layout of Proposed Gen-tie with Existing Overhead Transmission Line

3.0 EMF Mitigation Measures – OAR 345-024-0090(3)(a)(E)

345-024-0090(3)(a)(E) Any measures the applicant proposes to reduce electric or magnetic field levels;

The Certificate Holder will comply with the Specific Facility Conditions identified in Section IV of the Fourth Amended Site Certificate (dated March 27, 2026), specifically the following subsections:

- Subsection J, Siting Standards for Transmission Lines, OAR 345-024-0090:
 - The Certificate Holder shall design the transmission lines so that alternating current electric fields shall not exceed 9 kV per meter at one meter above the ground surface in areas accessible to the public.
 - The Certificate Holder shall design the transmission lines so that induced voltages resulting from the transmission lines are as low as reasonably achievable.

- Subsection T, Public Health and Safety
 - The Certificate Holder shall take reasonable steps to reduce or manage exposure to electromagnetic fields (EMF), consistent with Council findings presented in the “Report of EMF Committee to the Energy Facility Siting Council,” March 30, 1993, and subsequent findings. Effective on the date of this site certificate, the Certificate Holder shall provide information to the public, upon request, about EMF levels associated with the energy facility and related transmission lines.

4.0 EMF Monitoring Program – OAR 345-024-0090(3)(a)(G)

OAR-345-024-0090(3)(a)(G) The applicant’s proposed monitoring program, if any, for actual electric and magnetic field levels.

No program for monitoring actual EMF levels before or after construction is proposed at this time.

5.0 Radio and TV Interference – OAR 345-024-0090(3)(b)

OAR-345-024-0090(3)(b) An evaluation of alternate methods and costs of reducing radio interference likely to be caused by the transmission line in the primary reception area near interstate, U.S. and state highways.

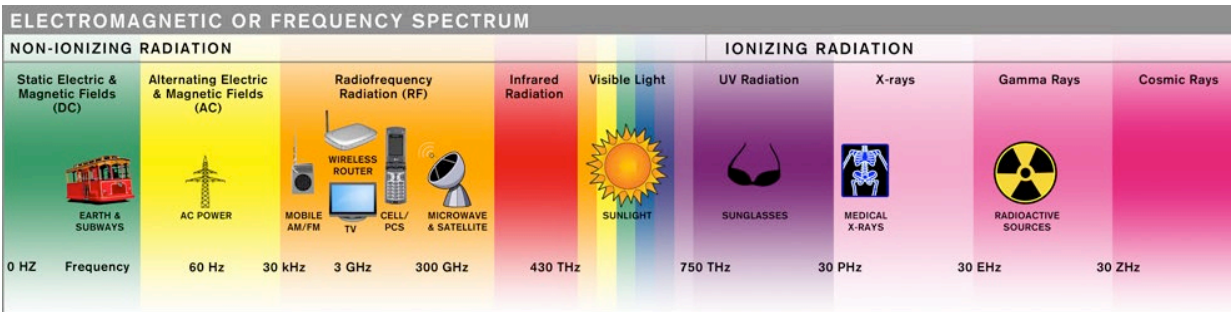
5.1 Background

5.1.1 Electromagnetic Interference

Electromagnetic interference from power transmission systems in the U.S. is governed by the Federal Communications Commission (FCC) Rules and Regulations (FCC 1988). A power transmission line is categorized by the FCC as an “incidental radiation device.” It is defined as “a device that radiates radio frequency energy during the course of its operation although the device is not intentionally designed to generate radio frequency energy.” Such a device “shall be operated so that the radio frequency energy that is emitted does not cause harmful interference. In the event that harmful interference is caused, the operator of the device shall promptly take steps to eliminate the harmful interference.” In this case, “harmful interference” is defined as “any emission, radiation or induction which endangers the functioning of a radio navigation service or of other safety services or seriously degrades, obstructs or repeatedly interrupts a radio communication service operating in accordance with this chapter” (FCC 1988). Oregon does not have regulatory standards for either radio or TV interference.

Modern communications systems all rely on electromagnetic radiation (EMR) to transmit information. AM and FM radio, TV, shortwave radio, cellular telephones, radar, Global Positioning System (GPS) devices and satellite communications, cordless telephones, Bluetooth, and wireless

computer networks such as Wi-Fi or wireless local area networks all utilize a region of the electromagnetic spectrum known as “radio frequency” EMR, which extends from a low-frequency at about 30 kilohertz (kHz) to the high-frequency microwave range at about 300 gigahertz (GHz). Each type of technology uses a specific segment of the electromagnetic frequency spectrum; older technology such as AM radio is at the low-frequency end, while newer technologies such as GPS and Wi-Fi utilize high-frequency signals. Figure 7 provides a visual representation of typical communications frequencies.



Source: EMF & Radio Frequency Solutions. Available at: <http://www.emfrf.com/index.php/emf-rf/emf-overview/electromagnetic-spectrum-or-frequency-spectrum.html>.

Figure 7. Communications Frequency Spectrum

The level of interference can be partially determined by how similar or different the signal frequency is compared to the noise frequency. In general, there is very little interaction between signals of differing frequency; radio signals, TV signals, cellular phone signals, and GPS signals can all coexist in the same space and time without interfering with each other. For interference to occur, frequencies must be similar.

EMR and resulting interference can be an indirect product of electric transmission lines. EMR arises not from the lines themselves, but from the interaction of the strong electric field at the surface of the conductors and other energized components with the surrounding air. Two types of interactions may occur that create electromagnetic interference: corona discharge and gap discharge.

5.1.1.1 Corona Discharge

High-voltage power transmission lines generate a strong electric field at the surface of the conductor, which can be strong enough to split the surrounding air molecules, resulting in the emission of electromagnetic energy in the form of ultraviolet and near-ultraviolet light and broadband radio frequency EMR (corona discharge also produces audible sound; audible sound is not discussed further in this Exhibit). The former can sometimes be seen by humans under the right conditions or with specialized equipment, while the latter can sometimes be heard as electronic “noise,” or interference with radio signal reception. Broadband corona EMR discharge typically occurs in the frequency spectrum from below 100 kHz to approximately 1,000 megahertz (MHz), which overlaps with the frequencies used for AM and FM radio and some TV signals. With sufficient

corona activity, low-frequency radio and TV interference can be noticeable within a few hundred feet of the transmission line. These effects are most pronounced directly underneath the line conductors and decrease with distance from the transmission line.

Corona on a transmission line conductor depends on several factors such as operating voltage, conductor diameter, overall line geometry, weather conditions, and altitude. Conductor size, line voltage and line geometry are taken into consideration when designing a transmission line so that the electric fields at the conductor surface are minimized. However, for a high-voltage line, any incidental irregularities on the conductor surface (for example, water droplets, dust, debris, and nicks or scratches in the conductor) act as points where the electric field may be intensified sufficiently to produce corona. Thus, the level of corona activity is elevated during foul weather when raindrops on the conductor surface act as points producing corona.

5.1.1.2 Gap Discharge

A gap discharge occurs when current arcs across a gap between two conductive objects. Gap discharges can produce radio noise in the lower frequencies (AM radio frequencies) and well into the microwave range (analog TV frequencies). These discharges can be produced by loose connections, a problem that more commonly occurs on low-voltage distribution lines but rarely occurs on high-voltage transmission lines (Trinh 2012). Unlike corona discharge, which may occur anywhere along a high-voltage transmission line conductor, gap discharge occurs at mechanical connectors and components that are used to hold the conductors in place. Gap discharge is controlled through proper construction and maintenance practices to ensure all mechanical connectors and components are properly assembled. Because gap discharge is an intermittent, temporary, and readily resolved problem, and results only in localized electrical interference issues, the potential for interference with TV signals or higher-frequency communications is not considered a significant problem.

5.1.2 Radio Interference Effects

The corona-induced broadband EMR from transmission lines can produce interference to AM signals, such as a commercial AM radio audio signal (i.e., radio noise) or the video portion of an older analog broadcast TV station (i.e., TV noise). Technologies that use frequency modulation, such as FM radio stations and the audio portion of older analog broadcast TV signals, are generally not affected by noise from a transmission line. As digital signal processing has been integrated into these communication systems, the potential interference impact of corona-generated radio noise has decreased.

The level of interference caused by radio noise from a transmission line to the reception of a radio signal depends on the location of the radio transmitter, the radio receiver, and the transmission line. A transmission line that is directly between a radio transmitter and a listener's receiver may be more likely to interfere with that listener's reception, whereas a transmission line behind or beside the listener in relation to the transmitter will not necessarily cause interference, depending on the radio receiver's antennae. The radio noise generated by a transmission line is very low in

power and decreases rapidly as distance from the line increases. It is experienced only when near the transmission line.

In general, complaints related to corona-generated interference are infrequent. Moreover, the advent of cable and satellite TV services, and the federally-mandated conversion to digital TV broadcast in June 2009, have greatly reduced the occurrence of corona-generated interference. Low-frequency corona-induced EMR does not interact with the higher-frequency satellite signals or with wired communication systems, while digital TV receivers are equipped with systems to filter out interference. Many radio stations also broadcast digitally, reducing the likelihood of corona-induced EMR interference. Electric power companies operate very effectively under the present FCC rule because harmful interference can generally be eliminated or effectively mitigated.

Radio noise is measured in units of decibels (dB) based on its field strength referenced to a signal level of 1 microvolt per meter (IEEE 1986). Corona-induced radio noise during fair weather is calculated to be approximately 40 dB (dB-1 microvolt per meter [$1 \mu\text{V/m}$]) at the edge of the right-of-way. This is considered an acceptable level (IEEE 1971). When the transmission line is in proximity to roadways (for example, interstate, U.S., and state highways), such as when it passes over these roadways, radio interference may be experienced for short distances while in proximity to the line. Interference may be more noticeable near the line particularly during foul weather, when corona activity is elevated.

5.1.3 Interference with Other Electronic Communications

Wireless computer network systems, cell phones, GPS units, and satellite receivers operate at high frequencies in the tens to hundreds of MHz or even GHz. These systems also often use FM or digital coding of the signals so they are relatively immune to electromagnetic interference from transmission line corona. GPS units are used in a wide range of activities, including several important agricultural activities such as monitoring pivot irrigation, tracking wheeled and tracked equipment movements during farming operation, and checking the orientation of aerial spraying aircraft. GPS units operate in the frequency range of 1.2 to 1.6 GHz. Satellite receivers operate at frequencies of 3.4 GHz to 7 GHz and have shown no effect from transmission lines unless the receiver was trying to view the satellite through the transmission tower or conductor bundle of the transmission line (Chartier et al. 1986). Repositioning the receiver by a few feet was sufficient to eliminate the obstruction and reduced signal. Mobile phones operate in the radiofrequency range of about 800 MHz to 1,900 MHz or higher. As a result of the high frequencies used by these devices, modulation and processing techniques, and the typically lower-frequency corona-induced EMR, effects from interference are unlikely.

The voltages and currents associated with the transmission line have the potential to induce voltage and current in nearby conductors (e.g., ungrounded metal fences and ungrounded metal irrigation systems). This effect is more likely where ungrounded fences or irrigation systems are parallel and long (1 mile or more). These induced voltages could result in a “nuisance” shock to anyone who touches such a fence or irrigation system. These shocks are known as nuisance or “startle” shocks as they will not physically harm someone but may be noticed by some people and

provoke a startle reaction. An example of an ungrounded metal irrigation system would be a center pivot system on rubber tires. By contrast, the Vermeer-type metal irrigation system is grounded through its metal wheels and therefore presents less of a shock hazard.

A GPS unit in farming equipment should work properly within the vicinity of a transmission line. GPS devices continually pull signals from a number of satellites, not just one, and may also utilize a fixed base station. A signal may be blocked temporarily if the transmission structure is between the receiver and a weak signal, but it will return as the farm equipment moves past the structure. It is also common for GPS receivers to drop and pick up signals even in the absence of transmission lines and structures. If the base station signal is weak or blocked, additional or alternate locations may improve the signal and performance.

Signal interference occurs when other signals at the same frequency as the satellite signal are present. Multipath occurs when objects such as buildings, structures, or tractor parts reflect a GPS satellite signal, causing the satellite signal to arrive at the receiver later than it would have if it followed a straight line from the satellite. A study commissioned by the Electric Power Research Institute found that signal interference is “unlikely” based on the design of GPS receivers and their ability to separate the GPS signal from background noise (Silva and Olsen 2002). Another study compared the accuracy of real-time kinematic GPS receivers at different locations to transmission lines and towers (Gibbings et al. 2001). This study concluded that multipath from transmission towers could result in GPS-initialization errors (e.g., the system reports the wrong starting location) 1.1 percent to 2.3 percent of the time. This study also reported that GPS software was able to identify and correct these initialization errors within the normal startup time. This study reported initialization errors caused by electromagnetic interference from energized overhead transmission lines when the GPS receiver was located outside the vehicle, but concluded that “most, if not all of this effect can be eliminated by shielding the receiver and cables.” Placing the receiver inside the vehicle significantly reduced initialization errors.

5.2 Evaluation of Alternate Methods and Costs to Reduce Interference

Design options for reducing the radio noise from the transmission line include use of larger diameter conductors, or use of more conductors within the conductor bundles. Increasing the distance between phases of the lines (conductor bundles) may also result in a decrease in the radio noise. These line design options have been employed to minimize the generation of radio noise to acceptable levels.

6.0 Conclusion

The Background Information Exhibit demonstrates the Solar Facility will ensure public health and safety with respect to EMFs. Also, this Exhibit demonstrates that the Solar Facility’s AC electric fields and induced currents will comply with the Specific Standards for Transmission Lines under OAR 345-024-0090.

7.0 References

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Attachment A. CAFE EMF Output (230-kV Overhead Gen-Tie Line)

[illegible]

INPUT DATA LIST

7/21/2026

11:45:03

PGE Biglow Solar 230kV RFA5

Analysis 2026/07/21

1,0, 3, 4,0.0, 2.00, 1.00,1420.00

(ENGLISH UNITS OPTION)

(GRADIENTS ARE COMPUTED BY PROGRAM)

PHYSICAL SYSTEM CONSISTS OF 4 CONDUCTORS, OF WHICH 3 ARE ENERGIZED PHASES

OPTIONS: EF,MF,AN

4.921, '230A .000	6.562, , 'A', -11.00,	9.842, 35.58, 2,	1.000, 75.000, 2,	7.000, 1.108,	3.280, 18.000,	6.700, 132.800,	3.280 .000,	.502,
'230B .000	, 'A', 11.00,	56.17, 2,	1.108,	18.000,	132.800,	120.000,	.502,	
'230C .000	, 'A', -11.00,	72.75, 2,	1.108,	18.000,	132.800,	240.000,	.502,	
'G1 .000	, 'A', 2.00,	87.81, 1,	.513,	.000,	.000,	.000,	.000,	

100 -200.0 4.0

1AUDIBLE NOISE CALCULATION - RAIN

DIST FROM REFERENCE (FEET)	TOTALS				
	L5 (DBA)	L50 (DBA)	230A	230B	230C
-200.0	22.2	18.7	14.5	13.9	13.2
-196.0	22.3	18.8	14.6	14.0	13.3
-192.0	22.4	18.9	14.7	14.1	13.4
-188.0	22.5	19.0	14.8	14.2	13.5
-184.0	22.6	19.1	15.0	14.3	13.6
-180.0	22.7	19.2	15.1	14.4	13.7
-176.0	22.8	19.3	15.2	14.5	13.8
-172.0	22.9	19.4	15.3	14.6	13.9
-168.0	23.0	19.5	15.4	14.7	14.0
-164.0	23.1	19.6	15.5	14.8	14.1

-160.0	23.2	19.7	15.7	14.9	14.2
-156.0	23.3	19.8	15.8	15.0	14.3
-152.0	23.5	20.0	15.9	15.1	14.4
-148.0	23.6	20.1	16.1	15.2	14.5
-144.0	23.7	20.2	16.2	15.3	14.7
-140.0	23.8	20.3	16.4	15.4	14.8
-136.0	24.0	20.5	16.5	15.5	14.9
-132.0	24.1	20.6	16.7	15.7	15.0
-128.0	24.2	20.7	16.8	15.8	15.1
-124.0	24.4	20.9	17.0	15.9	15.3
-120.0	24.5	21.0	17.1	16.0	15.4
-116.0	24.7	21.2	17.3	16.2	15.5
-112.0	24.8	21.3	17.5	16.3	15.7
-108.0	25.0	21.5	17.7	16.5	15.8
-104.0	25.1	21.6	17.9	16.6	15.9
-100.0	25.3	21.8	18.0	16.7	16.1
-96.0	25.5	22.0	18.3	16.9	16.2
-92.0	25.7	22.2	18.5	17.0	16.4
-88.0	25.8	22.3	18.7	17.2	16.5
-84.0	26.0	22.5	18.9	17.4	16.7
-80.0	26.2	22.7	19.1	17.5	16.8
-76.0	26.4	22.9	19.4	17.7	17.0
-72.0	26.6	23.1	19.6	17.9	17.1
-68.0	26.8	23.3	19.9	18.0	17.2
-64.0	27.0	23.5	20.2	18.2	17.4
-60.0	27.2	23.7	20.5	18.4	17.5
-56.0	27.5	24.0	20.8	18.6	17.7
-52.0	27.7	24.2	21.1	18.8	17.8
-48.0	27.9	24.4	21.4	19.0	17.9
-44.0	28.2	24.7	21.7	19.1	18.0
-40.0	28.4	24.9	22.0	19.3	18.2
-36.0	28.7	25.2	22.3	19.5	18.3
-32.0	28.9	25.4	22.7	19.7	18.3
-28.0	29.1	25.6	22.9	19.9	18.4
-24.0	29.3	25.8	23.2	20.1	18.5
-20.0	29.5	26.0	23.4	20.3	18.5
-16.0	29.6	26.1	23.5	20.4	18.6
-12.0	29.7	26.2	23.6	20.6	18.6
-8.0	29.7	26.2	23.6	20.7	18.6
-4.0	29.7	26.2	23.5	20.8	18.5
.0	29.6	26.1	23.3	20.9	18.5
4.0	29.5	26.0	23.1	21.0	18.4
8.0	29.4	25.9	22.8	21.0	18.4
12.0	29.2	25.7	22.5	21.0	18.3
16.0	29.0	25.5	22.2	21.0	18.2
20.0	28.9	25.4	21.9	21.0	18.1
24.0	28.7	25.2	21.5	20.9	18.0
28.0	28.5	25.0	21.2	20.8	17.9
32.0	28.3	24.8	20.9	20.7	17.7
36.0	28.1	24.6	20.6	20.5	17.6

40.0	27.8	24.3	20.3	20.4	17.5
44.0	27.6	24.1	20.0	20.2	17.3
48.0	27.4	23.9	19.8	20.0	17.2
52.0	27.2	23.7	19.5	19.8	17.0
56.0	27.0	23.5	19.3	19.6	16.9
60.0	26.8	23.3	19.0	19.4	16.7
64.0	26.6	23.1	18.8	19.2	16.6
68.0	26.4	22.9	18.6	19.0	16.4
72.0	26.2	22.7	18.4	18.9	16.3
76.0	26.1	22.6	18.1	18.7	16.2
80.0	25.9	22.4	17.9	18.5	16.0
84.0	25.7	22.2	17.8	18.3	15.9
88.0	25.5	22.0	17.6	18.1	15.7
92.0	25.4	21.9	17.4	17.9	15.6
96.0	25.2	21.7	17.2	17.8	15.5
100.0	25.0	21.5	17.1	17.6	15.3
104.0	24.9	21.4	16.9	17.4	15.2
108.0	24.7	21.2	16.7	17.3	15.1
112.0	24.6	21.1	16.6	17.1	15.0
116.0	24.4	20.9	16.4	17.0	14.8
120.0	24.3	20.8	16.3	16.8	14.7
124.0	24.2	20.7	16.1	16.7	14.6
128.0	24.0	20.5	16.0	16.5	14.5
132.0	23.9	20.4	15.9	16.4	14.4
136.0	23.8	20.3	15.7	16.2	14.3
140.0	23.6	20.1	15.6	16.1	14.1
144.0	23.5	20.0	15.5	16.0	14.0
148.0	23.4	19.9	15.4	15.8	13.9
152.0	23.3	19.8	15.2	15.7	13.8
156.0	23.2	19.7	15.1	15.6	13.7
160.0	23.0	19.5	15.0	15.5	13.6
164.0	22.9	19.4	14.9	15.4	13.5
168.0	22.8	19.3	14.8	15.2	13.4
172.0	22.7	19.2	14.7	15.1	13.3
176.0	22.6	19.1	14.6	15.0	13.2
180.0	22.5	19.0	14.5	14.9	13.1
184.0	22.4	18.9	14.4	14.8	13.1
188.0	22.3	18.8	14.3	14.7	13.0
192.0	22.2	18.7	14.2	14.6	12.9
196.0	22.1	18.6	14.1	14.5	12.8

1AUDIBLE NOISE CALCULATION - FAIR

DIST FROM REFERENCE (FEET)	TOTALS L5 (DBA)	L50 (DBA)	230A	230B	230C
-200.0	-2.8	-6.3	-10.5	-11.1	-11.8
-196.0	-2.7	-6.2	-10.4	-11.0	-11.7

-192.0	-2.6	-6.1	-10.3	-10.9	-11.6
-188.0	-2.5	-6.0	-10.2	-10.8	-11.5
-184.0	-2.4	-5.9	-10.0	-10.7	-11.4
-180.0	-2.3	-5.8	-9.9	-10.6	-11.3
-176.0	-2.2	-5.7	-9.8	-10.5	-11.2
-172.0	-2.1	-5.6	-9.7	-10.4	-11.1
-168.0	-2.0	-5.5	-9.6	-10.3	-11.0
-164.0	-1.9	-5.4	-9.5	-10.2	-10.9
-160.0	-1.8	-5.3	-9.3	-10.1	-10.8
-156.0	-1.7	-5.2	-9.2	-10.0	-10.7
-152.0	-1.5	-5.0	-9.1	-9.9	-10.6
-148.0	-1.4	-4.9	-8.9	-9.8	-10.5
-144.0	-1.3	-4.8	-8.8	-9.7	-10.3
-140.0	-1.2	-4.7	-8.6	-9.6	-10.2
-136.0	-1.0	-4.5	-8.5	-9.5	-10.1
-132.0	-.9	-4.4	-8.3	-9.3	-10.0
-128.0	-.8	-4.3	-8.2	-9.2	-9.9
-124.0	-.6	-4.1	-8.0	-9.1	-9.7
-120.0	-.5	-4.0	-7.9	-9.0	-9.6
-116.0	-.3	-3.8	-7.7	-8.8	-9.5
-112.0	-.2	-3.7	-7.5	-8.7	-9.3
-108.0	.0	-3.5	-7.3	-8.5	-9.2
-104.0	.1	-3.4	-7.1	-8.4	-9.1
-100.0	.3	-3.2	-7.0	-8.3	-8.9
-96.0	.5	-3.0	-6.7	-8.1	-8.8
-92.0	.7	-2.8	-6.5	-8.0	-8.6
-88.0	.8	-2.7	-6.3	-7.8	-8.5
-84.0	1.0	-2.5	-6.1	-7.6	-8.3
-80.0	1.2	-2.3	-5.9	-7.5	-8.2
-76.0	1.4	-2.1	-5.6	-7.3	-8.0
-72.0	1.6	-1.9	-5.4	-7.1	-7.9
-68.0	1.8	-1.7	-5.1	-7.0	-7.8
-64.0	2.0	-1.5	-4.8	-6.8	-7.6
-60.0	2.2	-1.3	-4.5	-6.6	-7.5
-56.0	2.5	-1.0	-4.2	-6.4	-7.3
-52.0	2.7	-.8	-3.9	-6.2	-7.2
-48.0	2.9	-.6	-3.6	-6.0	-7.1
-44.0	3.2	-.3	-3.3	-5.9	-7.0
-40.0	3.4	-.1	-3.0	-5.7	-6.8
-36.0	3.7	.2	-2.7	-5.5	-6.7
-32.0	3.9	.4	-2.3	-5.3	-6.7
-28.0	4.1	.6	-2.1	-5.1	-6.6
-24.0	4.3	.8	-1.8	-4.9	-6.5
-20.0	4.5	1.0	-1.6	-4.7	-6.5
-16.0	4.6	1.1	-1.5	-4.6	-6.4
-12.0	4.7	1.2	-1.4	-4.4	-6.4
-8.0	4.7	1.2	-1.4	-4.3	-6.4
-4.0	4.7	1.2	-1.5	-4.2	-6.5
.0	4.6	1.1	-1.7	-4.1	-6.5
4.0	4.5	1.0	-1.9	-4.0	-6.6

8.0	4.4	.9	-2.2	-4.0	-6.6
12.0	4.2	.7	-2.5	-4.0	-6.7
16.0	4.0	.5	-2.8	-4.0	-6.8
20.0	3.9	.4	-3.1	-4.0	-6.9
24.0	3.7	.2	-3.5	-4.1	-7.0
28.0	3.5	.0	-3.8	-4.2	-7.1
32.0	3.3	-.2	-4.1	-4.3	-7.3
36.0	3.1	-.4	-4.4	-4.5	-7.4
40.0	2.8	-.7	-4.7	-4.6	-7.5
44.0	2.6	-.9	-5.0	-4.8	-7.7
48.0	2.4	-1.1	-5.2	-5.0	-7.8
52.0	2.2	-1.3	-5.5	-5.2	-8.0
56.0	2.0	-1.5	-5.7	-5.4	-8.1
60.0	1.8	-1.7	-6.0	-5.6	-8.3
64.0	1.6	-1.9	-6.2	-5.8	-8.4
68.0	1.4	-2.1	-6.4	-6.0	-8.6
72.0	1.2	-2.3	-6.6	-6.1	-8.7
76.0	1.1	-2.4	-6.9	-6.3	-8.8
80.0	.9	-2.6	-7.1	-6.5	-9.0
84.0	.7	-2.8	-7.2	-6.7	-9.1
88.0	.5	-3.0	-7.4	-6.9	-9.3
92.0	.4	-3.1	-7.6	-7.1	-9.4
96.0	.2	-3.3	-7.8	-7.2	-9.5
100.0	.0	-3.5	-7.9	-7.4	-9.7
104.0	-.1	-3.6	-8.1	-7.6	-9.8
108.0	-.3	-3.8	-8.3	-7.7	-9.9
112.0	-.4	-3.9	-8.4	-7.9	-10.0
116.0	-.6	-4.1	-8.6	-8.0	-10.2
120.0	-.7	-4.2	-8.7	-8.2	-10.3
124.0	-.8	-4.3	-8.9	-8.3	-10.4
128.0	-1.0	-4.5	-9.0	-8.5	-10.5
132.0	-1.1	-4.6	-9.1	-8.6	-10.6
136.0	-1.2	-4.7	-9.3	-8.8	-10.7
140.0	-1.4	-4.9	-9.4	-8.9	-10.9
144.0	-1.5	-5.0	-9.5	-9.0	-11.0
148.0	-1.6	-5.1	-9.6	-9.2	-11.1
152.0	-1.7	-5.2	-9.8	-9.3	-11.2
156.0	-1.8	-5.3	-9.9	-9.4	-11.3
160.0	-2.0	-5.5	-10.0	-9.5	-11.4
164.0	-2.1	-5.6	-10.1	-9.6	-11.5
168.0	-2.2	-5.7	-10.2	-9.8	-11.6
172.0	-2.3	-5.8	-10.3	-9.9	-11.7
176.0	-2.4	-5.9	-10.4	-10.0	-11.8
180.0	-2.5	-6.0	-10.5	-10.1	-11.9
184.0	-2.6	-6.1	-10.6	-10.2	-11.9
188.0	-2.7	-6.2	-10.7	-10.3	-12.0
192.0	-2.8	-6.3	-10.8	-10.4	-12.1
196.0	-2.9	-6.4	-10.9	-10.5	-12.2

1ELECTRIC FIELD CALCULATIONS

PGE Biglow Solar 230kV RFA5
Analysis 2026/07/21

	DIST. FROM REFERENCE FEET	HEIGHT FEET	MAXIMUM GRADIENT (KV/CM)	SUBCON. DIAM. (IN)	NO. OF SUBCON.	PHASE ANGLE (DEGREES)
230A	-11.00	35.58	10.78	1.11	2	.0
230B	11.00	56.17	10.78	1.11	2	120.0
230C	-11.00	72.75	10.55	1.11	2	240.0
G1	2.00	87.81	4.74	.51	1	.0

SENSOR HT. = 3.3 FEET

DIST FROM REFERENCE THETAX FEET (DEGREES)	E-FIELD SPACE POTENTIAL (KV/METER) (VOLTS)	THETA (DEGREES)	EY-FIELD (KV/METER)	THETAY (DEGREES)	EX-FIELD (KV/METER)
-200.0	.091	88.3	.090	60.8	.003
75.3	90.5				
-196.0	.094	88.3	.094	61.3	.003
76.3	93.9				
-192.0	.097	88.2	.097	61.9	.003
77.3	97.4				
-188.0	.101	88.2	.101	62.5	.003
78.5	101.1				
-184.0	.105	88.2	.105	63.1	.003
79.6	105.0				
-180.0	.109	88.2	.109	63.8	.004
80.9	109.2				
-176.0	.114	88.2	.113	64.5	.004
82.2	113.5				
-172.0	.118	88.1	.118	65.2	.004
83.7	118.1				
-168.0	.123	88.1	.123	66.0	.004
85.2	122.9				
-164.0	.128	88.1	.128	66.8	.005
86.9	127.9				
-160.0	.133	88.1	.133	67.7	.005
88.7	133.3				
-156.0	.139	88.0	.139	68.6	.005
90.7	138.9				
-152.0	.145	88.0	.145	69.6	.005
92.8	144.8				
-148.0	.151	88.0	.151	70.7	.006
95.1	151.1				
-144.0	.158	88.0	.158	71.8	.006
97.6	157.6				

-140.0	.165	88.0	.165	73.1	.007
100.4	164.6				
-136.0	.172	87.9	.172	74.4	.007
103.3	171.9				
-132.0	.180	87.9	.180	75.8	.008
106.6	179.7				
-128.0	.188	87.9	.188	77.4	.008
110.1	187.9				
-124.0	.197	87.9	.197	79.1	.009
113.9	196.5				
-120.0	.206	87.8	.206	81.0	.010
117.9	205.7				
-116.0	.216	87.8	.215	83.0	.011
122.3	215.5				
-112.0	.226	87.8	.226	85.3	.012
126.9	225.9				
-108.0	.237	87.7	.237	87.9	.013
131.6	237.1				
-104.0	.249	87.6	.249	90.7	.015
136.5	249.3				
-100.0	.263	87.5	.263	93.8	.017
141.5	262.6				
-96.0	.278	87.3	.277	97.3	.020
146.4	277.4				
-92.0	.294	87.1	.294	101.2	.023
151.2	294.1				
-88.0	.314	86.9	.313	105.5	.027
155.9	313.5				
-84.0	.337	86.5	.336	110.3	.032
160.2	336.3				
-80.0	.364	86.1	.363	115.5	.038
164.3	363.9				
-76.0	.398	85.5	.397	121.1	.045
168.0	398.0				
-72.0	.441	84.9	.439	127.0	.054
171.4	440.6				
-68.0	.495	84.2	.493	133.0	.066
174.4	494.4				
-64.0	.564	83.6	.560	139.1	.079
177.1	562.6				
-60.0	.650	83.0	.645	145.0	.095
179.5	648.7				
-56.0	.759	82.5	.753	150.6	.114
-178.4	756.6				
-52.0	.893	82.2	.885	155.8	.136
-176.6	890.1				
-48.0	1.058	82.0	1.047	160.5	.161
-174.9	1052.8				
-44.0	1.254	82.1	1.242	164.7	.186
-173.4	1247.3				

-40.0	1.482	82.3	1.469	168.3	.211
-171.8	1474.1				
-36.0	1.741	82.7	1.727	171.5	.232
-170.2	1730.3				
-32.0	2.021	83.4	2.008	174.3	.244
-168.1	2007.9				
-28.0	2.308	84.3	2.297	176.7	.241
-165.2	2291.6				
-24.0	2.578	85.5	2.570	178.9	.218
-160.4	2558.1				
-20.0	2.801	86.9	2.797	-179.1	.172
-150.7	2777.4				
-16.0	2.944	88.5	2.943	-177.0	.117
-126.5	2917.4				
-12.0	2.981	90.4	2.981	-174.7	.105
-74.7	2952.7				
-8.0	2.901	92.2	2.899	-172.0	.165
-39.5	2873.0				
-4.0	2.715	94.0	2.709	-168.7	.237
-26.0	2688.1				
.0	2.451	95.5	2.440	-164.4	.289
-19.7	2426.6				
4.0	2.148	96.7	2.133	-158.8	.314
-16.0	2127.1				
8.0	1.845	97.4	1.830	-151.7	.312
-13.2	1829.4				
12.0	1.576	97.3	1.563	-142.8	.290
-10.5	1565.4				
16.0	1.361	96.4	1.352	-132.5	.256
-7.4	1354.6				
20.0	1.205	94.9	1.201	-121.5	.216
-3.6	1201.9				
24.0	1.102	93.5	1.100	-110.6	.178
1.4	1098.9				
28.0	1.033	92.6	1.032	-100.8	.143
7.8	1030.0				
32.0	.983	92.1	.982	-92.4	.114
16.1	979.6				
36.0	.940	92.1	.939	-85.5	.092
26.1	936.4				
40.0	.897	92.2	.896	-79.8	.076
37.6	893.9				
44.0	.852	92.5	.852	-75.0	.065
49.6	849.6				
48.0	.805	92.8	.804	-71.0	.058
60.9	803.1				
52.0	.757	93.0	.756	-67.6	.053
70.8	754.9				
56.0	.708	93.2	.707	-64.6	.049
79.1	706.3				

60.0	.659	93.4	.658	-61.8	.046
85.9	658.2				
64.0	.613	93.5	.611	-59.4	.043
91.4	611.5				
68.0	.568	93.6	.567	-57.1	.040
96.0	566.9				
72.0	.526	93.6	.524	-55.0	.037
99.9	524.8				
76.0	.486	93.7	.485	-52.9	.034
103.2	485.4				
80.0	.449	93.7	.449	-51.0	.031
106.0	448.9				
84.0	.416	93.7	.415	-49.2	.029
108.6	415.3				
88.0	.385	93.6	.384	-47.4	.026
110.9	384.3				
92.0	.356	93.6	.356	-45.7	.024
113.0	356.0				
96.0	.330	93.5	.330	-44.0	.022
114.9	330.2				
100.0	.307	93.5	.306	-42.4	.020
116.7	306.6				
104.0	.285	93.4	.285	-40.8	.018
118.4	285.0				
108.0	.266	93.3	.265	-39.3	.016
120.0	265.4				
112.0	.248	93.2	.247	-37.8	.015
121.6	247.6				
116.0	.231	93.2	.231	-36.3	.014
123.1	231.3				
120.0	.217	93.1	.216	-34.9	.012
124.5	216.4				
124.0	.203	93.0	.203	-33.5	.011
125.9	202.8				
128.0	.190	92.9	.190	-32.1	.010
127.2	190.4				
132.0	.179	92.9	.179	-30.8	.010
128.6	179.0				
136.0	.169	92.8	.168	-29.5	.009
129.8	168.6				
140.0	.159	92.7	.159	-28.2	.008
131.1	159.0				
144.0	.150	92.6	.150	-27.0	.007
132.3	150.2				
148.0	.142	92.6	.142	-25.8	.007
133.6	142.1				
152.0	.135	92.5	.135	-24.7	.006
134.7	134.6				
156.0	.128	92.4	.128	-23.5	.006
135.9	127.7				

160.0	.121	92.4	.121	-22.4	.005
137.1	121.3				
164.0	.115	92.3	.115	-21.4	.005
138.2	115.4				
168.0	.110	92.3	.110	-20.3	.005
139.3	109.9				
172.0	.105	92.2	.105	-19.3	.004
140.4	104.7				
176.0	.100	92.2	.100	-18.3	.004
141.4	100.0				
180.0	.096	92.1	.096	-17.4	.004
142.5	95.5				
184.0	.091	92.1	.091	-16.4	.003
143.5	91.4				
188.0	.088	92.0	.087	-15.5	.003
144.5	87.5				
192.0	.084	92.0	.084	-14.7	.003
145.5	83.9				
196.0	.081	91.9	.080	-13.8	.003
146.5	80.5				

1MAGNETIC FIELD CALCULATIONS

SENSOR HT. = 3.3 FEET

DIST FROM REFERENCE FEET	B-FIELD (GAUSS)	THETA	BY-FIELD (GAUSS)	THETAY	BX-FIELD (GAUSS)	THETAX
-200.0	.00275875	-146.4	.00199765	163.2	.00245252	223.8
-196.0	.00287033	-145.8	.00208876	163.9	.00253942	224.2
-192.0	.00298863	-145.2	.00218625	164.7	.00263051	224.5
-188.0	.00311420	-144.5	.00229070	165.4	.00272603	224.9
-184.0	.00324763	-143.8	.00240277	166.2	.00282620	225.2
-180.0	.00338955	-143.1	.00252320	167.0	.00293126	225.6
-176.0	.00354069	-142.3	.00265281	167.8	.00304146	226.0
-172.0	.00370184	-141.5	.00279251	168.6	.00315705	226.4
-168.0	.00387386	-140.7	.00294332	169.5	.00327827	226.9
-164.0	.00405773	-139.8	.00310640	170.3	.00340538	227.3
-160.0	.00425450	-138.9	.00328303	171.2	.00353860	227.8
-156.0	.00446537	-137.9	.00347466	172.1	.00367816	228.4
-152.0	.00469167	-136.9	.00368293	173.0	.00382426	228.9
-148.0	.00493486	-135.9	.00390967	174.0	.00397707	229.5
-144.0	.00519659	-134.8	.00415695	174.9	.00413671	230.2
-140.0	.00547870	-133.6	.00442710	175.9	.00430322	230.9
-136.0	.00578324	-132.4	.00472276	176.9	.00447660	231.6
-132.0	.00611253	-131.1	.00504691	177.9	.00465670	232.4
-128.0	.00646916	-129.7	.00540290	178.9	.00484325	233.3
-124.0	.00685606	-128.2	.00579450	180.0	.00503583	234.2

-120.0	.00727651	-126.7	.00622598	181.0	.00523379	235.3
-116.0	.00773424	-125.1	.00670211	182.1	.00543623	236.4
-112.0	.00823345	-123.3	.00722826	183.2	.00564199	237.7
-108.0	.00877888	-121.5	.00781038	184.3	.00584957	239.2
-104.0	.00937593	-119.5	.00845509	185.3	.00605715	240.9
-100.0	.01003071	-117.4	.00916965	186.4	.00626265	242.7
-96.0	.01075012	-115.2	.00996190	187.5	.00646381	244.9
-92.0	.01154202	-112.8	.01084022	188.6	.00665856	247.4
-88.0	.01241529	-110.2	.01181331	189.7	.00684558	250.4
-84.0	.01337998	-107.5	.01288980	190.8	.00702549	254.0
-80.0	.01444738	-104.5	.01407774	191.9	.00720283	258.2
-76.0	.01563020	-101.4	.01538367	193.0	.00738949	263.4
-72.0	.01694253	-97.9	.01681128	194.1	.00761007	269.6
-68.0	.01839988	-94.2	.01835937	195.1	.00790950	-82.9
-64.0	.02001900	-90.2	.02001892	196.2	.00836168	-74.1
-60.0	.02181746	-85.8	.02176889	197.4	.00907507	-64.2
-56.0	.02381282	-81.1	.02357043	198.5	.01018810	-53.8
-52.0	.02602123	-75.9	.02535929	199.8	.01185104	-43.5
-48.0	.02845488	-70.2	.02703636	201.2	.01420110	-34.1
-44.0	.03111815	-64.0	.02845752	202.8	.01734194	-26.0
-40.0	.03400160	-57.2	.02942590	204.8	.02132718	-19.2
-36.0	.03707351	-49.8	.02969413	207.5	.02613607	-13.8
-32.0	.04026921	-41.7	.02899281	211.2	.03163266	-9.4
-28.0	.04347968	-32.9	.02711562	216.9	.03751206	-5.8
-24.0	.04654429	-23.3	.02411963	226.2	.04325594	-2.9
-20.0	.04925482	-13.1	.02073917	241.9	.04813979	-.3
-16.0	.05137957	-2.3	.01893404	266.6	.05134230	2.2
-12.0	.05270872	8.8	.02096729	-65.9	.05217002	4.7
-8.0	.05310816	20.2	.02631397	-46.0	.05032328	7.7
-4.0	.05255672	31.5	.03252413	-34.1	.04605693	11.6
.0	.05114632	42.6	.03775827	-26.9	.04013066	16.9
4.0	.04904733	53.2	.04114301	-22.1	.03358701	24.2
8.0	.04646033	63.4	.04249592	-18.5	.02749188	34.5
12.0	.04357629	72.9	.04205092	-15.5	.02271996	48.1
16.0	.04055484	81.8	.04023588	-12.6	.01974163	64.3
20.0	.03751822	90.2	.03751812	-9.8	.01842766	80.5
24.0	.03455405	97.8	.03431582	-6.7	.01816425	94.3
28.0	.03172150	104.9	.03095905	-3.4	.01829236	105.1
32.0	.02905763	111.4	.02768204	.3	.01839297	113.2
36.0	.02658288	117.4	.02463243	4.1	.01828601	119.5
40.0	.02430547	122.8	.02188812	8.3	.01793562	124.5
44.0	.02222483	127.7	.01947584	12.6	.01737330	128.6
48.0	.02033435	132.1	.01738830	17.0	.01665377	132.1
52.0	.01862357	136.1	.01559828	21.4	.01583310	135.2
56.0	.01707972	139.6	.01406916	25.7	.01495954	138.0
60.0	.01568902	142.7	.01276209	29.9	.01407070	140.6
64.0	.01443745	145.5	.01164035	33.9	.01319383	142.9
68.0	.01331139	148.0	.01067152	37.7	.01234744	145.2
72.0	.01229795	150.1	.00982828	41.3	.01154307	147.3
76.0	.01138518	152.0	.00908826	44.6	.01078716	149.4

80.0	.01056216	153.7	.00843354	47.7	.01008241	151.3
84.0	.00981904	155.1	.00784986	50.5	.00942903	153.1
88.0	.00914696	156.3	.00732594	53.2	.00882558	154.9
92.0	.00853805	157.4	.00685284	55.6	.00826961	156.6
96.0	.00798532	158.3	.00642343	57.9	.00775810	158.2
100.0	.00748258	159.0	.00603194	59.9	.00728780	159.8
104.0	.00702436	159.7	.00567371	61.9	.00685540	161.3
108.0	.00660586	160.3	.00534485	63.7	.00645767	162.7
112.0	.00622282	160.8	.00504213	65.3	.00609156	164.0
116.0	.00587150	161.2	.00476281	66.9	.00575421	165.3
120.0	.00554862	161.6	.00450455	68.4	.00544298	166.6
124.0	.00525128	161.9	.00426532	69.7	.00515548	167.7
128.0	.00497690	162.3	.00404334	71.0	.00488952	168.9
132.0	.00472324	162.5	.00383705	72.2	.00464312	169.9
136.0	.00448828	162.8	.00364508	73.4	.00441451	171.0
140.0	.00427025	163.1	.00346619	74.5	.00420208	171.9
144.0	.00406759	163.3	.00329928	75.5	.00400440	172.9
148.0	.00387890	163.5	.00314337	76.5	.00382016	173.8
152.0	.00370292	163.7	.00299756	77.4	.00364821	174.6
156.0	.00353856	164.0	.00286105	78.3	.00348749	175.5
160.0	.00338481	164.2	.00273310	79.1	.00333707	176.2
164.0	.00324078	164.4	.00261306	79.9	.00319609	177.0
168.0	.00310568	164.6	.00250032	80.7	.00306380	177.7
172.0	.00297878	164.8	.00239434	81.4	.00293949	178.4
176.0	.00285944	165.0	.00229461	82.1	.00282255	179.1
180.0	.00274707	165.2	.00220067	82.8	.00271241	179.7
184.0	.00264114	165.4	.00211212	83.5	.00260854	180.3
188.0	.00254117	165.6	.00202856	84.1	.00251050	180.9
192.0	.00244672	165.8	.00194965	84.7	.00241785	181.5
196.0	.00235740	166.0	.00187505	85.3	.00233020	182.0

**Attachment B. CAFE EMF Output (230-kV
Overhead Gen-Tie Line with Existing
Overhead Transmission Line)**

[illegible]

INPUT DATA LIST

7/23/2026

15:49:19

PGE Biglow Solar 230kV RFA5

Analysis 2026/07/23 w/ exist 230kV

1,0, 9,11,0.0, 2.00, 1.00,1420.00

(ENGLISH UNITS OPTION)

(GRADIENTS ARE COMPUTED BY PROGRAM)

PHYSICAL SYSTEM CONSISTS OF 11 CONDUCTORS, OF WHICH 9 ARE ENERGIZED PHASES

OPTIONS: EF,MF,AN

4.921,	6.562,	9.842,	1.000,	75.000,	7.000,	3.280,	6.700,	3.280		
'230A	','A',	64.00,	35.58,	2,	1.108,	18.000,	132.800,	.000,	.502,	.000
'230B	','A',	86.00,	56.17,	2,	1.108,	18.000,	132.800,	120.000,	.502,	.000
'230C	','A',	64.00,	72.75,	2,	1.108,	18.000,	132.800,	240.000,	.502,	.000
'G1	','A',	77.00,	87.81,	1,	.513,	.000,	.000,	.000,	.000,	.000
'E230A1	','A',	-94.40,	38.50,	1,	1.196,	.000,	132.790,	.000,	.996,	.000
'E230A2	','A',	-55.60,	38.50,	1,	1.196,	.000,	132.790,	.000,	.996,	.000
'E230B1	','A',	-105.00,	54.50,	1,	1.196,	.000,	132.790,	120.000,	.996,	.000
'E230B2	','A',	-45.00,	54.50,	1,	1.196,	.000,	132.790,	120.000,	.996,	.000
'E230C1	','A',	-94.40,	70.50,	1,	1.196,	.000,	132.790,	-120.000,	.996,	.000
'E230C2	','A',	-55.60,	70.50,	1,	1.196,	.000,	132.790,	-120.000,	.996,	.000
'E230G	','A',	-75.00,	86.50,	1,	.500,	.000,	.000,	.000,	.000,	.000

100 -300.0 6.0
1AUDIBLE NOISE CALCULATION - RAIN

DIST FROM REFERENCE E230B2 (FEET)	TOTALS L5 E230C1 (DBA)	L50 (DBA)	230A	230B	230C	G1	E230A1	E230A2	E230B1
-300.0 32.4	41.6 27.9	38.1	11.6	10.9	9.8	-46.6	30.1	29.2	33.3
-294.0 32.6	41.7 28.0	38.2	11.7	11.0	9.9	-46.5	30.2	29.4	33.5
-288.0 32.7	41.8 28.2	38.3	11.8	11.1	10.0	-46.5	30.4	29.5	33.6

-282.0	42.0	38.5	11.9	11.1	10.1	-46.4	30.5	29.6	33.8
32.8	28.3								
-276.0	42.1	38.6	11.9	11.2	10.1	-46.3	30.7	29.7	33.9
32.9	28.5								
-270.0	42.3	38.8	12.0	11.3	10.2	-46.2	30.9	29.9	34.1
33.0	28.6								
-264.0	42.4	38.9	12.1	11.4	10.3	-46.2	31.0	30.0	34.3
33.2	28.8								
-258.0	42.6	39.1	12.2	11.5	10.4	-46.1	31.2	30.1	34.4
33.3	28.9								
-252.0	42.7	39.2	12.3	11.6	10.5	-46.0	31.4	30.3	34.6
33.4	29.1								
-246.0	42.9	39.4	12.4	11.6	10.6	-45.9	31.6	30.4	34.8
33.6	29.2								
-240.0	43.1	39.6	12.5	11.7	10.7	-45.8	31.7	30.6	35.0
33.7	29.4								
-234.0	43.2	39.7	12.6	11.8	10.8	-45.7	31.9	30.8	35.2
33.9	29.6								
-228.0	43.4	39.9	12.7	11.9	10.9	-45.6	32.2	30.9	35.4
34.0	29.7								
-222.0	43.6	40.1	12.8	12.0	11.0	-45.5	32.4	31.1	35.6
34.2	29.9								
-216.0	43.8	40.3	12.9	12.1	11.1	-45.4	32.6	31.3	35.8
34.3	30.1								
-210.0	44.0	40.5	13.0	12.2	11.2	-45.4	32.8	31.4	36.0
34.5	30.3								
-204.0	44.2	40.7	13.1	12.3	11.3	-45.3	33.1	31.6	36.3
34.6	30.5								
-198.0	44.4	40.9	13.2	12.4	11.4	-45.2	33.3	31.8	36.5
34.8	30.7								
-192.0	44.7	41.2	13.3	12.5	11.5	-45.1	33.6	32.0	36.8
35.0	30.9								
-186.0	44.9	41.4	13.4	12.6	11.6	-45.0	33.9	32.2	37.0
35.2	31.1								
-180.0	45.1	41.6	13.6	12.7	11.7	-44.9	34.2	32.4	37.3
35.4	31.3								
-174.0	45.4	41.9	13.7	12.8	11.8	-44.7	34.5	32.7	37.6
35.6	31.6								
-168.0	45.7	42.2	13.8	12.9	11.9	-44.6	34.8	32.9	37.9
35.8	31.8								
-162.0	45.9	42.4	13.9	13.0	12.1	-44.5	35.1	33.2	38.2
36.0	32.0								
-156.0	46.2	42.7	14.1	13.2	12.2	-44.4	35.5	33.4	38.5
36.2	32.2								
-150.0	46.5	43.0	14.2	13.3	12.3	-44.3	35.9	33.7	38.8
36.4	32.5								
-144.0	46.8	43.3	14.3	13.4	12.4	-44.2	36.3	34.0	39.1
36.7	32.7								
-138.0	47.1	43.6	14.5	13.5	12.6	-44.1	36.7	34.3	39.4
36.9	32.9								

-132.0	47.4	43.9	14.6	13.6	12.7	-43.9	37.1	34.6	39.6
37.2	33.1								
-126.0	47.7	44.2	14.8	13.8	12.8	-43.8	37.6	34.9	39.9
37.4	33.3								
-120.0	48.0	44.5	14.9	13.9	13.0	-43.7	38.0	35.3	40.0
37.7	33.5								
-114.0	48.2	44.7	15.1	14.0	13.1	-43.6	38.4	35.7	40.2
38.0	33.6								
-108.0	48.5	45.0	15.3	14.2	13.3	-43.4	38.8	36.1	40.3
38.3	33.7								
-102.0	48.6	45.1	15.4	14.3	13.4	-43.3	39.0	36.5	40.3
38.6	33.8								
-96.0	48.8	45.3	15.6	14.5	13.6	-43.2	39.1	36.9	40.2
38.9	33.8								
-90.0	48.9	45.4	15.8	14.6	13.7	-43.0	39.1	37.3	40.0
39.2	33.8								
-84.0	48.9	45.4	16.0	14.8	13.9	-42.9	38.9	37.8	39.9
39.5	33.7								
-78.0	48.9	45.4	16.2	15.0	14.1	-42.7	38.6	38.2	39.6
39.7	33.7								
-72.0	48.9	45.4	16.4	15.1	14.2	-42.6	38.2	38.6	39.4
40.0	33.5								
-66.0	48.9	45.4	16.6	15.3	14.4	-42.4	37.8	38.9	39.1
40.2	33.4								
-60.0	48.9	45.4	16.8	15.5	14.6	-42.3	37.4	39.1	38.8
40.4	33.2								
-54.0	48.8	45.3	17.0	15.7	14.8	-42.1	36.9	39.1	38.5
40.6	33.0								
-48.0	48.6	45.1	17.3	15.9	15.0	-41.9	36.5	39.0	38.2
40.6	32.8								
-42.0	48.4	44.9	17.5	16.0	15.2	-41.8	36.1	38.7	37.9
40.6	32.6								
-36.0	48.2	44.7	17.8	16.3	15.4	-41.6	35.7	38.4	37.6
40.6	32.4								
-30.0	48.0	44.5	18.1	16.5	15.6	-41.4	35.3	38.0	37.3
40.4	32.1								
-24.0	47.7	44.2	18.4	16.7	15.8	-41.3	35.0	37.5	37.0
40.2	31.9								
-18.0	47.4	43.9	18.7	16.9	16.0	-41.1	34.6	37.1	36.8
40.0	31.7								
-12.0	47.1	43.6	19.0	17.1	16.2	-40.9	34.3	36.7	36.5
39.7	31.5								
-6.0	46.8	43.3	19.3	17.4	16.4	-40.7	34.0	36.2	36.3
39.5	31.2								
.0	46.5	43.0	19.7	17.6	16.6	-40.5	33.7	35.8	36.0
39.2	31.0								
6.0	46.2	42.7	20.1	17.9	16.9	-40.4	33.5	35.5	35.8
38.9	30.8								
12.0	45.9	42.4	20.5	18.2	17.1	-40.2	33.2	35.1	35.6
38.6	30.6								

18.0	45.7	42.2	21.0	18.4	17.3	-40.0	32.9	34.8	35.4
38.3	30.4								
24.0	45.4	41.9	21.4	18.7	17.5	-39.9	32.7	34.4	35.2
38.0	30.2								
30.0	45.2	41.7	21.9	19.0	17.7	-39.7	32.5	34.1	35.0
37.7	30.0								
36.0	44.9	41.4	22.4	19.3	17.8	-39.5	32.3	33.8	34.8
37.4	29.8								
42.0	44.7	41.2	22.8	19.6	18.0	-39.4	32.1	33.5	34.6
37.2	29.7								
48.0	44.5	41.0	23.3	19.9	18.1	-39.3	31.9	33.3	34.4
36.9	29.5								
54.0	44.3	40.8	23.6	20.1	18.2	-39.2	31.7	33.0	34.3
36.7	29.3								
60.0	44.1	40.6	23.8	20.4	18.2	-39.1	31.5	32.8	34.1
36.4	29.2								
66.0	43.9	40.4	23.9	20.6	18.2	-39.0	31.3	32.6	33.9
36.2	29.0								
72.0	43.7	40.2	23.7	20.8	18.2	-39.0	31.1	32.3	33.8
36.0	28.8								
78.0	43.5	40.0	23.4	20.9	18.1	-39.0	30.9	32.1	33.6
35.8	28.7								
84.0	43.4	39.9	23.0	20.9	18.0	-39.0	30.8	31.9	33.5
35.6	28.5								
90.0	43.2	39.7	22.5	20.9	17.9	-39.1	30.6	31.7	33.3
35.4	28.4								
96.0	43.0	39.5	22.0	20.9	17.7	-39.1	30.5	31.5	33.2
35.2	28.2								
102.0	42.8	39.3	21.6	20.7	17.5	-39.2	30.3	31.3	33.0
35.0	28.1								
108.0	42.7	39.2	21.1	20.5	17.4	-39.3	30.2	31.2	32.9
34.8	28.0								
114.0	42.5	39.0	20.7	20.3	17.1	-39.5	30.0	31.0	32.8
34.6	27.8								
120.0	42.4	38.9	20.2	20.0	16.9	-39.6	29.9	30.8	32.7
34.5	27.7								
126.0	42.2	38.7	19.8	19.8	16.7	-39.7	29.8	30.7	32.5
34.3	27.6								
132.0	42.1	38.6	19.5	19.5	16.5	-39.9	29.6	30.5	32.4
34.2	27.5								
138.0	41.9	38.4	19.1	19.2	16.3	-40.1	29.5	30.4	32.3
34.0	27.3								
144.0	41.8	38.3	18.8	18.9	16.1	-40.3	29.4	30.2	32.2
33.9	27.2								
150.0	41.6	38.1	18.5	18.6	15.9	-40.4	29.3	30.1	32.1
33.7	27.1								
156.0	41.5	38.0	18.2	18.3	15.6	-40.6	29.1	29.9	31.9
33.6	27.0								
162.0	41.4	37.9	17.9	18.1	15.4	-40.8	29.0	29.8	31.8
33.4	26.9								

168.0	41.3	37.8	17.6	17.8	15.2	-41.0	28.9	29.7	31.7
33.3	26.8								
174.0	41.1	37.6	17.4	17.5	15.0	-41.1	28.8	29.5	31.6
33.2	26.7								
180.0	41.0	37.5	17.1	17.3	14.8	-41.3	28.7	29.4	31.5
33.0	26.6								
186.0	40.9	37.4	16.9	17.1	14.7	-41.5	28.6	29.3	31.4
32.9	26.5								
192.0	40.8	37.3	16.7	16.8	14.5	-41.7	28.5	29.2	31.3
32.8	26.4								
198.0	40.7	37.2	16.4	16.6	14.3	-41.8	28.4	29.1	31.2
32.7	26.3								
204.0	40.6	37.1	16.2	16.4	14.1	-42.0	28.3	28.9	31.1
32.6	26.2								
210.0	40.5	37.0	16.0	16.2	13.9	-42.2	28.2	28.8	31.0
32.4	26.1								
216.0	40.4	36.9	15.8	16.0	13.8	-42.3	28.1	28.7	31.0
32.3	26.0								
222.0	40.3	36.8	15.7	15.8	13.6	-42.5	28.0	28.6	30.9
32.2	25.9								
228.0	40.2	36.7	15.5	15.6	13.5	-42.6	27.9	28.5	30.8
32.1	25.8								
234.0	40.1	36.6	15.3	15.4	13.3	-42.8	27.8	28.4	30.7
32.0	25.7								
240.0	40.0	36.5	15.1	15.2	13.2	-42.9	27.7	28.3	30.6
31.9	25.6								
246.0	39.9	36.4	15.0	15.1	13.0	-43.1	27.6	28.2	30.5
31.8	25.6								
252.0	39.8	36.3	14.8	14.9	12.9	-43.2	27.6	28.1	30.4
31.7	25.5								
258.0	39.7	36.2	14.7	14.7	12.7	-43.3	27.5	28.0	30.4
31.6	25.4								
264.0	39.6	36.1	14.5	14.6	12.6	-43.5	27.4	27.9	30.3
31.5	25.3								
270.0	39.5	36.0	14.4	14.4	12.5	-43.6	27.3	27.8	30.2
31.4	25.2								
276.0	39.4	35.9	14.2	14.3	12.3	-43.7	27.2	27.7	30.1
31.3	25.2								
282.0	39.3	35.8	14.1	14.1	12.2	-43.9	27.2	27.7	30.0
31.2	25.1								
288.0	39.3	35.8	14.0	14.0	12.1	-44.0	27.1	27.6	30.0
31.2	25.0								
294.0	39.2	35.7	13.9	13.9	12.0	-44.1	27.0	27.5	29.9
31.1	24.9								

1AUDIBLE NOISE CALCULATION - FAIR

DIST FROM REFERENCE E230B2	TOTALS L5 E230C1	L50	230A	230B	230C	G1	E230A1	E230A2	E230B1
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(FEET)	(DBA)	(DBA)							
-300.0	16.6	13.1	-13.4	-14.1	-15.2	-71.6	5.1	4.2	8.3
7.4	2.9								
-294.0	16.7	13.2	-13.3	-14.0	-15.1	-71.5	5.2	4.4	8.5
7.6	3.0								
-288.0	16.8	13.3	-13.2	-13.9	-15.0	-71.5	5.4	4.5	8.6
7.7	3.2								
-282.0	17.0	13.5	-13.1	-13.9	-14.9	-71.4	5.5	4.6	8.8
7.8	3.3								
-276.0	17.1	13.6	-13.1	-13.8	-14.9	-71.3	5.7	4.7	8.9
7.9	3.5								
-270.0	17.3	13.8	-13.0	-13.7	-14.8	-71.2	5.9	4.9	9.1
8.0	3.6								
-264.0	17.4	13.9	-12.9	-13.6	-14.7	-71.2	6.0	5.0	9.3
8.2	3.8								
-258.0	17.6	14.1	-12.8	-13.5	-14.6	-71.1	6.2	5.1	9.4
8.3	3.9								
-252.0	17.7	14.2	-12.7	-13.4	-14.5	-71.0	6.4	5.3	9.6
8.4	4.1								
-246.0	17.9	14.4	-12.6	-13.4	-14.4	-70.9	6.6	5.4	9.8
8.6	4.2								
-240.0	18.1	14.6	-12.5	-13.3	-14.3	-70.8	6.7	5.6	10.0
8.7	4.4								
-234.0	18.2	14.7	-12.4	-13.2	-14.2	-70.7	6.9	5.8	10.2
8.9	4.6								
-228.0	18.4	14.9	-12.3	-13.1	-14.1	-70.6	7.2	5.9	10.4
9.0	4.7								
-222.0	18.6	15.1	-12.2	-13.0	-14.0	-70.5	7.4	6.1	10.6
9.2	4.9								
-216.0	18.8	15.3	-12.1	-12.9	-13.9	-70.4	7.6	6.3	10.8
9.3	5.1								
-210.0	19.0	15.5	-12.0	-12.8	-13.8	-70.4	7.8	6.4	11.0
9.5	5.3								
-204.0	19.2	15.7	-11.9	-12.7	-13.7	-70.3	8.1	6.6	11.3
9.6	5.5								
-198.0	19.4	15.9	-11.8	-12.6	-13.6	-70.2	8.3	6.8	11.5
9.8	5.7								
-192.0	19.7	16.2	-11.7	-12.5	-13.5	-70.1	8.6	7.0	11.8
10.0	5.9								
-186.0	19.9	16.4	-11.6	-12.4	-13.4	-70.0	8.9	7.2	12.0
10.2	6.1								
-180.0	20.1	16.6	-11.4	-12.3	-13.3	-69.9	9.2	7.4	12.3
10.4	6.3								
-174.0	20.4	16.9	-11.3	-12.2	-13.2	-69.7	9.5	7.7	12.6
10.6	6.6								
-168.0	20.7	17.2	-11.2	-12.1	-13.1	-69.6	9.8	7.9	12.9
10.8	6.8								
-162.0	20.9	17.4	-11.1	-12.0	-12.9	-69.5	10.1	8.2	13.2

11.0	7.0								
-156.0	21.2	17.7	-10.9	-11.8	-12.8	-69.4	10.5	8.4	13.5
11.2	7.2								
-150.0	21.5	18.0	-10.8	-11.7	-12.7	-69.3	10.9	8.7	13.8
11.4	7.5								
-144.0	21.8	18.3	-10.7	-11.6	-12.6	-69.2	11.3	9.0	14.1
11.7	7.7								
-138.0	22.1	18.6	-10.5	-11.5	-12.4	-69.1	11.7	9.3	14.4
11.9	7.9								
-132.0	22.4	18.9	-10.4	-11.4	-12.3	-68.9	12.1	9.6	14.6
12.2	8.1								
-126.0	22.7	19.2	-10.2	-11.2	-12.2	-68.8	12.6	9.9	14.9
12.4	8.3								
-120.0	23.0	19.5	-10.1	-11.1	-12.0	-68.7	13.0	10.3	15.0
12.7	8.5								
-114.0	23.2	19.7	-9.9	-11.0	-11.9	-68.6	13.4	10.7	15.2
13.0	8.6								
-108.0	23.5	20.0	-9.7	-10.8	-11.7	-68.4	13.8	11.1	15.3
13.3	8.7								
-102.0	23.6	20.1	-9.6	-10.7	-11.6	-68.3	14.0	11.5	15.3
13.6	8.8								
-96.0	23.8	20.3	-9.4	-10.5	-11.4	-68.2	14.1	11.9	15.2
13.9	8.8								
-90.0	23.9	20.4	-9.2	-10.4	-11.3	-68.0	14.1	12.3	15.0
14.2	8.8								
-84.0	23.9	20.4	-9.0	-10.2	-11.1	-67.9	13.9	12.8	14.9
14.5	8.7								
-78.0	23.9	20.4	-8.8	-10.0	-10.9	-67.7	13.6	13.2	14.6
14.7	8.7								
-72.0	23.9	20.4	-8.6	-9.9	-10.8	-67.6	13.2	13.6	14.4
15.0	8.5								
-66.0	23.9	20.4	-8.4	-9.7	-10.6	-67.4	12.8	13.9	14.1
15.2	8.4								
-60.0	23.9	20.4	-8.2	-9.5	-10.4	-67.3	12.4	14.1	13.8
15.4	8.2								
-54.0	23.8	20.3	-8.0	-9.3	-10.2	-67.1	11.9	14.1	13.5
15.6	8.0								
-48.0	23.6	20.1	-7.7	-9.1	-10.0	-66.9	11.5	14.0	13.2
15.6	7.8								
-42.0	23.4	19.9	-7.5	-9.0	-9.8	-66.8	11.1	13.7	12.9
15.6	7.6								
-36.0	23.2	19.7	-7.2	-8.7	-9.6	-66.6	10.7	13.4	12.6
15.6	7.4								
-30.0	23.0	19.5	-6.9	-8.5	-9.4	-66.4	10.3	13.0	12.3
15.4	7.1								
-24.0	22.7	19.2	-6.6	-8.3	-9.2	-66.3	10.0	12.5	12.0
15.2	6.9								
-18.0	22.4	18.9	-6.3	-8.1	-9.0	-66.1	9.6	12.1	11.8
15.0	6.7								
-12.0	22.1	18.6	-6.0	-7.9	-8.8	-65.9	9.3	11.7	11.5

14.7	6.5								
-6.0	21.8	18.3	-5.7	-7.6	-8.6	-65.7	9.0	11.2	11.3
14.5	6.2								
.0	21.5	18.0	-5.3	-7.4	-8.4	-65.5	8.7	10.8	11.0
14.2	6.0								
6.0	21.2	17.7	-4.9	-7.1	-8.1	-65.4	8.5	10.5	10.8
13.9	5.8								
12.0	20.9	17.4	-4.5	-6.8	-7.9	-65.2	8.2	10.1	10.6
13.6	5.6								
18.0	20.7	17.2	-4.0	-6.6	-7.7	-65.0	7.9	9.8	10.4
13.3	5.4								
24.0	20.4	16.9	-3.6	-6.3	-7.5	-64.9	7.7	9.4	10.2
13.0	5.2								
30.0	20.2	16.7	-3.1	-6.0	-7.3	-64.7	7.5	9.1	10.0
12.7	5.0								
36.0	19.9	16.4	-2.6	-5.7	-7.2	-64.5	7.3	8.8	9.8
12.4	4.8								
42.0	19.7	16.2	-2.2	-5.4	-7.0	-64.4	7.1	8.5	9.6
12.2	4.7								
48.0	19.5	16.0	-1.7	-5.1	-6.9	-64.3	6.9	8.3	9.4
11.9	4.5								
54.0	19.3	15.8	-1.4	-4.9	-6.8	-64.2	6.7	8.0	9.3
11.7	4.3								
60.0	19.1	15.6	-1.2	-4.6	-6.8	-64.1	6.5	7.8	9.1
11.4	4.2								
66.0	18.9	15.4	-1.1	-4.4	-6.8	-64.0	6.3	7.6	8.9
11.2	4.0								
72.0	18.7	15.2	-1.3	-4.2	-6.8	-64.0	6.1	7.3	8.8
11.0	3.8								
78.0	18.5	15.0	-1.6	-4.1	-6.9	-64.0	5.9	7.1	8.6
10.8	3.7								
84.0	18.4	14.9	-2.0	-4.1	-7.0	-64.0	5.8	6.9	8.5
10.6	3.5								
90.0	18.2	14.7	-2.5	-4.1	-7.1	-64.1	5.6	6.7	8.3
10.4	3.4								
96.0	18.0	14.5	-3.0	-4.1	-7.3	-64.1	5.5	6.5	8.2
10.2	3.2								
102.0	17.8	14.3	-3.4	-4.3	-7.5	-64.2	5.3	6.3	8.0
10.0	3.1								
108.0	17.7	14.2	-3.9	-4.5	-7.6	-64.3	5.2	6.2	7.9
9.8	3.0								
114.0	17.5	14.0	-4.3	-4.7	-7.9	-64.5	5.0	6.0	7.8
9.6	2.8								
120.0	17.4	13.9	-4.8	-5.0	-8.1	-64.6	4.9	5.8	7.7
9.5	2.7								
126.0	17.2	13.7	-5.2	-5.2	-8.3	-64.7	4.8	5.7	7.5
9.3	2.6								
132.0	17.1	13.6	-5.5	-5.5	-8.5	-64.9	4.6	5.5	7.4
9.2	2.5								
138.0	16.9	13.4	-5.9	-5.8	-8.7	-65.1	4.5	5.4	7.3

9.0	2.3								
144.0	16.8	13.3	-6.2	-6.1	-8.9	-65.3	4.4	5.2	7.2
8.9	2.2								
150.0	16.6	13.1	-6.5	-6.4	-9.1	-65.4	4.3	5.1	7.1
8.7	2.1								
156.0	16.5	13.0	-6.8	-6.7	-9.4	-65.6	4.1	4.9	6.9
8.6	2.0								
162.0	16.4	12.9	-7.1	-6.9	-9.6	-65.8	4.0	4.8	6.8
8.4	1.9								
168.0	16.3	12.8	-7.4	-7.2	-9.8	-66.0	3.9	4.7	6.7
8.3	1.8								
174.0	16.1	12.6	-7.6	-7.5	-10.0	-66.1	3.8	4.5	6.6
8.2	1.7								
180.0	16.0	12.5	-7.9	-7.7	-10.2	-66.3	3.7	4.4	6.5
8.0	1.6								
186.0	15.9	12.4	-8.1	-7.9	-10.3	-66.5	3.6	4.3	6.4
7.9	1.5								
192.0	15.8	12.3	-8.3	-8.2	-10.5	-66.7	3.5	4.2	6.3
7.8	1.4								
198.0	15.7	12.2	-8.6	-8.4	-10.7	-66.8	3.4	4.1	6.2
7.7	1.3								
204.0	15.6	12.1	-8.8	-8.6	-10.9	-67.0	3.3	3.9	6.1
7.6	1.2								
210.0	15.5	12.0	-9.0	-8.8	-11.1	-67.2	3.2	3.8	6.0
7.4	1.1								
216.0	15.4	11.9	-9.2	-9.0	-11.2	-67.3	3.1	3.7	6.0
7.3	1.0								
222.0	15.3	11.8	-9.3	-9.2	-11.4	-67.5	3.0	3.6	5.9
7.2	.9								
228.0	15.2	11.7	-9.5	-9.4	-11.5	-67.6	2.9	3.5	5.8
7.1	.8								
234.0	15.1	11.6	-9.7	-9.6	-11.7	-67.8	2.8	3.4	5.7
7.0	.7								
240.0	15.0	11.5	-9.9	-9.8	-11.8	-67.9	2.7	3.3	5.6
6.9	.6								
246.0	14.9	11.4	-10.0	-9.9	-12.0	-68.1	2.6	3.2	5.5
6.8	.6								
252.0	14.8	11.3	-10.2	-10.1	-12.1	-68.2	2.6	3.1	5.4
6.7	.5								
258.0	14.7	11.2	-10.3	-10.3	-12.3	-68.3	2.5	3.0	5.4
6.6	.4								
264.0	14.6	11.1	-10.5	-10.4	-12.4	-68.5	2.4	2.9	5.3
6.5	.3								
270.0	14.5	11.0	-10.6	-10.6	-12.5	-68.6	2.3	2.8	5.2
6.4	.2								
276.0	14.4	10.9	-10.8	-10.7	-12.7	-68.7	2.2	2.7	5.1
6.3	.2								
282.0	14.3	10.8	-10.9	-10.9	-12.8	-68.9	2.2	2.7	5.0
6.2	.1								
288.0	14.3	10.8	-11.0	-11.0	-12.9	-69.0	2.1	2.6	5.0

6.2	.0								
294.0	14.2	10.7	-11.1	-11.1	-13.0	-69.1	2.0	2.5	4.9
6.1	-.1								

1ELECTRIC FIELD CALCULATIONS

PGE Biglow Solar 230kV RFA5
 Analysis 2026/07/23 w/ exist 230kV

	DIST. FROM REFERENCE FEET	HEIGHT FEET	MAXIMUM GRADIENT (KV/CM)	SUBCON. DIAM. (IN)	NO. OF SUBCON.	PHASE ANGLE (DEGREES)
230A	64.00	35.58	10.83	1.11	2	.0
230B	86.00	56.17	10.76	1.11	2	120.0
230C	64.00	72.75	10.48	1.11	2	240.0
G1	77.00	87.81	5.07	.51	1	.0
E230A1	-94.40	38.50	14.14	1.20	1	.0
E230A2	-55.60	38.50	14.14	1.20	1	.0
E230B1	-105.00	54.50	15.00	1.20	1	120.0
E230B2	-45.00	54.50	15.11	1.20	1	120.0
E230C1	-94.40	70.50	13.61	1.20	1	-120.0
E230C2	-55.60	70.50	13.51	1.20	1	-120.0
E230G	-75.00	86.50	5.85	.50	1	.0

SENSOR HT. = 3.3 FEET

DIST FROM REFERENCE THETAX FEET (DEGREES)	E-FIELD SPACE POTENTIAL (KV/METER) (VOLTS)	THETA (DEGREES)	EY-FIELD (KV/METER)	THETAY (DEGREES)	EX-FIELD (KV/METER)
-300.0	.092	88.8	.092	23.9	.002
12.6	92.0				
-294.0	.096	88.7	.096	23.4	.002
11.2	95.7				
-288.0	.100	88.7	.100	22.9	.002
9.7	99.7				
-282.0	.104	88.7	.104	22.3	.002
8.1	103.8				
-276.0	.108	88.7	.108	21.7	.003
6.2	108.2				
-270.0	.113	88.7	.113	21.0	.003
4.1	112.8				
-264.0	.118	88.7	.118	20.2	.003
1.8	117.7				
-258.0	.123	88.7	.123	19.4	.003
-.8	122.8				
-252.0	.128	88.7	.128	18.4	.003
-3.8	128.2				

-246.0	.134	88.7	.134	17.4	.003
-7.2	133.8				
-240.0	.140	88.7	.140	16.2	.004
-11.1	139.6				
-234.0	.146	88.7	.146	14.8	.004
-15.6	145.8				
-228.0	.152	88.7	.152	13.3	.004
-20.7	152.1				
-222.0	.159	88.7	.159	11.6	.005
-26.5	158.6				
-216.0	.165	88.7	.165	9.6	.005
-33.1	165.3				
-210.0	.172	88.8	.172	7.3	.006
-40.6	172.1				
-204.0	.179	88.8	.179	4.6	.006
-48.9	178.9				
-198.0	.186	88.9	.186	1.4	.007
-58.0	185.6				
-192.0	.192	89.0	.192	-2.3	.008
-67.6	192.2				
-186.0	.199	89.1	.199	-6.8	.010
-77.6	198.4				
-180.0	.205	89.1	.205	-12.3	.012
-87.7	204.2				
-174.0	.210	89.2	.210	-19.0	.015
-97.8	209.8				
-168.0	.216	89.1	.216	-27.2	.019
-107.8	215.4				
-162.0	.223	88.9	.223	-37.6	.025
-117.6	222.4				
-156.0	.234	88.1	.234	-50.5	.033
-127.2	233.3				
-150.0	.255	86.6	.254	-66.2	.044
-136.5	253.7				
-144.0	.294	84.3	.293	-84.0	.059
-145.6	292.9				
-138.0	.366	82.1	.363	-102.3	.079
-154.1	363.4				
-132.0	.484	80.6	.477	-119.0	.105
-161.8	479.3				
-126.0	.659	80.1	.649	-133.2	.137
-168.6	652.5				
-120.0	.899	80.5	.887	-144.5	.170
-174.4	890.2				
-114.0	1.200	81.5	1.187	-153.3	.196
-179.4	1188.3				
-108.0	1.538	83.0	1.526	-160.0	.204
176.2	1523.9				
-102.0	1.868	84.8	1.860	-164.9	.183
171.8	1853.0				

-96.0	2.137	86.7	2.134	-168.4	.137
166.2	2123.0				
-90.0	2.311	88.3	2.310	-170.9	.082
157.6	2299.8				
-84.0	2.393	89.3	2.393	-172.4	.039
144.0	2386.9				
-78.0	2.420	89.8	2.420	-173.3	.013
127.1	2416.4				
-72.0	2.420	90.1	2.420	-173.4	.007
-28.3	2417.2				
-66.0	2.396	90.7	2.396	-172.9	.034
-27.5	2389.3				
-60.0	2.315	91.7	2.314	-171.7	.077
-17.2	2303.6				
-54.0	2.142	93.3	2.138	-169.8	.132
-10.1	2127.7				
-48.0	1.872	95.2	1.864	-167.1	.178
-5.0	1857.2				
-42.0	1.539	97.1	1.528	-163.6	.197
-.4	1525.5				
-36.0	1.195	98.7	1.181	-159.2	.188
4.5	1183.6				
-30.0	.883	100.1	.869	-154.3	.161
10.8	874.1				
-24.0	.625	101.4	.613	-149.5	.126
19.0	618.4				
-18.0	.426	102.6	.415	-146.6	.093
30.5	420.6				
-12.0	.280	103.1	.273	-149.3	.066
47.6	277.8				
-6.0	.192	97.8	.190	-164.4	.048
74.6	195.3				
.0	.190	82.9	.189	170.5	.045
110.7	193.8				
6.0	.268	78.2	.262	156.9	.057
140.8	266.3				
12.0	.391	78.5	.383	155.0	.078
159.1	387.4				
18.0	.559	79.2	.549	158.1	.107
170.0	554.1				
24.0	.782	79.8	.770	162.6	.142
177.0	775.5				
30.0	1.071	80.5	1.056	167.3	.182
-178.2	1062.4				
36.0	1.431	81.4	1.415	171.5	.220
-174.5	1420.0				
42.0	1.852	82.6	1.837	175.2	.247
-171.1	1838.1				
48.0	2.296	84.2	2.284	178.3	.242
-166.4	2277.1				

54.0	2.682	86.3	2.676	-178.8	.188
-156.4	2658.7				
60.0	2.906	88.9	2.905	-175.9	.105
-119.5	2878.6				
66.0	2.883	91.7	2.882	-172.3	.141
-45.5	2854.9				
72.0	2.614	94.4	2.606	-167.3	.248
-23.7	2587.1				
78.0	2.189	96.5	2.175	-159.9	.308
-16.5	2167.3				
84.0	1.742	97.5	1.727	-149.0	.306
-12.2	1727.8				
90.0	1.383	96.6	1.374	-134.2	.264
-8.0	1375.7				
96.0	1.156	94.5	1.152	-117.2	.206
-2.2	1152.4				
102.0	1.035	92.6	1.034	-101.3	.151
6.4	1032.2				
108.0	.965	91.9	.965	-88.5	.108
18.8	961.7				
114.0	.906	92.1	.905	-78.9	.080
35.0	902.6				
120.0	.842	92.4	.842	-71.5	.064
52.7	839.7				
126.0	.773	92.8	.772	-65.7	.055
68.6	771.4				
132.0	.702	93.1	.701	-60.9	.049
80.9	700.9				
138.0	.633	93.3	.632	-56.7	.044
90.2	631.7				
144.0	.568	93.4	.567	-52.9	.039
97.1	566.7				
150.0	.508	93.5	.507	-49.4	.035
102.6	507.2				
156.0	.454	93.5	.454	-46.1	.031
107.0	454.0				
162.0	.407	93.4	.407	-43.0	.027
110.7	406.9				
168.0	.366	93.3	.365	-40.1	.023
114.0	365.6				
174.0	.330	93.2	.329	-37.2	.020
117.0	329.6				
180.0	.298	93.1	.298	-34.4	.018
119.8	298.2				
186.0	.271	92.9	.271	-31.8	.015
122.4	271.0				
192.0	.247	92.8	.247	-29.3	.013
124.8	247.2				
198.0	.227	92.7	.226	-26.8	.012
127.2	226.4				

204.0	.208	92.6	.208	-24.5	.010
129.5	208.3				
210.0	.192	92.4	.192	-22.3	.009
131.7	192.3				
216.0	.178	92.3	.178	-20.1	.008
133.9	178.2				
222.0	.166	92.2	.166	-18.1	.007
136.0	165.7				
228.0	.155	92.1	.155	-16.2	.006
138.1	154.6				
234.0	.145	92.0	.145	-14.4	.006
140.2	144.6				
240.0	.136	92.0	.136	-12.7	.005
142.1	135.7				
246.0	.128	91.9	.128	-11.1	.005
144.1	127.7				
252.0	.120	91.8	.120	-9.5	.004
146.0	120.4				
258.0	.114	91.7	.114	-8.1	.004
147.8	113.8				
264.0	.108	91.7	.108	-6.7	.003
149.6	107.8				
270.0	.102	91.6	.102	-5.4	.003
151.3	102.3				
276.0	.097	91.6	.097	-4.1	.003
153.0	97.3				
282.0	.093	91.5	.093	-3.0	.003
154.7	92.6				
288.0	.088	91.5	.088	-1.9	.002
156.2	88.3				
294.0	.084	91.4	.084	-.8	.002
157.8	84.4				

1MAGNETIC FIELD CALCULATIONS

SENSOR HT. = 3.3 FEET

DIST FROM REFERENCE FEET	B-FIELD (GAUSS)	THETA	BY-FIELD (GAUSS)	THETAY	BX-FIELD (GAUSS)	THETAX
-300.0	.02781263	91.8	.02779982	237.0	.00400805	134.9
-294.0	.02858622	91.8	.02857199	236.9	.00422371	134.7
-288.0	.02940615	91.9	.02939029	236.7	.00445760	134.3
-282.0	.03027683	92.0	.03025905	236.6	.00471184	134.0
-276.0	.03120319	92.1	.03118314	236.4	.00498887	133.6
-270.0	.03219084	92.2	.03216811	236.2	.00529153	133.2
-264.0	.03324614	92.3	.03322021	236.1	.00562308	132.7
-258.0	.03437639	92.4	.03434660	235.8	.00598733	132.2

-252.0	.03558986	92.6	.03555538	235.6	.00638872	131.6
-246.0	.03689611	92.7	.03685588	235.4	.00683247	131.0
-240.0	.03830613	92.9	.03825881	235.1	.00732475	130.3
-234.0	.03983259	93.1	.03977640	234.8	.00787284	129.5
-228.0	.04149024	93.3	.04142287	234.4	.00848543	128.5
-222.0	.04329617	93.6	.04321454	234.0	.00917292	127.5
-216.0	.04527036	93.9	.04517035	233.5	.00994781	126.3
-210.0	.04743610	94.2	.04731212	233.0	.01082523	125.0
-204.0	.04982070	94.6	.04966513	232.4	.01182352	123.5
-198.0	.05245619	95.1	.05225844	231.8	.01296507	121.8
-192.0	.05538014	95.7	.05512540	231.0	.01427731	119.8
-186.0	.05863656	96.3	.05830386	230.1	.01579393	117.6
-180.0	.06227699	97.1	.06183628	229.1	.01755645	115.0
-174.0	.06636141	97.9	.06576913	227.9	.01961624	112.1
-168.0	.07095915	99.0	.07015136	226.5	.02203717	108.7
-162.0	.07614940	100.2	.07503092	224.8	.02489953	104.8
-156.0	.08202062	101.7	.08044755	222.9	.02830640	100.2
-150.0	.08866785	-76.5	.08641873	220.8	.03239520	95.0
-144.0	.09618531	-74.3	.09291252	218.3	.03735923	88.9
-138.0	.10464950	-71.7	.09979666	215.5	.04348499	81.8
-132.0	.11408380	-68.5	.10674880	212.6	.05120286	73.9
-126.0	.12439380	-64.5	.11311690	209.5	.06111387	65.3
-120.0	.13526510	-59.6	.11775570	206.6	.07388182	56.5
-114.0	.14604520	-53.7	.11896820	204.1	.08983007	48.2
-108.0	.15569580	-46.8	.11482920	202.3	.10824710	41.1
-102.0	.16298060	-39.2	.10414750	201.7	.12690310	35.8
-96.0	.16701540	-31.4	.08772096	202.7	.14267000	32.3
-90.0	.16797090	-24.0	.06857552	205.9	.15341680	30.5
-84.0	.16727550	-17.5	.05023748	212.1	.15956360	30.0
-78.0	.16685250	-11.6	.03448322	223.3	.16343010	30.2
-72.0	.16784840	-6.0	.02174846	247.7	.16693810	30.9
-66.0	.16985640	.2	.01842586	-56.6	.16985570	31.9
-60.0	.17118280	7.2	.03225236	-16.1	.16987470	33.5
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-36.0	.14658300	36.3	.09291574	18.6	.12053700	51.0
-30.0	.13545570	41.7	.09504515	23.9	.10455110	57.1
-24.0	.12438910	-133.8	.09354040	29.1	.09026218	62.9
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.0	.08630098	-122.0	.07402324	47.9	.04900707	77.6
6.0	.07836549	-120.3	.06816372	52.1	.04189734	78.3
12.0	.07098507	-119.1	.06225368	56.1	.03593370	77.2
18.0	.06417090	-118.6	.05639571	60.3	.03123115	73.3
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30.0	.05270811	-120.8	.04537572	68.4	.02740601	54.5
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48.0	.05142637	36.7	.03400610	65.2	.04264680	25.1
54.0	.05913151	33.2	.03476701	52.6	.05014928	21.8
60.0	.06771789	36.3	.04079406	37.8	.05484919	21.4
66.0	.07455617	43.0	.05091257	27.3	.05451157	23.9
72.0	.07821605	51.2	.06107118	22.0	.04914202	29.7
78.0	.07853387	59.4	.06788722	20.2	.04128102	40.0
84.0	.07625346	66.7	.07037739	20.9	.03429892	55.0
90.0	.07242226	72.5	.06939825	23.2	.03016600	72.5
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120.0	.05253164	-97.5	.05216913	43.1	.02409398	119.9
126.0	.04969893	-97.1	.04938813	46.4	.02225173	123.5
132.0	.04716463	-96.7	.04689965	49.2	.02035386	126.4
138.0	.04487223	-96.2	.04465044	51.6	.01851133	128.8
144.0	.04278276	-95.7	.04260068	53.5	.01678907	131.0
150.0	.04086939	-95.2	.04072224	55.0	.01521759	132.8
156.0	.03911234	-94.7	.03899471	56.3	.01380508	134.4
162.0	.03749584	-94.3	.03740241	57.3	.01254676	135.8
168.0	.03600636	-93.9	.03593235	58.1	.01143119	137.0
174.0	.03463183	-93.5	.03457317	58.8	.01044418	138.1
180.0	.03336131	-93.2	.03331468	59.3	.00957101	139.1
186.0	.03218481	-92.9	.03214757	59.7	.00879767	140.0
192.0	.03109330	-92.6	.03106337	60.1	.00811138	140.7
198.0	.03007858	-92.4	.03005436	60.4	.00750080	141.4
204.0	.02913325	-92.2	.02911350	60.6	.00695601	142.0
210.0	.02825072	-92.0	.02823448	60.8	.00646844	142.5
216.0	.02742507	-91.8	.02741161	60.9	.00603073	142.9
222.0	.02665100	-91.7	.02663974	61.1	.00563652	143.3
228.0	.02592382	-91.6	.02591432	61.2	.00528041	143.7
234.0	.02523932	-91.5	.02523124	61.2	.00495773	144.0
240.0	.02459377	-91.4	.02458684	61.3	.00466448	144.2
246.0	.02398382	-91.3	.02397782	61.4	.00439721	144.5
252.0	.02340649	-91.2	.02340127	61.4	.00415297	144.7
258.0	.02285914	-91.2	.02285455	61.4	.00392918	144.8
264.0	.02233935	-91.1	.02233530	61.4	.00372361	145.0
270.0	.02184500	-91.1	.02184139	61.5	.00353433	145.1
276.0	.02137415	-91.0	.02137091	61.5	.00335965	145.2
282.0	.02092506	-91.0	.02092215	61.5	.00319808	145.3
288.0	.02049618	-90.9	.02049354	61.5	.00304834	145.4
294.0	.02008609	-90.9	.02008368	61.5	.00290927	145.4

**Attachment 4. Operations and
Maintenance Plan Framework for Solar
Components Approved under RFA 4 and
Proposed under RFA 5**

Operations and Maintenance Plan Framework for Solar Components Approved under RFA 4 and Proposed under RFA 5

**Biglow Canyon Wind Farm
Request for Amendment 5**

Prepared for



Portland General Electric Company

Prepared by



October 2026

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Acronyms and Abbreviations

Acronym/Abbreviation	Definition
BCWF	Biglow Canyon Wind Farm
BESS	battery energy storage system
BIGL	BIGL bn, LLC
BMS	battery management system
Certificate Holder, or PGE	Portland General Electric Company
EFSC	Energy Facility Siting Council
EOP	Emergency Operations Response Plan
EPCRA	Emergency Planning and Community Right-to-Know Act
MV	medium voltage
O&M	operations and maintenance
ODOE	Oregon Department of Energy
PV	photovoltaic
QA/QC	quality assurance/quality control
RFA	Request for Amendment
SCADA	supervisory control and data acquisition
WMP	Wildfire Mitigation Plan

Table 1. Council Imposed Requirements

Summary	Timing	Requirement
Prior to Operations - Plan Finalization		
Action Based Plan		This plan shall be finalized based on actions that can be monitored, tracked, and recorded. Detailed narrative or explanation that is not a specific action must be removed. Filter for clarity and remove unnecessary high-level narrative.
Qualifications and Contact Information		<p><u>In the Plan:</u> Include the contact information for:</p> <ol style="list-style-type: none"> 1. The individuals that will manage and oversee vendors and contractors. 2. The individuals that will perform design-phase safety reviews. <p><u>Evidence to Support Plan Review:</u> Certificate must provide to the Department the names, contact information and qualifications of the individuals that will manage and oversee vendors and contractors; and of the individuals that will perform design-phase safety reviews. The Department may request additional information or justification for any individuals where the experience or qualifications is inadequate.</p>
Incorporation of requirements/citations from applicable site certificate conditions, protocols and technical plans		<p><u>In the Plan:</u> Identify all technical and site management plans applicable to operations and compliance for the solar components; incorporate relevant action items into the plan.</p> <p>At a minimum, the plan must reference and incorporate the Emergency Operations Responses Plan, Operational Spill Prevention Control and Countermeasure Plan, Operational Wildlife Mitigation Plan, and Comprehensive Revegetation, Noxious Weed and Soil Reclamation Plan.</p>
Inspection and maintenance		<p><u>In the Plan:</u> Identify all inspections and maintenance activities, schedule, protocol and inspection documentation format.</p> <p><u>Evidence to Support Plan Review:</u> Provide documentation to be used to track maintenance and inspection activities. If information will be tracked via software, explain, demonstrate and provide available data.</p>
Vendor Performance Scoring System		<p><u>In the Plan:</u> The final plan shall include details about the certificate holder's vendor performance scoring system. The scoring system must, at a minimum, evaluate vendor response time, corrective maintenance scoring rates and inspection completion.</p>
Operations and Maintenance Budget Tracking and Forecasting		<p><u>In the Plan:</u> The final plan shall include a section for Operations and Maintenance Budget Tracking, including but not limited to, a summary of the basis for the amount estimated in the initial maintenance reserve, and an</p>

**Operations and Maintenance Plan Framework
for Solar Components Approved Under RFA 4 and Proposed Under RFA 5**

Summary	Timing	Requirement
		explanation of the 5-year life cycle cost modeling. The plan shall include information about the estimated and available budget. Future plan updates must include 5-year life cycle cost modeling results.
Third-Party O&M Budget Audit	<u>In the Plan:</u>	The final plan shall include information about annual third-party condition assessments, and ensure that the scope of the assessment includes annual review of vendor/contractor performance against warranty and reliability benchmarks.
Build Transfer Agreement	<u>Evidence to Support Plan Review:</u>	Provide a copy of the executed Build Transfer Agreement (BTA). Confidential terms and conditions, unrelated to the roles, responsibilities, oversight and control of the certificate holder, third-parties, site certificate and facility, may be redacted from the executed BTA provided to the Department.
Community Outreach	<u>In the Plan:</u>	The final plan shall include names and addresses of participating landowners, and shall detail the schedule, agenda and outreach efforts for annual coordination meetings, to be conducted by the certificate holder. The final plan shall require that the certificate holder invite Sherman County emergency responders and ODOE to each annual meeting. The plan shall require minutes from each meeting. Any issues will be tracked and evaluated to determine the appropriate response.
Reporting	<u>In the Plan:</u>	<p>Require reporting to the Department of the following:</p> <ol style="list-style-type: none"> 1. Within 72-hours of a change in contractors, vendors or contract terms, report the change, the reasons for the change, and the identification, contact information and qualifications to the Department. 2. Monthly, report to the Department a summary of performance monitoring results (Vendor Performance Scoring System), including identification of any significant performance issues and corrective actions taken by or for the participating entity, contractor(s) and vendor(s). Certificate holder shall identify corrective actions, including stop work or removal from site, required of the vendor(s) for any performance scores less than 95% percent on-time inspection and repair completion rate. 3. Annually, provide to the Department a written report from a third-party contractor evaluating whether the established or forecasted operations and maintenance budget is adequate for site operations. 4. Annually, provide the agenda, attendees list and meeting minutes from the community outreach meetings. Certificate holder shall report any issues identified at the meeting and shall provide their response and/or resolution of the identified issue.

1.0 Introduction

This draft outline of the Operations and Maintenance (O&M) Plan for the amended Biglow Canyon Wind Farm (BCWF) integrates the Solar Components as identified in the BCWF Request for Amendment (RFA) 5 into the existing wind facility and approved solar facility. It has been jointly developed by Portland General Electric Company (PGE; the Certificate Holder) and BIGL bn, LLC (BIGL or Project Developer), a subsidiary of BrightNight, LLC, to establish the preliminary framework for how the Solar Components of the Amended BCWF will be operated, maintained, and managed in compliance with the Site Certificate and applicable regulatory standards.

This O&M Plan applies to both the RFA 4 Solar Facility and the RFA 5 Solar Facility. It does not govern the O&M of the existing wind energy infrastructure, which continues to be managed under the previously coordinated PGE Operational Safety Monitoring Program. The O&M Plan reflects lessons learned from legacy wind operations at BCWF and current best practices for utility-scale solar and storage projects.

The O&M Plan framework described in Section 3.0 outlines the structure of operational responsibilities, long-term maintenance protocols, quality assurance processes, environmental compliance measures, and integration with emergency response and monitoring systems. The Certificate Holder will provide an O&M Plan that will use this framework to further detail the specific actions required to operate and maintain the Solar Components. The final O&M plan will be submitted to the Oregon Department of Energy (ODOE) prior to the start of operation of the RFA 4 Solar Facility and will govern operations and maintenance of the RFA 5 Solar Facility as well. Both solar facilities will be managed together as one facility during operations.

The final O&M Plan will reference and incorporate several other technical and site management plans relevant to operations and compliance for the Solar Components at the amended BCWF. These include, but are not limited to, the following plans developed for the BCWF RFA 5:

- The standalone Emergency Operations Response Plan (EOP) specific to solar and battery energy storage system (BESS) components;
- The Construction-phase Wildfire Mitigation Plan (WMP) and the Operations-phase WMP, which outline prevention and response protocols for wildfire risk during all project phases;
- The Comprehensive Solar Revegetation and Soil Management Plan, which details vegetation establishment, monitoring, and long-term maintenance;
- The Dust Abatement Plan, which governs dust control measures during both construction and operations; and
- Other resource-specific plans (e.g., the Decommissioning Plan, spill prevention and control protocols) as required by the Site Certificate.

These documents will be cross-referenced with the final O&M Plan to ensure consistent implementation and clarity of responsibilities. The final O&M Plan will remain a living document, subject to regular review and revision in response to design changes, regulatory updates, and lessons learned during implementation.

2.0 Facility Partnership: Roles and Responsibilities

The Amended BCWF reflects a project delivery model that combines PGE’s regulatory responsibility and long-term ownership with development and technical execution support from BIGL. This structure is designed to ensure compliance with Site Certificate conditions while leveraging external technical expertise to deliver the proposed Solar Components efficiently and to current industry standards.

PGE, as the Certificate Holder, retains ultimate oversight and responsibility for the Amended BCWF, including the RFA 4 Solar Facility and the proposed RFA 5 Solar Facility. BIGL has been engaged to support the initial development and construction of these components under a Build Transfer Agreement and will also provide O&M management services for a minimum of the first 5 years of project operation. This approach allows for continuity between construction and early stage operation, while ensuring that all long-term operational accountability remains with PGE.

BrightNight and its subsidiary BIGL will implement a long-term O&M strategy grounded in industry best practices, internal experience, and a robust safety-first culture. While specific vendors have not yet been selected, BrightNight’s team draws on a strong national track record in solar and battery storage project delivery and management. The Solar Facility of the Amended BCWF will be supported by comprehensive O&M protocols that include scheduled preventive maintenance, real-time monitoring, remote diagnostics, and rapid response to equipment issues. BrightNight’s O&M management program, which emphasizes cradle-to-grave execution, 24/7 visibility into system performance, and continuous learning, will guide all operational phases. Quality assurance will be embedded through stringent contracting standards, rigorous design-phase safety reviews, and direct oversight by experienced internal personnel. Over the first 5 years of the project, BIGL will serve as the primary entity responsible for oversight of day-to-day maintenance performed by an experienced, qualified O&M provider and performance monitoring, while PGE’s role will be defined in coordination with project milestones, interconnection requirements, North American Electric Reliability Corporation compliance, and long-term asset management planning.

BrightNight is committed to working in partnership with qualified local vendors whenever possible, fostering regional economic benefits and ensuring on-the-ground responsiveness throughout the project’s operational life. All third-party vendors, whether local or national, will be selected through a rigorous procurement process that evaluates technical qualifications, safety performance, environmental compliance, and proven experience with utility-scale solar and battery storage facilities. Selected vendors will be required to adhere to industry best practices, such as:

- Implementing detailed preventive maintenance schedules,
- Providing trained and certified personnel,
- Using real-time monitoring and fault detection systems,
- Following all original equipment manufacturers’ maintenance and service guidelines,
- Maintaining transparent documentation and reporting protocols,
- Using digital maintenance management systems,
- Conducting regular quality assurance/quality control (QA/QC) inspections,

- Establishing clear escalation procedures for unplanned outages, and
- Participating in site-specific safety trainings and continuous improvement processes.

BrightNight is also acutely aware of the community concerns stemming from historical O&M challenges at the BCWF. Based on conversations with local stakeholders, a key feature of the O&M management strategy, though not highly technical, demonstrates the commitment to maintaining consistent communication with community members over the life of the BCWF Solar Components. The Project Developer and Certificate Holder will provide direct contact information and conduct regular check-ins to ensure residents feel empowered to raise questions or concerns. Any issues brought forward will be relayed promptly to the appropriate O&M teams for timely response and resolution. While BrightNight and PGE do not anticipate concerns of this nature, we believe creating a clear, accessible escalation path is an important part of building lasting community trust.

This structured approach ensures that any vendor engaged in the Amended BCWF will operate with the same high standards of safety, reliability, and performance that define BrightNight's operational philosophy.

This partnership structure does not alter the Certificate Holder's regulatory obligations or diminish its responsibility for compliance with the Energy Facility Siting Council (EFSC) and other applicable state and federal requirements. Rather, it provides a defined and managed pathway for project delivery that integrates third-party expertise into a framework that remains under PGE's control. Any third-party permits associated with construction activities will be secured through BIGL or its contractors but will be limited to standard, project-level requirements (e.g., encroachment, transport, building permits) and do not change the scope or structure of the existing site certificate.

Overall, the division of responsibilities between PGE and BIGL maintains clear regulatory accountability while enabling technically competent execution of the amended facility. This model is consistent with industry practices for utility-owned renewable infrastructure and is expected to support a timely and orderly expansion of the BCWF site in accordance with certificate conditions.

3.0 Integrated Operations and Maintenance Plan Framework

The Certificate Holder will submit a final version of the O&M Plan to ODOE prior to the commencement of operations. This Plan is intended to meet regulatory obligations, and to serve as the foundational framework guiding day-to-day operations of the Solar Components at the Amended BCWF.

To ensure consistency between compliance documentation and real-world implementation, the Plan will be updated as needed to fully incorporate the procedures, protocols, and tools adopted by the selected long-term O&M service provider. This integrated approach is designed to maintain a single, authoritative document that governs both regulatory compliance and operational execution, which eliminates the risk of conflicting or duplicative guidance.

3.1 Purpose and Applicability

The framework described in this section outlines the intended procedures for managing and maintaining the Solar Components of the Amended BCWF. It incorporates requirements from the Site Certificate, applicable codes, and protocols from the EOP, Decommissioning Plan, and supporting exhibits. This Plan applies to the Certificate Holder, BIGL, its contractors, and subcontractors. The final O&M Plan will be a living document. It shall be reviewed annually and revised in coordination with design changes, operational updates, or regulatory amendments.

3.2 Facility Description and Roles

The Amended BCWF includes legacy wind infrastructure and new solar photovoltaic (PV) and BESS systems. These additions are constructed under a Build Transfer Agreement by BIGL, with PGE retaining long-term ownership and regulatory oversight as the Certificate Holder.

- The Biglow Solar Components will be attended by staff, with an O&M building to support facility operations.
- Initial O&M management services for solar and BESS components will be performed by BIGL for 5 years.

3.3 Design and Equipment Selection

The Certificate Holder and BIGL are going through the design and equipment selection process. During final design, BIGL will consider all solar technologies available to ensure the most efficient and productive solar array layout and BESS configuration. The final O&M plan will incorporate O&M activities specific to the equipment selected, based on the manufacturers' instructions.

3.4 Preventative Maintenance and Asset Monitoring

BIGL will identify preventative maintenance measures and supporting equipment monitoring efforts to ensure safe and reliable operation of the facility.

3.4.1 Substation

- Thermal imaging for termination and buswork
- Visual inspection of structure foundation and conduit
- Lubrication of moving parts (breakers, switches, etc.)
- Cooling system checks
- Control room inspections visual and tests
- Label and nameplate check
- Vegetation management

3.4.2 PV System

- Routine module inspections and thermal imaging
- Torque checks per manufacturers recommendations
- Panel washing with water use logs (per Exhibit O limits)

- Annual and/or semiannual visual inspection of inverters, combiner boxes or load break disconnects, trackers, and all major equipment
- Supervisory control and data acquisition (SCADA) system tests and inspections
- Vegetation management

3.4.3 BESS

- Quarterly inspections of power conversion system units, heating, ventilation, and air conditioning, battery management system (BMS), and fire suppression systems
- SCADA/BMS remote monitoring for anomalies
- Response procedures tied to EOP protocols for thermal runaway (EOP Section 3.2.1)
- Vegetation management

3.5 Compliance, Controls, and Reporting

The Certificate Holder and BIGL will implement O&M practices that support compliance with applicable regulatory requirements and Site Certificate conditions. This will include operational controls, oversight procedures, and alignment with supporting plans that address vegetation management, spill prevention, wildfire mitigation, air and water quality, and other environmental and safety considerations.

Compliance measures will be scaled to site activities and updated as operations evolve.

Documentation of inspections, incidents, and maintenance activities will be maintained. Reporting will follow applicable requirements and timeframes outlined in the Site Certificate and coordinating agency permits.

This section will be updated in the final O&M Plan to reflect specific commitments based on Site Certificate conditions and reporting requirements identified by ODOE and coordinating agencies. The final version will define required reporting content, frequencies, responsible parties, and coordination procedures to demonstrate ongoing compliance.

3.6 Emergency Preparedness Integration

The Certificate Holder will take the following actions to address emergency preparedness:

- Inspect and test all safety equipment.
- Review and update the EOP regularly, and ensure all personnel are fully trained in emergency response.
- Perform all Spill Prevention, Control, and Countermeasure Plan requirements, including maintaining spill kits.
- Develop and maintain a Hazardous Materials Management Plan if required by state or federal regulations.
- If applicable, prepare and maintain an Emergency Planning and Community Right-to-Know Act (EPCRA) Tier I or II form, plus a list and quantities of chemicals that exceed reporting thresholds for EPCRA Tier 2.

- Conduct an audit that includes a review of site compliance with the facility's safety program and onsite observation for proper implementation of safety policies, including Lock Out-Tag Out, and a review of the facility's safety program and any recommended revisions.
- Perform a root cause analysis, corrective actions taken, and recommended corrective work related to injuries or illness requiring medical attention other than first aid, injuries or illness requiring restricted duty or days away from work, or a fatality.
- Notify the operator as soon as possible, not to exceed 1 hour, of any of the following events:
 - 1) Emergency responders contacted for an emergency or law enforcement response.
 - 2) Injury on site requiring medical attention more than first aid.
 - 3) Unplanned outage of one or more medium-voltage (MV) collection or high-voltage circuits.
 - 4) Onsite fire.
 - 5) Conditions that necessitate an evacuation of onsite personnel.
 - 6) Awareness of an impending weather event that has a reasonable probability of causing significant damage or any of the preceding 1) through 5) events.

3.7 Contractor and Staff Oversight

BrightNight, on behalf of PGE, will oversee and facilitate the O&M of the BCWF Solar and BESS Components with an O&M service provider experienced in operating and maintaining large-scale PV solar systems and balance-of-plant systems for a large-scale BESS. There will be a long-term service agreement with the BESS supplier. The O&M service provider will be responsible for the operation of the Solar Components, maintenance of the Facility up to the point of interconnection, and maintenance of equipment/circuits from the BESS inverter alternating current output terminals to the point of interconnection. The O&M service provider's scope will cover equipment, including the PV array, PV system inverters, low-voltage cables, MV transformers (including auxiliary transformers), MV feeders, MV switchgear, site meters, and the O&M building equipment.

4.0 Long-term Maintenance and Operational Continuity

To support the operational life of the Solar Components, the Certificate Holder has developed a long-term maintenance and operations framework that evolves over time and ensures continuous compliance with site certificate conditions.

Years 1–5: BIGL will lead O&M management under the Build Transfer Agreement. BIGL's scope will include preventive maintenance scheduling and vendor oversight.

Post-Year 5: PGE will assume full O&M responsibilities, integrating solar and BESS oversight into its internal asset management systems. This transition will be guided by a detailed handover plan including training, document transfer, and performance reviews conducted in Year 4.

Continuity of Practice: Regardless of ownership stage, O&M will be conducted in accordance with procedures established in this document, including vendor management,

EOP training, and incident reporting protocols. Performance metrics and component reliability will be tracked in PGE's asset management software and reviewed annually.

4.1 Personnel and Quality Assurance Oversight

The Amended BCWF will be supported by experienced operations personnel through all phases of its operating life.

Operations Roles:

- SCADA/Performance Analyst
- Field Technician Team (PV/BESS certified)
- Asset Manager (PGE)
- QA/QC Lead (during and post-handoff)

Quality Assurance Protocols:

- Annual third-party condition assessments (PV and BESS)
- Annual SCADA data audit for performance anomalies
- Compliance inspections linked to EOP protocols
- Maintenance records retained and reviewed for trends

4.2 Budget Planning and Lifecycle Management

PGE will incorporate the solar and BESS components into its existing capital planning processes. The following measures support financial assurance and long-term reliability:

- Maintenance Budgeting:
 - O&M budgets for the first 5 years are embedded in the Build Transfer Agreement.
 - Post-transfer, expenses are forecasted annually by the Asset Management Team and tracked against site-specific performance.
- Lifecycle Planning:
 - A major maintenance reserve will be included in financial modeling to support inverter replacement, battery module refresh (anticipated at 12–15 years), and other long-term needs.
 - PGE's decommissioning cost estimates (Exhibit X) will be updated every 5 years to reflect equipment aging and market conditions.

5.0 Conclusions

The Certificate Holder recognizes that the integration of solar and battery components at the Amended BCWF presents new operational considerations. Drawing on extensive experience at Biglow Canyon, the Certificate Holder is committed to applying industry best practices, continuous improvement, and rigorous compliance oversight to ensure safe, reliable, and environmentally responsible operation of the Amended BCWF.

Attachment 5. Exhibits