Request for Amendment 5 for the Biglow Canyon Wind Farm

Exhibit O. State and Local Laws and Regulations

Part 1. Wetlands and Other Jurisdictional Waters

Submitted to
Oregon Energy Facility Siting Council

Prepared for

Portland General Electric Company

Prepared by

TETRA TECH

October 2026

Table of Contents

1.0 Introduction 1
2.0 Wetlands and Other Jurisdictional Waters – OAR 345-022-0160(1)(a) 2
2.1 Surveys – OAR 345-022-0160(1)(a)(A) 2
2.1.1 Definitions 2
2.1.2 Delineation Methods 3
2.1.3 Delineation Results 4
2.2 Effects on Waters of the State – OAR 345-022-0160(1)(a)(B) 4
2.3 Significance of Impacts – OAR 345-022-0160(1)(a)(C) 4
2.4 Removal-Fill Information – OAR 345-022-0160(1)(a)(D)(E) 4
2.5 Mitigation and Monitoring Program for Waters of the State – OAR 345-022-0160(1)(a)(F) 4
3.0 References 5
4.0 Approval Standards and Submittal Requirements 5

List of Tables

Table O1-1. Approval Standards and Submittal Requirements Matrix 5

List of Figures

Figure O1-1. Delineated Wetlands and Waters

List of Attachments

Attachment O1-1. Wetland Delineation Report

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
Council or EFSC	Energy Facility Siting Council
gen-tie	generation tie
kV	kilovolt
MW	megawatt
MWh	megawatt-hour
OAR	Oregon Administrative Rules
ODOE	Oregon Department of Energy
ODSL	Oregon Department of State Lands
ORS	Oregon Revised Statutes
PV	photovoltaic
RFA	Request for Amendment
SDAM	Streamflow Duration Assessment Method for the Pacific Northwest
Site Certificate	Site Certificate on Amendment 4
Solar Facility	solar energy generation and battery storage components
WOTUS	waters of the United States

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 (together, RFA 5 Site Boundary; see Background Exhibit Figure 4).

The RFA 5 Site Boundary 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 information contained herein supports demonstration of compliance with the State and Local Laws and Regulations approval standard for Oregon Administrative Rules (OAR) 345-022-00160.

2.0 Wetlands and Other Jurisdictional Waters – OAR 345-022-0160(1)(a)

OAR 345-022-0160 To assist the Council in determining compliance with all state and local laws and regulations applicable to EFSC and the siting process, submit the following, as directed by the project order described in OAR 345-015-0160:

(1) Regarding Water

(a) Information based on literature and field study, as appropriate, about waters of this state, as defined under ORS 196.800, including:

2.1 Surveys – OAR 345-022-0160(1)(a)(A)

(A) A description of all areas within the site boundary that might be waters of this state and a map showing the location of these features;

The RFA 5 Site Boundary reflects the study area for RFA 5 within the meaning of Oregon Revised Statute (ORS) 345-001-0010(35) (Figure O1-1). Existing land use within the RFA 5 Site Boundary is generally dominated by wheat and carrot seed farming, and the infrastructure needed to manage the existing wind farm (e.g., gravel roads). All permanent and temporary disturbances associated with RFA 5 are proposed within the RFA 5 Site Boundary; however, not all of this area will be disturbed.

A wetland delineation survey was conducted in July 2024 by Tetra Tech ahead of submitting RFA 4. The wetland study area for this survey included areas that are now the RFA 5 Site Boundary. The wetland delineation report that was produced after this survey and submitted to the Oregon Department of State Lands (ODSL) as Wetland Delineation Report WD #2025-0012 is attached to this exhibit as Attachment O1-1.

2.1.1 Definitions

2.1.1.1 State

ORS 196.800(15) defines "Waters of the State" as:

> *All natural waterways, tidal and non-tidal bays, intermittent streams, constantly flowing streams, lakes, wetlands, that portion of the Pacific Ocean that is in the boundaries of this state, all other navigable and non-navigable bodies of water in this state and those portions of the ocean shore, as defined in ORS 390.605, where removal or fill activities are regulated under a state-assumed permit program as provided in 33 United States Code 1344(g) of the Federal Water Pollution Control Act, as amended.*

Wetlands are defined in ORS 196.800(17) as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." The ODSL definition of wetlands mirrors the federal definition; see OAR 141-085-0510 (110).

2.1.1.2 Jurisdictional Versus Non-Jurisdictional Waters

Not all wetlands and streams are within the jurisdiction of state or federal regulation, and not all waters falling within the state's jurisdiction fall under federal jurisdiction. For RFA 5, several jurisdictional distinctions are important to estimate impacts only to jurisdictional wetlands and other waters. These include determinations related to the following:

- Ephemeral streams, which generally are not under state jurisdiction and are evaluated on a case-by-case basis for federal jurisdiction, as distinct from perennial and intermittent (USACE 2005, USACE 2008); and
- Artificially created roadside and farm ditches, which are considered waters of the State if they contain food or game fish and are connected to waters of the State (OAR 141-085-0515(8)) and waters of the United States (WOTUS) if they connect to other WOTUS and are not ephemeral (EPA and USACE 2011).

Ephemeral streams are defined in the Streamflow Duration Assessment Method for the Pacific Northwest (SDAM; Nadeau 2015) as streams that flow:

> *…only in direct response to precipitation. Water typically flows only during and shortly after large precipitation events. An ephemeral stream may or may not have a well-defined channel, the stream bed is always above the water table, and stormwater runoff is the primary source of water. An ephemeral stream typically lacks biological, hydrological, and physical characteristics commonly associated with the continuous or intermittent conveyance of water).*

In contrast, intermittent streams are defined by Oregon as "any stream which flows during a portion of every year and which provides spawning, rearing or food-producing areas for food and game fish" (OAR 141-085-0510(49)). Food-producing streams are typically one stream order above a fish-bearing stream.

While the term "jurisdictional waters" is used in this Exhibit, the Certificate Holder recognizes that final determination of agency jurisdiction will be made by ODSL, based on the information presented by the Certificate Holder.

2.1.2 Delineation Methods

Field investigations for the delineation of wetlands and other waters within the wetland study area were conducted by Tetra Tech from July 9 to 12, 2024. Detailed descriptions of delineation methods for wetlands and other waters are provided in the Wetland and Other Waters Delineation Report

(Attachment O1-1). This report was submitted to ODSL as Wetland Delineation Report WD #2025-0012 and received concurrence.

2.1.3 Delineation Results

The wetland and other waters surveys resulted in no wetlands or water features being identified within the RFA 5 Site Boundary. Per the definitions under OAR 141-085-0510 and OAR 141-085-0515, no jurisdictional features are present within the RFA 5 Site Boundary (Figure O-1.1).

2.2 Effects on Waters of the State – OAR 345-022-0160(1)(a)(B)

> *(B) An analysis of whether construction or operation of the proposed facility would adversely affect any waters of this state;*

Since no wetlands or water features are present within the RFA 5 Site Boundary, no impacts are expected to any waters of this State.

2.3 Significance of Impacts – OAR 345-022-0160(1)(a)(C)

> *(C) A description of the significance of potential adverse impacts to each feature identified in (A), including the nature and amount of material the applicant would remove from or place in the waters analyzed in (B);*

Since no wetlands or water features are present within the RFA 5 Site Boundary, no impacts are expected to any waters of this State.

2.4 Removal-Fill Information – OAR 345-022-0160(1)(a)(D)(E)

> *(D) If the proposed facility would not need a removal-fill authorization, an explanation of why no such authorization is required for the construction and operation of the proposed facility;*
>
> *(E) If the proposed facility would need a removal-fill authorization, information to support a determination by the Council that the Oregon Department of State Lands should issue a removal-fill permit, including information in the form required by the Department of State Lands under OAR Chapter 141 Division 85; and*

Since no wetlands or water features are present within the RFA 5 Site Boundary, remove-fill authorization is not anticipated to be needed.

2.5 Mitigation and Monitoring Program for Waters of the State – OAR 345-022-0160(1)(a)(F)

> *(F) A description of proposed actions to mitigate adverse impacts to the features identified in (A) and the applicant's proposed monitoring program, if any, for such impacts.*

Since no wetlands or water features are present within the RFA 5 Site Boundary, no mitigation or monitoring program is required.

3.0 References

EPA (U.S. Environmental Protection Agency) and USACE (U.S. Army Corps of Engineers). 2011. Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States. http://www.epa.gov/owow/wetlands/pdf/RapanosGuidance6507.pdf

Nadeau, Tracie-Lynn. 2015. Streamflow Duration Assessment Method for the Pacific Northwest. EPA 910-K-14-001, U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

USACE (U.S. Army Corps of Engineers). 2005. Regulatory Guidance Letter (RGL) 05-05 Ordinary High Water Mark Identification. December 2005.

USACE. 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0). ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-08-28. Vicksburg, Mississippi: U.S. Army Engineer Research and Development Center. https://usace.contentdm.oclc.org/utils/getfile/collection/p266001coll1/id/7627

4.0 Approval Standards and Submittal Requirements

Table O1-1. Approval Standards and Submittal Requirements Matrix

Requirements	Location
OAR 345-022-0160 State and Local Laws and Regulations	–
Submittal Requirements	
To assist the Council in determining compliance with all state and local laws and regulations applicable to EFSC and the siting process, submit the following, as directed by the project order described in OAR 345-015-0160:	–
(1) Regarding Water	–
(a) Information based on literature and field study, as appropriate, about waters of this state, as defined under ORS 196.800, including:	Section 2.0
(A) A description of all areas within the site boundary that might be waters of this state and a map showing the location of these features;	Section 2.1
(B) An analysis of whether construction or operation of the proposed facility would adversely affect any waters of this state;	Section 2.2
(C) A description of the significance of potential adverse impacts to each feature identified in (A), including the nature and amount of material the applicant would remove from or place in the waters analyzed in (B);	Section 2.3
(D) If the proposed facility would not need a removal-fill authorization, an explanation of why no such authorization is required for the construction and operation of the proposed facility;	Section 2.4

Requirements	Location
(E) If the proposed facility would need a removal-fill authorization, information to support a determination by the Council that the Oregon Department of State Lands should issue a removal-fill permit, including information in the form required by the Department of State Lands under OAR Chapter 141 Division 85; and	Section 2.4
(F) A description of proposed actions to mitigate adverse impacts to the features identified in (A) and the applicant's proposed monitoring program, if any, for such impacts.	Section 2.5

Figures

Biglow Canyon Wind Farm Request for Amendment #5

Figure O1-1 Delineated Wetlands and Waters

SHERMAN COUNTY, OR

Sherman County

- RFA5 Site Boundary
- State Boundary
- County Boundary
- City/Town
- Exclusion Zone

Field Delineated Wetlands (Cowardin; HGM)

- PEM; Flats

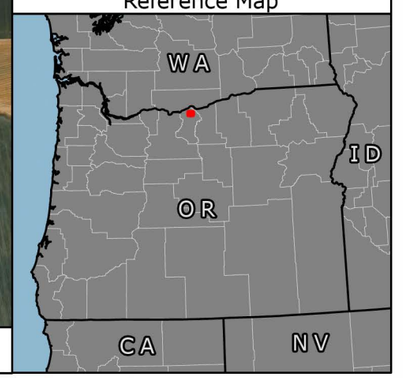
Impacts

- Temporary
- Permanent

TETRA TECH

PGE

Reference Map



1:25,000

WGS 1984 UTM Zone 10N

0 1 2 Miles

NOT FOR CONSTRUCTION

\\tt.local\GIS\US\CES\Projects\PDX\BrightNight\BiglowCanyon\Maps_RFA5\Exhibit_O\PGE_BiglowCanyon_RFA5_EXHIBIT_O_20260803.aprx

Attachment O1-1. Wetland Delineation Report

Oregon
Tina Kotek, Governor

Department of State Lands
775 Summer Street NE, Suite 100
Salem, OR 97301-1279
(503) 986-5200
FAX (503) 378-4844
www.oregon.gov/dsl

State Land Board

Tina Kotek
Governor

Tobias Read
Secretary of State

Elizabeth Steiner
State Treasurer

August 12, 2025

BIGL bn, LLC
Attention: Todd Ellwood

Re: WD # 2025-0012 **Approved**
Wetland Delineation Report for Biglow Canyon Wind Farm
Sherman County; Many Tax Lots, See Table Below

Dear Todd Ellwood:

The Department of State Lands has reviewed the wetland delineation report prepared by Tetra Tech Inc for the site referenced above. Please note that the study area includes only a portion of the tax lots described in the table (see the attached maps). Based upon the information presented in the report, and additional information submitted upon request, we concur with the wetland and waterway boundaries as mapped in Figure 5 and 5.1 – 5.28 of the report. Please replace all copies of the preliminary wetland maps with these final Department-approved maps.

Within the study area, three wetlands (WT01 through WT03) and four waterways (ST01 through ST04) were identified. Wetlands WT03 (totaling approximately 4.21 acres) and ST04 are subject to the permit requirements of the state Removal-Fill Law. Under current regulations, a state permit is required for cumulative fill or annual excavation of 50 cubic yards or more in wetlands or below the ordinary high-water line (OHWL) of the waterway (or the 2-year recurrence interval flood elevation if OHWL cannot be determined).

Wetlands WT01 and WT02 and the ephemeral streams (ST01, ST02, and ST03) are exempt per OAR 141-085-0515(6) and -0510(67); therefore, are not subject to current state Removal-Fill requirements.

This concurrence is for purposes of the state Removal-Fill Law only. We recommend that you attach a copy of this concurrence letter to any subsequent state permit application to speed application review. Federal, other state agencies or local permit requirements may apply as well. The U.S. Army Corps of Engineers will determine jurisdiction under the Clean Water Act, which may require submittal of a complete Wetland Delineation Report.

Please be advised that state law establishes a preference for avoidance of impacts to waters of this state. Because measures to avoid and minimize impacts to waters of this state may include reconfiguring parcel layout and size or development design, we recommend that you work with Department staff on appropriate site design before completing the city or county land use approval process.

This concurrence is based on information provided to the agency. The jurisdictional determination is valid for five years from the date of this letter unless new information necessitates a revision. Circumstances under which the Department may change a determination are found in OAR 141-090-0045 (available on our web site or upon request). In addition, laws enacted by the legislature and/or rules adopted by the Department may result in a change in jurisdiction; individuals and applicants are subject to the regulations that are in effect at the time of the removal-fill activity or complete permit application. The applicant, landowner, or agent may submit a request for reconsideration of this determination in writing within six months of the date of this letter.

Thank you for having the site evaluated. If you have any questions, please contact the Wetland Ecologist, Trevor Griffiths, at (971) 375-8886.

Sincerely,

Daniel Evans

Digitally signed by Daniel Evans
Date: 2025.08.15 10:38:28 -07'00'

Daniel Evans, PWS
Wetland Ecology Specialist

Enclosures

ec: Katie Pyne, Tetra Tech Inc.
Sherman County Planning Department
Corps of Engineers
Richard Fitzgerald, DSL
Joy Lovett, ODFW

WETLAND DELINEATION / DETERMINATION REPORT COVER FORM

A complete report and signed report cover form, along with applicable review fee, are required before a report review timeline can be initiated by the Department of State Lands. All applicants will receive an emailed confirmation that includes the report's unique file number and other information.

Ways to submit report:

- **Under 50MB** - A single unlocked PDF can be emailed to: wetland.delineation@dsl.oregon.gov.
- **50MB or larger** - A single unlocked PDF can be uploaded to DSL's Box.com website. After upload notify DSL by email at: wetland.delineation@dsl.oregon.gov.
- OR a hard copy of the unbound report and signed cover form can be mailed to: Oregon Department of State Lands, 775 Summer Street NE, Suite 100, Salem, OR 97301-1279.

Ways to pay review fee:

- By credit card on DSL's epayment portal after receiving the unique file number from DSL's emailed confirmation.
- By check payable to the Oregon Department of State Lands attached to the unbound mailed hardcopy OR attached to the complete signed cover form if report submitted electronically.

Contact and Authorization Information

☒ Applicant ☐ Owner Name, Firm and Address:
BIGL bn, LLC (subsidiary of BrightNight, LLC)
Attention: Todd Ellwood, Senior Director Permitting

Business phone # (850) 963-6011
Mobile phone # (optional)
E-mail: todd.ellwood@brightnightpower.com

☐ Authorized Legal Agent, Name and Address (if different):

Business phone #
Mobile phone # (optional)
E-mail:

I either own the property described below or I have legal authority to allow access to the property. I authorize the Department to access the property for the purpose of confirming the information in the report, after prior notification to the primary contact.

Typed/Printed Name: Todd Ellwood **Signature:** Todd Ellwood Digitally signed by Todd Ellwood Date: 2025.01.09 14:28:30 -08'00'

Date: 01/09/2025 Special instructions regarding site access: _____

Project and Site Information

Project Name: Biglow Canyon Wind Farm

Latitude: 45.642280 Longitude: 120.607011
decimal degree - centroid of site or start & end points of linear project

Proposed Use:
Solar energy generation and battery storage at existing wind farm

Tax Map # -
Tax Lot(s) See report

Tax Map # -
Tax Lot(s) See report

Project Street Address (or other descriptive location):
2.5 miles northeast of Wasco

Township 02N Range 18E Section 19 QQ
Use separate sheet for additional tax and location information

City: Wasco County: Sherman

Waterway: N/A River Mile: N/A

Wetland Delineation Information

Wetland Consultant Name, Firm and Address:
Katie Pyne, Tetra Tech Inc
19803 North Creek Parkway
Bothell, WA 98011

Phone # -
Mobile phone # (if applicable) (425) 273-3098
E-mail: katie.pyne@tetratech.com

The information and conclusions on this form and in the attached report are true and correct to the best of my knowledge.

Consultant Signature: Katie Pyne Digitally signed by Katie Pyne Date: 2025.01.10 10:41:39 -08'00' Date: 01/10/2025

Primary Contact for report review and site access is ☒ Consultant ☐ Applicant/Owner ☐ Authorized Agent

Wetland/Waters Present? ☒ Yes ☐ No Study Area size: 3980 acres Total Wetland Acreage: 4.5800

Check Applicable Boxes Below

☐ R-F permit application submitted
☐ Mitigation bank site
☒ EFSC/ODOE Proj. Mgr: Christopher Clark
☐ Wetland restoration/enhancement project (not mitigation)
☐ Previous delineation/application on parcel
If known, previous DSL # _____

☐ Fee payment submitted **$** _____
☐ Resubmittal of rejected report ($100)
☐ Request for Reissuance. See eligibility criteria. (no fee)
DSL # _____ Expiration date_____
☐ LWI shows wetlands or waters on parcel
Wetland ID code _____

For Office Use Only

DSL Reviewer: JS Fee Paid Date: ____ / ____ / ____ DSL WD # 2025-0012

Date Delineation Received: 1 / 10 / 25 DSL App.# _____

Table 1. Tax Lot Numbers within the Study Area

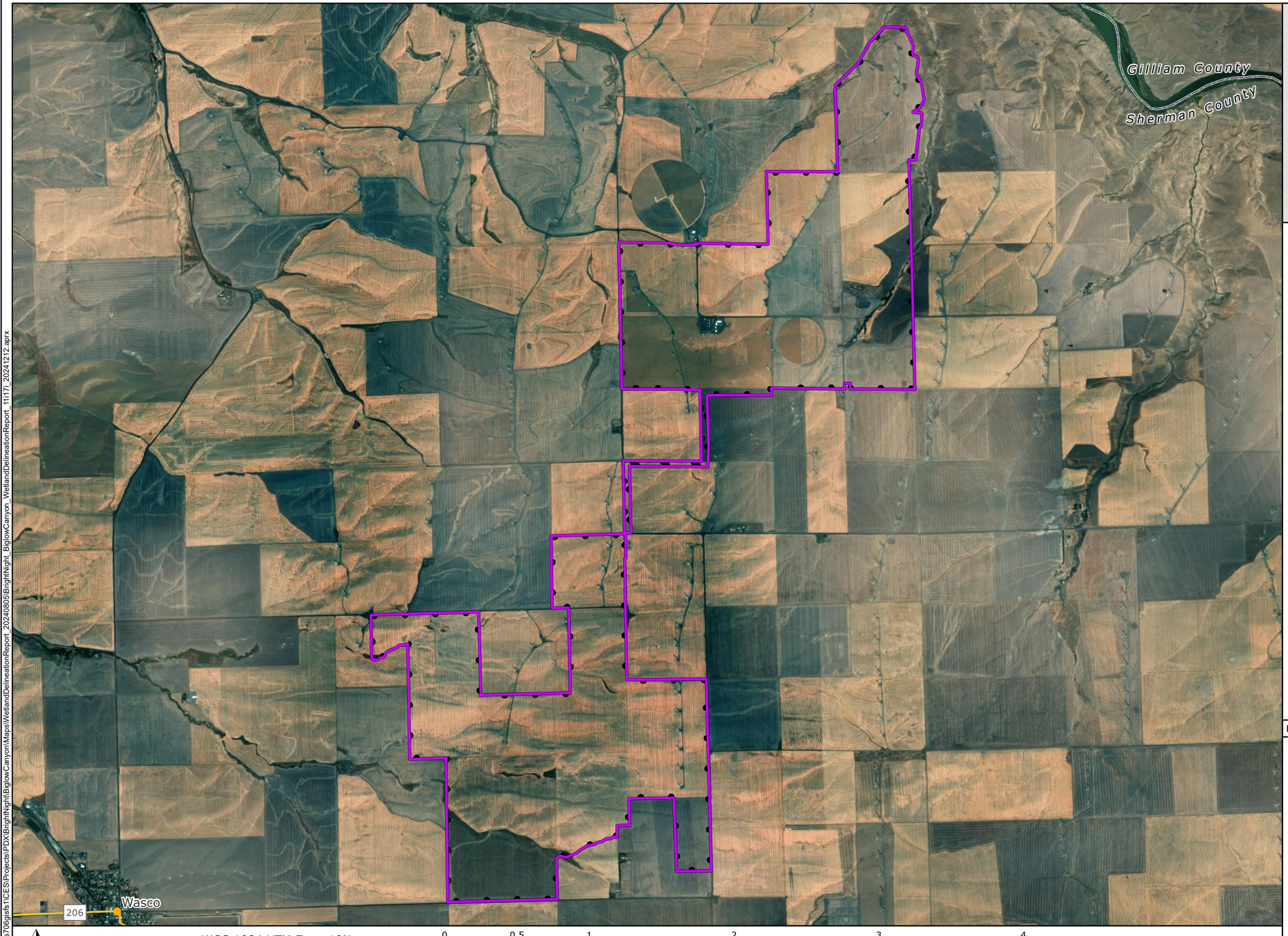
Tax Lot Number	
01N170000100	02N1700008201
01N170000200	02N1700008300
02N1700005100	01N1800001600
02N1700008100	01N1800001601
02N1700008200	02N1800003800
02N1800003900	02N1800004000
02N1800004200	02N1800004300
02N1800004400	02N1800004500
02N1800001600	02N1800001700
02N1800007600	02N1800007900

Wetlands Mapped in the Project Study Area

Wetland Name	Cowardin Classification	HGM	Acres	General Conditions
WT01	Palustrine Emergent	Depressional Closed Nonpermanent	0.15	Relatively flat topography at bottom of basin vegetated with dense stand of *Hordeum jubatum*. No standing water and soils were dry but had redox.
WT02	Palustrine Emergent	Depressional Closed Nonpermanent	0.22	Pond with wetland vegetation (*Myriophyllum verticillatum*) across water surface and *Phragmites australis* and *Schoenoplectus acutus* at edges.
WT03	Riverine Streambed	Riverine Flow Through	4.21	Wetland has riparian canopy made up of silver maple, walnut, and black locust in some locations but is mostly vegetated by reed canary grass (*Phalaris arundinacea*) and speedwell (*Veronica americana*).

Waters Mapped in the Project Study Area

Wetland Name	Duration	Length (ft)	Average Width (ft)	General Conditions
ST01	Ephemeral	133	2	Dry ephemeral drainage full of upland vegetation and weeds. Appears to have been used as a trash dump.
ST02	Ephemeral	113	2	Dry ephemeral drainage full of upland vegetation and weeds, including intermediate wheatgrass, cheatgrass, and Russian thistle.
ST03	Ephemeral	331	2	Dry ephemeral drainage full of upland vegetation and weeds including, intermediate wheatgrass, cheatgrass, and Russian thistle.
ST04	Intermittent	2487	3	Delineated using desktop imagery due to access issues. Surveyors could see the stream from the canyon edge and determined that it is intermittent. Narrow and has sagebrush in the riparian area.



Biglow Canyon Wind Farm Request for Amendment 4

Figure 1
Project Location

SHERMAN COUNTY, OR

- Solar Micrositing Area
- Survey Area
- City/Town
- County Boundary
- State Highway

TETRA TECH

BRIGHTNIGHT
Power when you need it

Data Sources	Reference Map
BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Topographic	

1:40,000

WGS 1984 UTM Zone 10N

0 0.5 1 2 3 4 Miles

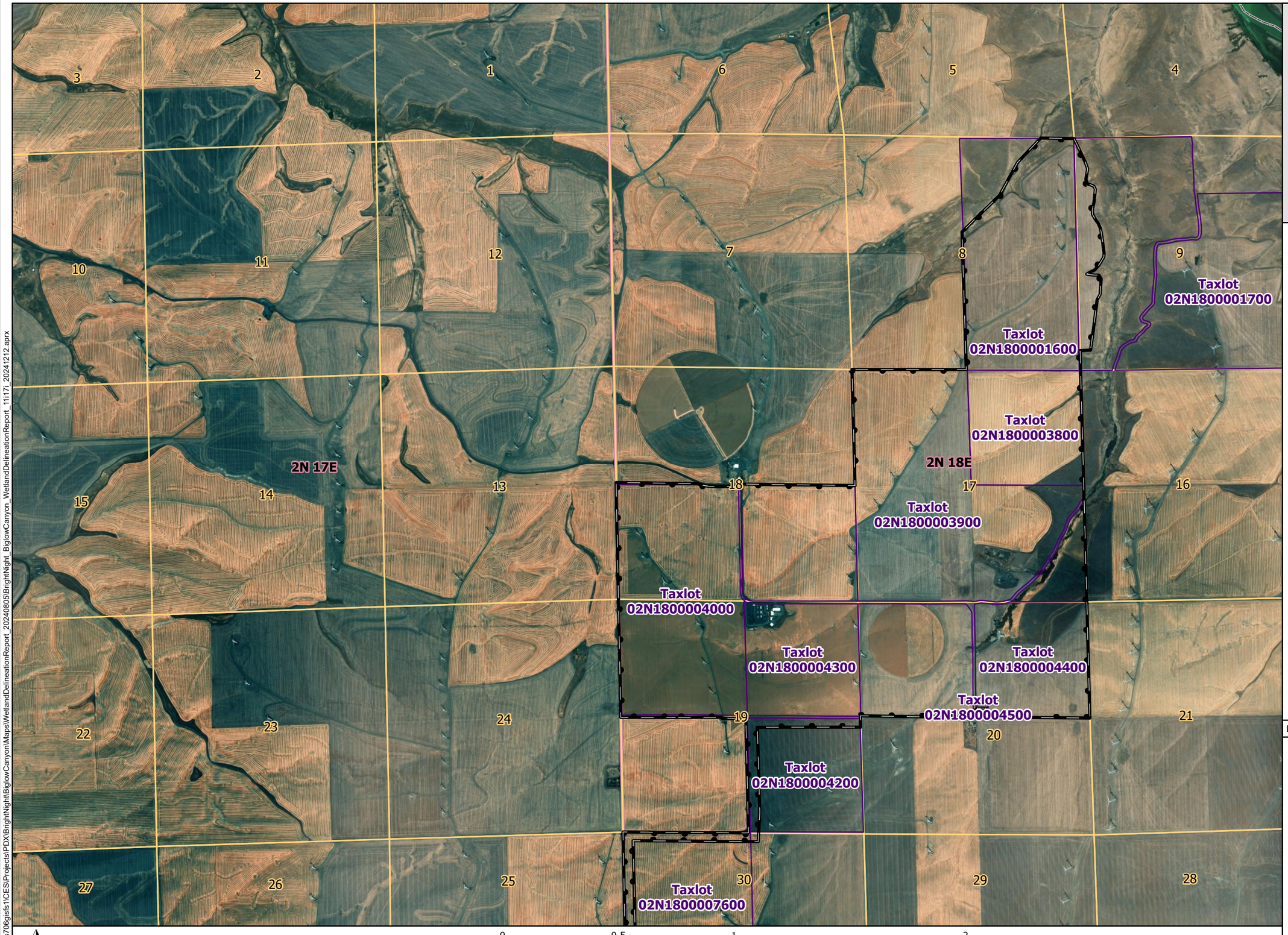
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Biglow Canyon Wind Farm Request for Amendment 4

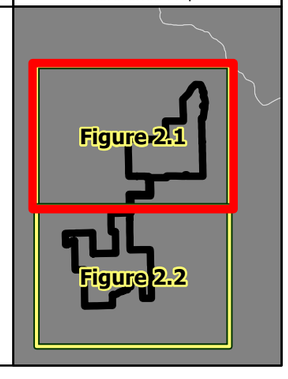
Figure 2.1
Tax Lot Detail Map

SHERMAN COUNTY, OR



- Study Area
- Taxlot Boundary
- Section
- Township
- County Boundary

TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources	Reference Map
BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial; Sherman County-Taxlots	

1:25,000 WGS 1984 UTM Zone 10N 0 0.5 1 2 Miles NOT FOR CONSTRUCTION

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 2.2
Tax Lot Detail Map

SHERMAN COUNTY, OR

Taxlot 02N1800007600
Taxlot 02N1700005100
Taxlot 02N1700008201
Taxlot 02N1700008100
Taxlot 02N1700008300
Taxlot 02N1700008200
Taxlot 02N1800007900
Taxlot 01N1800001600
Taxlot 01N170000200
Taxlot 01N170000100
Taxlot 01N1800001601
2N 17E
2N 18E
1N 17E
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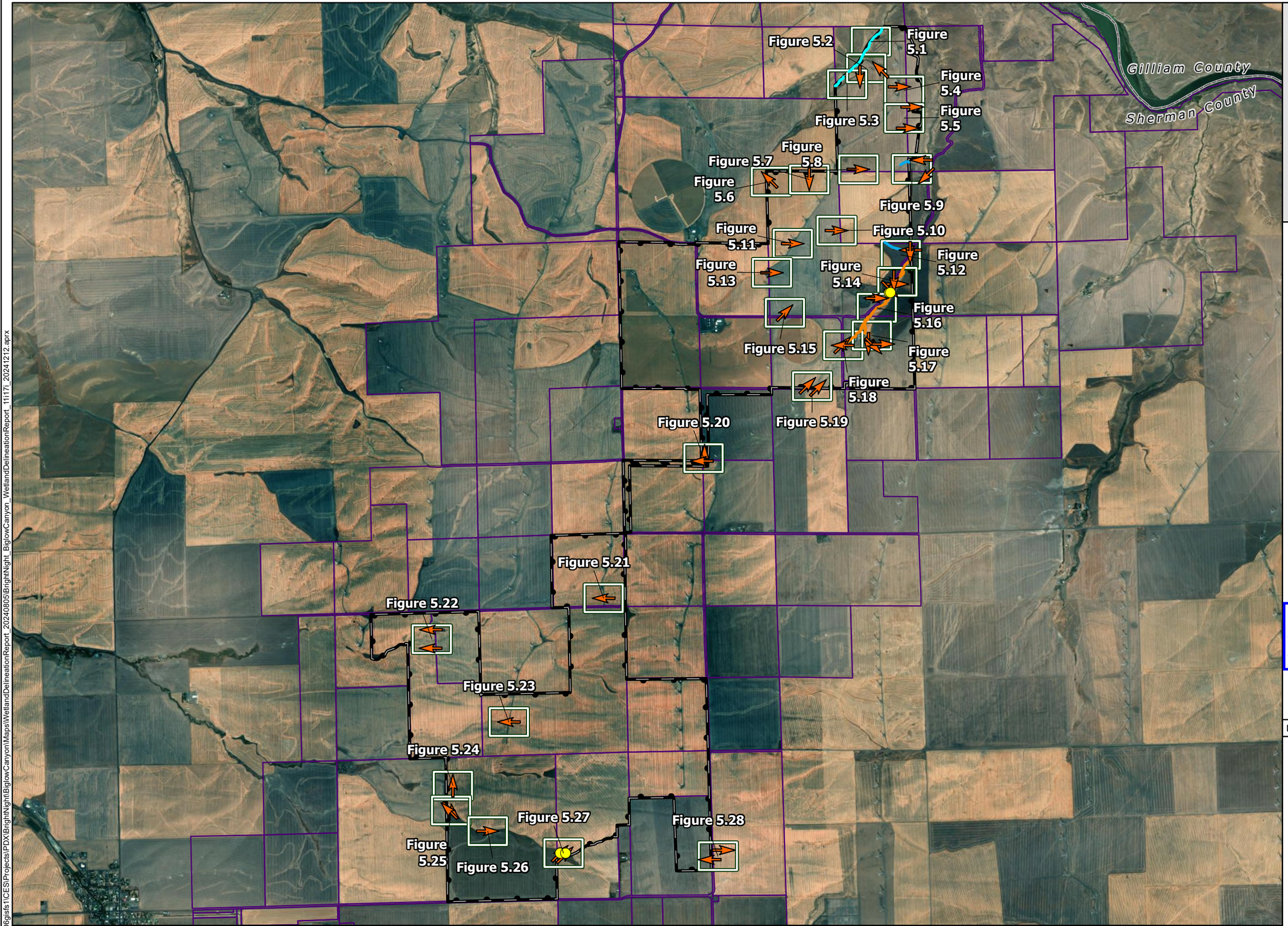
- Study Area
- Taxlot Boundary
- Section
- Township
- County Boundary

TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources	Reference Map
BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial; Sherman County-Taxlots	Figure 2.1, Figure 2.2

1:25,000 WGS 1984 UTM Zone 10N 0 0.5 1 2 Miles NOT FOR CONSTRUCTION

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5
Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

- Map Grid
- Study Area
- Taxlot Boundary
- County Boundary
- Photo Point
- Sample Plot
- Intermittent
- Ephemeral

Field Delineated Wetlands (Cowardin; HGM)

- PEM; Flats
- PSS; Flats

All delineated wetlands and waters are considered to extend outside of the study area unless otherwise noted

Wetland boundaries, sample plots, and photo points were collected using a sub-meter grade GPS device collecting real-time, sub-meter GNSS data. Mapped features are </= 1 meter of the ground location.

DSL WD # 2025-0012
Approval Issued:8/12/2025
Approval Expires:8/12/2030

TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources	Reference Map
BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial	

1:40,000 WGS 1984 UTM Zone 10N 0 0.5 1 2 3 4 Miles

NOT FOR CONSTRUCTION

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.1 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

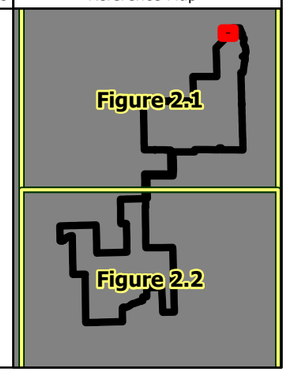
Study Area
Taxlot Boundary
Intermittent

All delineated wetlands and waters are considered to extend outside of the study area unless otherwise noted

Wetland boundaries, sample plots, and photo points were collected using a sub-meter grade GPS device collecting real-time, sub-meter GNSS data. Mapped features are </= 1 meter of the ground location.

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Approval Issued:8/12/2025
Approval Expires:8/12/2030

TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources	Reference Map
BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial	

1:1,200 WGS 1984 UTM Zone 10N 0 125 250 500 US Feet NOT FOR CONSTRUCTION

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.2 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

ST04

Taxlot
02N1800001600

(#1)

(#2)

- Study Area
- Taxlot Boundary
- Photo Point
- Intermittent

All delineated wetlands and waters are considered to extend outside of the study area unless otherwise noted

Wetland boundaries, sample plots, and photo points were collected using a sub-meter grade GPS device collecting real-time, sub-meter GNSS data. Mapped features are </= 1 meter of the ground location.

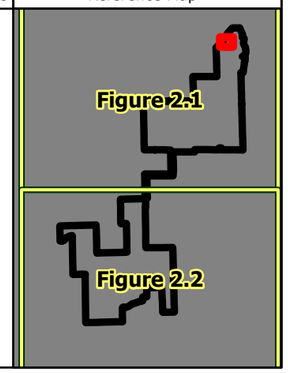
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Approval Expires:8/12/2030

TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources

BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial

Reference Map



1:1,200 WGS 1984 UTM Zone 10N

0 125 250 500 US Feet

NOT FOR CONSTRUCTION

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.3 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

ST04

(#2)

Taxlot
02N1800001500

Taxlot
02N1800001600

- Study Area
- Taxlot Boundary
- Photo Point
- Intermittent

All delineated wetlands and waters are considered to extend outside of the study area unless otherwise noted

Wetland boundaries, sample plots, and photo points were collected using a sub-meter grade GPS device collecting real-time, sub-meter GNSS data. Mapped features are </= 1 meter of the ground location.

DSL WD # 2025-0012
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Approval Expires:8/12/2030

TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources	Reference Map
BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial	Figure 2.1 Figure 2.2

1:1,200 WGS 1984 UTM Zone 10N 0 125 250 500 US Feet

NOT FOR CONSTRUCTION

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.4 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

- Study Area
- Taxlot Boundary
- Photo Point

All delineated wetlands and waters are considered to extend outside of the study area unless otherwise noted

Wetland boundaries, sample plots, and photo points were collected using a sub-meter grade GPS device collecting real-time, sub-meter GNSS data. Mapped features are </= 1 meter of the ground location.

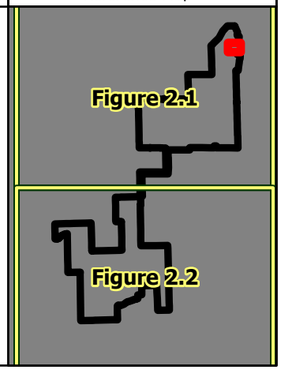
DSL WD # 2025-0012
Approval Issued:8/12/2025
Approval Expires:8/12/2030

TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources

BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial

Reference Map



1:1,200 WGS 1984 UTM Zone 10N

0 125 250 500 US Feet

NOT FOR CONSTRUCTION

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.5 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

Study Area
Taxlot Boundary
Photo Point

All delineated wetlands and waters are considered to extend outside of the study area unless otherwise noted

Wetland boundaries, sample plots, and photo points were collected using a sub-meter grade GPS device collecting real-time, sub-meter GNSS data. Mapped features are </= 1 meter of the ground location.

DSL WD # 2025-0012
Approval Issued:8/12/2025
Approval Expires:8/12/2030

TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources	Reference Map
BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial	Figure 2.1 Figure 2.2

1:1,200 WGS 1984 UTM Zone 10N

0 125 250 500 US Feet

NOT FOR CONSTRUCTION

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.6 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

- Study Area
- Taxlot Boundary
- Photo Point

All delineated wetlands and waters are considered to extend outside of the study area unless otherwise noted

Wetland boundaries, sample plots, and photo points were collected using a sub-meter grade GPS device collecting real-time, sub-meter GNSS data. Mapped features are </= 1 meter of the ground location.

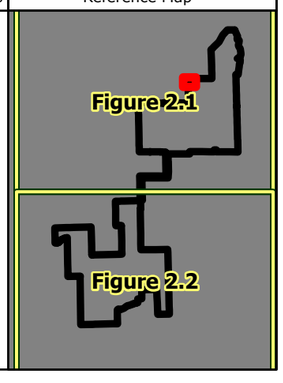
DSL WD # 2025-0012
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Approval Expires:8/12/2030

TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources

BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aenal

Reference Map



1:1,200 WGS 1984 UTM Zone 10N

0 125 250 500 US Feet

NOT FOR CONSTRUCTION

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.7 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

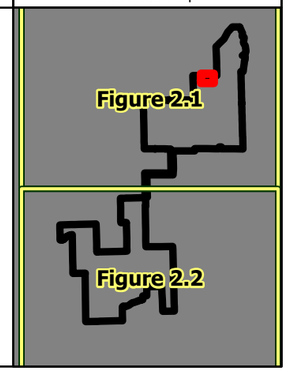
Study Area
Taxlot Boundary
Photo Point

All delineated wetlands and waters are considered to extend outside of the study area unless otherwise noted

Wetland boundaries, sample plots, and photo points were collected using a sub-meter grade GPS device collecting real-time, sub-meter GNSS data. Mapped features are </= 1 meter of the ground location.

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TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources	Reference Map
BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial	

1:1,200 WGS 1984 UTM Zone 10N 0 125 250 500 US Feet NOT FOR CONSTRUCTION

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.8 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

Taxlot
02N1800001600

(#6)

Taxlot
02N1800003800

Study Area
Taxlot Boundary
Photo Point

All delineated wetlands and waters are considered to extend outside of the study area unless otherwise noted

Wetland boundaries, sample plots, and photo points were collected using a sub-meter grade GPS device collecting real-time, sub-meter GNSS data. Mapped features are </= 1 meter of the ground location.

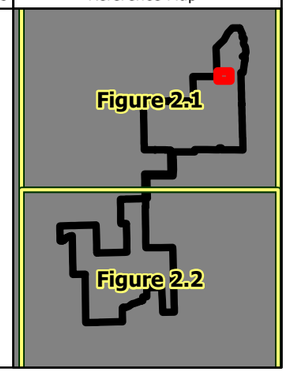
DSL WD # 2025-0012
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TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources

BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial

Reference Map



1:1,200 WGS 1984 UTM Zone 10N

0 125 250 500 US Feet

NOT FOR CONSTRUCTION

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.9 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

ST02

Taxlot
02N1800001600

Taxlot
02N1800001700

(#34)

Taxlot
02N1800003800

Taxlot
02N1800003700

(#33)

Study Area
Taxlot Boundary
Photo Point
Ephemeral

All delineated wetlands and waters are considered to extend outside of the study area unless otherwise noted

Wetland boundaries, sample plots, and photo points were collected using a sub-meter grade GPS device collecting real-time, sub-meter GNSS data. Mapped features are </= 1 meter of the ground location.

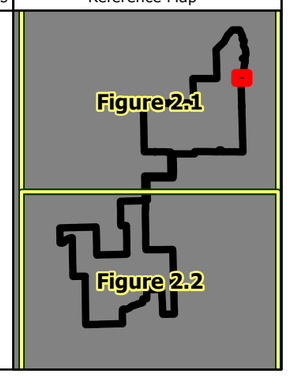
DSL WD # 2025-0012
Approval Issued:8/12/2025
Approval Expires:8/12/2030

TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources

BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial

Reference Map



1:1,200

WGS 1984 UTM Zone 10N

0 125 250 500 US Feet

NOT FOR CONSTRUCTION

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.10 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

Study Area
Taxlot Boundary
Photo Point

All delineated wetlands and waters are considered to extend outside of the study area unless otherwise noted

Wetland boundaries, sample plots, and photo points were collected using a sub-meter grade GPS device collecting real-time, sub-meter GNSS data. Mapped features are </= 1 meter of the ground location.

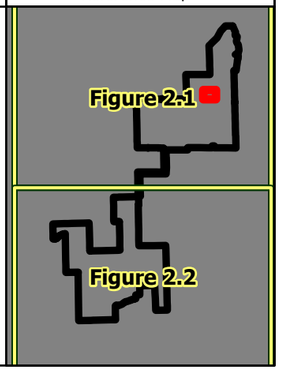
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Approval Issued:8/12/2025
Approval Expires:8/12/2030

TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources

BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial

Reference Map



1:1,200 WGS 1984 UTM Zone 10N

0 125 250 500 US Feet

NOT FOR CONSTRUCTION

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.11 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

Study Area
Taxlot Boundary
Photo Point

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Approval Issued:8/12/2025
Approval Expires:8/12/2030

TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources	Reference Map
BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial	Figure 2.1 Figure 2.2

1:1,200 WGS 1984 UTM Zone 10N 0 125 250 500 US Feet NOT FOR CONSTRUCTION

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.12 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

Taxlot 02N1800003800

Taxlot 02N1800003700

Taxlot 02N1800003900

Taxlot 02N1800003600

ST03

WT03

(#35)

(#36)

- Study Area
- Taxlot Boundary
- Photo Point
- Ephemeral

Field Delineated Wetlands (Cowardin; HGM)

- PSS; Flats

All delineated wetlands and waters are considered to extend outside of the study area unless otherwise noted

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Approval Issued:8/12/2025
Approval Expires:8/12/2030

TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources	Reference Map
BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial	Figure 2.1; Figure 2.2

1:1,200 WGS 1984 UTM Zone 10N

0 125 250 500 US Feet

NOT FOR CONSTRUCTION

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.13 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

Study Area
Taxlot Boundary
Photo Point

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Wetland boundaries, sample plots, and photo points were collected using a sub-meter grade GPS device collecting real-time, sub-meter GNSS data. Mapped features are </= 1 meter of the ground location.

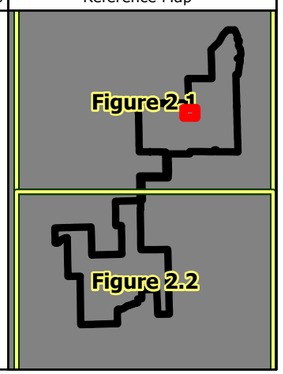
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TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources

BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial

Reference Map



1:1,200 WGS 1984 UTM Zone 10N

0 125 250 500 US Feet

NOT FOR CONSTRUCTION

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.14 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

(#38)
(#37)
(#39)
WT03
WT03A
WT03B
Taxlot 02N1800003600
Taxlot 02N1800003900

- Study Area
- Taxlot Boundary
- Photo Point
- Sample Plot

Field Delineated Wetlands (Cowardin; HGM)

- PSS; Flats

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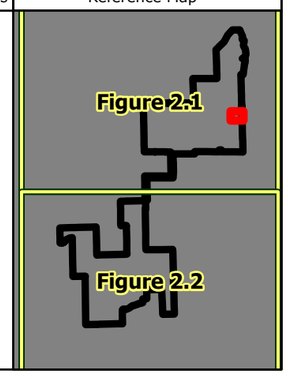
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Approval Expires:8/12/2030

TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources

BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial

Reference Map



1:1,200 WGS 1984 UTM Zone 10N 0 125 250 500 US Feet

NOT FOR CONSTRUCTION

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.15 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

Taxlot 02N1800004000

Taxlot 02N1800003900

(#12)

Taxlot 02N1800004300

Taxlot 02N1800004400

Study Area

Taxlot Boundary

Photo Point

All delineated wetlands and waters are considered to extend outside of the study area unless otherwise noted

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TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources	Reference Map
BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial	Figure 2.1 Figure 2.2

1:1,200 WGS 1984 UTM Zone 10N 0 125 250 500 US Feet

NOT FOR CONSTRUCTION

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.16 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

ST01
(#13)
(#14)
WT03
Taxlot
02N1800003900
Taxlot
02N1800004400

- Study Area
- Taxlot Boundary
- Photo Point
- Ephemeral

Field Delineated Wetlands (Cowardin; HGM)

- PSS; Flats

All delineated wetlands and waters are considered to extend outside of the study area unless otherwise noted

Wetland boundaries, sample plots, and photo points were collected using a sub-meter grade GPS device collecting real-time, sub-meter GNSS data. Mapped features are </= 1 meter of the ground location.

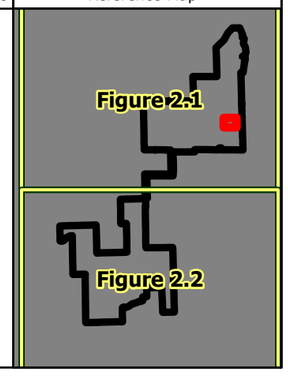
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TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources

BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial

Reference Map



1:1,200 WGS 1984 UTM Zone 10N 0 125 250 500 US Feet

NOT FOR CONSTRUCTION

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.17 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

- Study Area
- Taxlot Boundary
- Photo Point

Field Delineated Wetlands (Cowardin; HGM)

- PSS; Flats

All delineated wetlands and waters are considered to extend outside of the study area unless otherwise noted

Wetland boundaries, sample plots, and photo points were collected using a sub-meter grade GPS device collecting real-time, sub-meter GNSS data. Mapped features are </= 1 meter of the ground location.

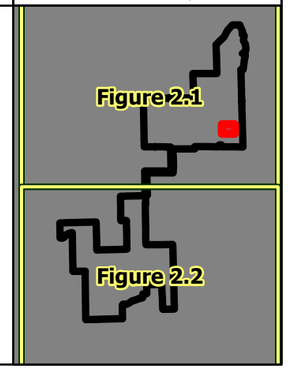
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Approval Expires:8/12/2030

TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources

BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial

Reference Map



1:1,200 WGS 1984 UTM Zone 10N 0 125 250 500 US Feet

NOT FOR CONSTRUCTION

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.18 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

- Study Area
- Taxlot Boundary
- Photo Point

Field Delineated Wetlands (Cowardin; HGM)

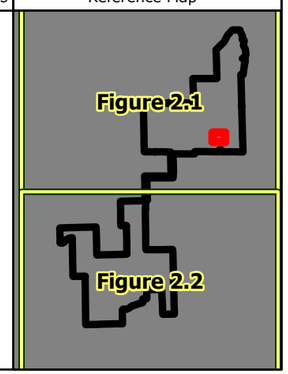
- PSS; Flats

All delineated wetlands and waters are considered to extend outside of the study area unless otherwise noted

Wetland boundaries, sample plots, and photo points were collected using a sub-meter grade GPS device collecting real-time, sub-meter GNSS data. Mapped features are </= 1 meter of the ground location.

DSL WD # 2025-0012
Approval Issued:8/12/2025
Approval Expires:8/12/2030

TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources	Reference Map
BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial	

1:1,200 WGS 1984 UTM Zone 10N

0 125 250 500 US Feet

NOT FOR CONSTRUCTION

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.19 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

Taxlot
02N1800004400

(#19)

(#18)

Taxlot
02N1800004600

Study Area
Taxlot Boundary
Photo Point

All delineated wetlands and waters are considered to extend outside of the study area unless otherwise noted

Wetland boundaries, sample plots, and photo points were collected using a sub-meter grade GPS device collecting real-time, sub-meter GNSS data. Mapped features are </= 1 meter of the ground location.

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Approval Expires:8/12/2030

TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources	Reference Map
BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial	Figure 2.1 Figure 2.2

1:1,200 WGS 1984 UTM Zone 10N

0 125 250 500 US Feet

NOT FOR CONSTRUCTION

\\cess706gisfs1\CES\Projects\PDX\BrightNight\BiglowCanyon\Maps\WetlandDelineationReport_20240805\BrightNight_BiglowCanyon_WetlandDelineationReport_11x17i_20241212.aprx

Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.20 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

Taxlot 02N1800004100

Taxlot 02N1800004200

(#20)

(#21)

Taxlot 02N1800007600

Taxlot 02N1800007500

- Study Area
- Taxlot Boundary
- Photo Point

All delineated wetlands and waters are considered to extend outside of the study area unless otherwise noted

Wetland boundaries, sample plots, and photo points were collected using a sub-meter grade GPS device collecting real-time, sub-meter GNSS data. Mapped features are </= 1 meter of the ground location.

DSL WD # 2025-0012
Approval Issued:8/12/2025
Approval Expires:8/12/2030

TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources	Reference Map
BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial	Figure 2.1 / Figure 2.2

1:1,200 WGS 1984 UTM Zone 10N 0 125 250 500 US Feet

NOT FOR CONSTRUCTION

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.21 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

Taxlot
02N1700005100

(#22)

Taxlot
02N1700008300

- Study Area
- Taxlot Boundary
- Photo Point

All delineated wetlands and waters are considered to extend outside of the study area unless otherwise noted

Wetland boundaries, sample plots, and photo points were collected using a sub-meter grade GPS device collecting real-time, sub-meter GNSS data. Mapped features are </= 1 meter of the ground location.

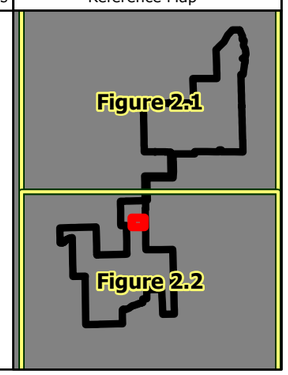
DSL WD # 2025-0012
Approval Issued:8/12/2025
Approval Expires:8/12/2030

TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources

BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial

Reference Map



1:1,200 WGS 1984 UTM Zone 10N

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NOT FOR CONSTRUCTION

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.22 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

(#24)

(#25)

Taxlot 02N1700008200

Taxlot 02N1700008201

Study Area

Taxlot Boundary

Photo Point

All delineated wetlands and waters are considered to extend outside of the study area unless otherwise noted

Wetland boundaries, sample plots, and photo points were collected using a sub-meter grade GPS device collecting real-time, sub-meter GNSS data. Mapped features are </= 1 meter of the ground location.

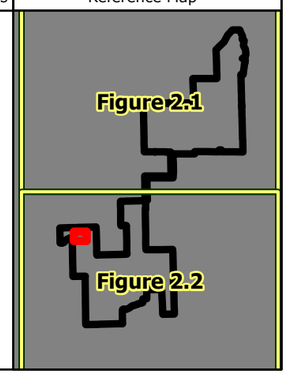
DSL WD # 2025-0012
Approval Issued:8/12/2025
Approval Expires:8/12/2030

TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources

BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial

Reference Map



1:1,200

WGS 1984 UTM Zone 10N

0 125 250 500 US Feet

NOT FOR CONSTRUCTION

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.23 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

Study Area
Taxlot Boundary
Photo Point

All delineated wetlands and waters are considered to extend outside of the study area unless otherwise noted

Wetland boundaries, sample plots, and photo points were collected using a sub-meter grade GPS device collecting real-time, sub-meter GNSS data. Mapped features are </= 1 meter of the ground location.

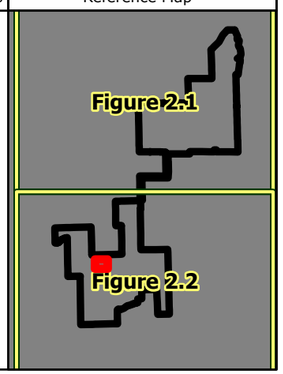
DSL WD # 2025-0012
Approval Issued:8/12/2025
Approval Expires:8/12/2030

TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources

BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial

Reference Map

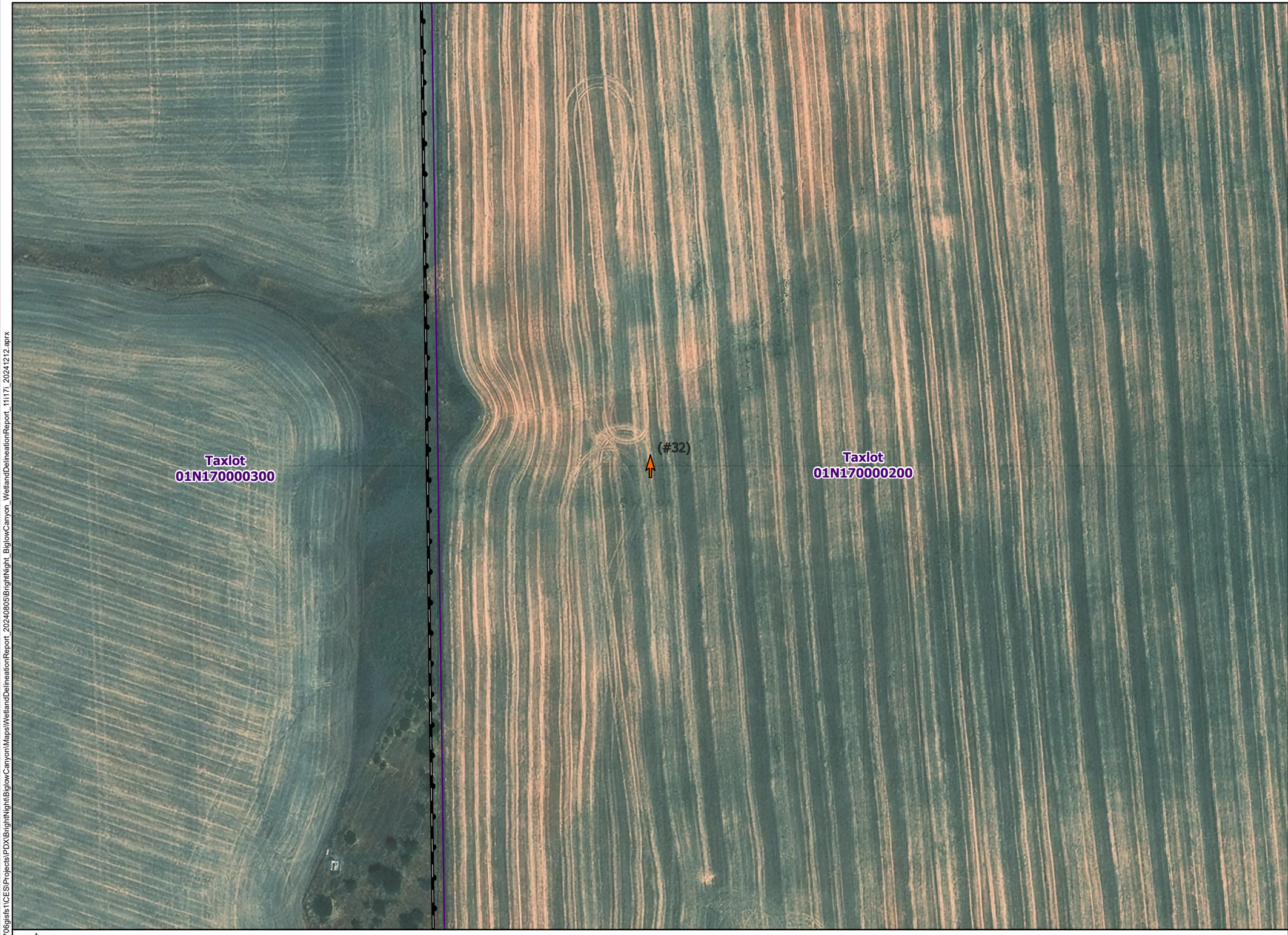


1:1,200 WGS 1984 UTM Zone 10N

0 125 250 500 US Feet

NOT FOR CONSTRUCTION

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.24 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

Study Area
Taxlot Boundary
Photo Point

All delineated wetlands and waters are considered to extend outside of the study area unless otherwise noted

Wetland boundaries, sample plots, and photo points were collected using a sub-meter grade GPS device collecting real-time, sub-meter GNSS data. Mapped features are </= 1 meter of the ground location.

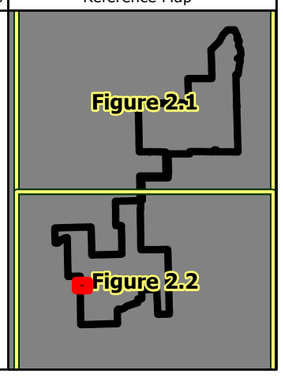
DSL WD # 2025-0012
Approval Issued:8/12/2025
Approval Expires:8/12/2030

TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources

BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial

Reference Map



1:1,200 WGS 1984 UTM Zone 10N

0 125 250 500 US Feet

NOT FOR CONSTRUCTION

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.25 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

Taxlot 01N170000300

Taxlot 01N170000200

(#28)

(#26)

Study Area

Taxlot Boundary

Photo Point

All delineated wetlands and waters are considered to extend outside of the study area unless otherwise noted

Wetland boundaries, sample plots, and photo points were collected using a sub-meter grade GPS device collecting real-time, sub-meter GNSS data. Mapped features are </= 1 meter of the ground location.

DSL WD # 2025-0012
Approval Issued:8/12/2025
Approval Expires:8/12/2030

TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources	Reference Map
BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial	Figure 2.1; Figure 2.2

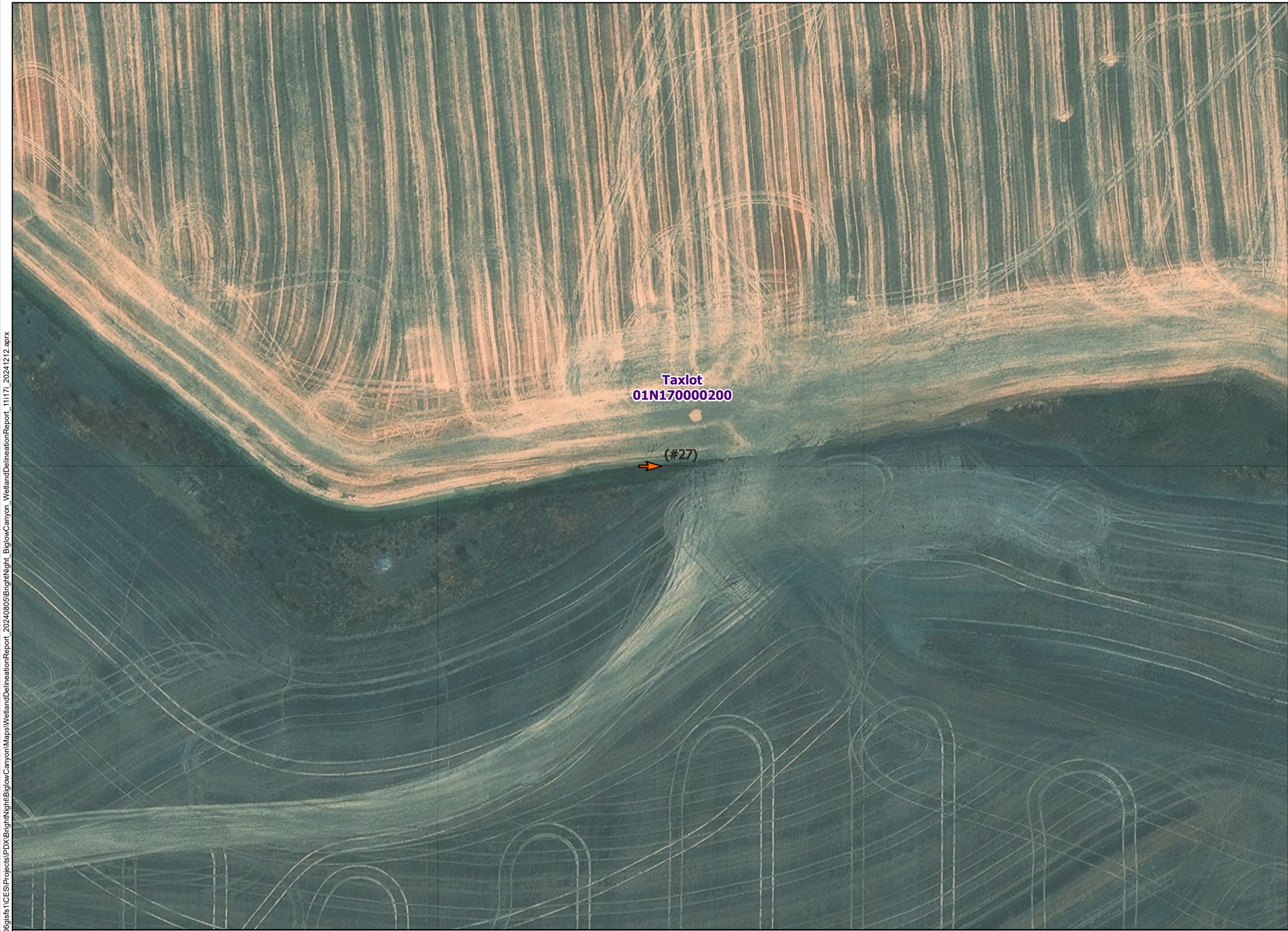
1:1,200 WGS 1984 UTM Zone 10N

0 125 250 500 US Feet

NOT FOR CONSTRUCTION

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.26 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

Study Area
Taxlot Boundary
Photo Point

All delineated wetlands and waters are considered to extend outside of the study area unless otherwise noted

Wetland boundaries, sample plots, and photo points were collected using a sub-meter grade GPS device collecting real-time, sub-meter GNSS data. Mapped features are </= 1 meter of the ground location.

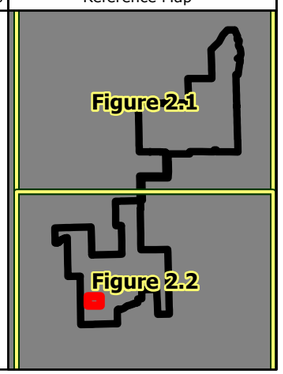
DSL WD # 2025-0012
Approval Issued:8/12/2025
Approval Expires:8/12/2030

TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources

BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial

Reference Map



1:1,200 WGS 1984 UTM Zone 10N 0 125 250 500 US Feet

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.27 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

Taxlot 01N170000200

Taxlot 01N170000100

WT01

WT01A

WT01B

(#30)

WT02

WT02A

WT02B

(#31)

- Study Area
- Taxlot Boundary
- Photo Point
- Sample Plot

Field Delineated Wetlands (Cowardin; HGM)

- PEM; Flats

All delineated wetlands and waters are considered to extend outside of the study area unless otherwise noted

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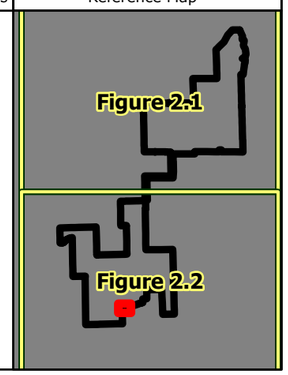
DSL WD # 2025-0012
Approval Issued:8/12/2025
Approval Expires:8/12/2030

TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources

BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial

Reference Map



1:1,200

WGS 1984 UTM Zone 10N

0 125 250 500 US Feet

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Biglow Canyon Wind Farm Request for Amendment 4

Figure 5.28 Wetlands and Waters Delineation Map

SHERMAN COUNTY, OR

- Study Area
- Taxlot Boundary
- Photo Point

All delineated wetlands and waters are considered to extend outside of the study area unless otherwise noted

Wetland boundaries, sample plots, and photo points were collected using a sub-meter grade GPS device collecting real-time, sub-meter GNSS data. Mapped features are </= 1 meter of the ground location.

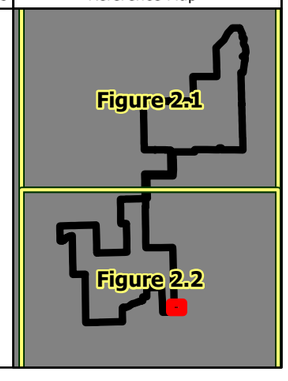
DSL WD # 2025-0012
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Approval Expires:8/12/2030

TETRA TECH BRIGHTNIGHT Power when you need it

Data Sources

BrightNight-Project Infrastructure; Tiger-Roads; ESRI-Aerial

Reference Map



1:1,200 WGS 1984 UTM Zone 10N

0 125 250 500 US Feet

NOT FOR CONSTRUCTION

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Request for Amendment 5 for the Biglow Canyon Wind Farm

Exhibit O. State and Local Laws and Regulations

Part 2. Water Use

Submitted to
Oregon Energy Facility Siting Council

Prepared for



Portland General Electric Company

Prepared by



October 2026

Table of Contents

1.0 Introduction 1
2.0 Description of Water Use – OAR 345-022-0160(1)(b)(A) 2
2.1 Water Use During Construction 2
2.2 Water Use During Operations 4
2.2.1 O&M Buildings 4
2.2.2 Panel Washing 5
2.2.3 Fire Mitigation 5
2.2.4 Total Water Use During Operations 6
3.0 Water Sources – OAR 345-022-0160(1)(b)(B)(C) 6
3.1 Water Sources During Construction 6
3.2 Water Sources During Operations 7
3.3 Water Loss 7
3.3.1 During Construction 7
3.3.2 During Operations 8
4.0 Thermal Power Plants – OAR 345-022-0160(1)(b)(D) 8
5.0 Groundwater Permit Information – OAR 345-022-0160(1)(b)(E)(F) 8
6.0 Water Use Mitigation – OAR 345-022-0160(1)(b)(G) 9
7.0 References 9
8.0 Approval Standards and Submittal Requirements 10

List of Tables

Table O2-1. Water Use During Construction of the RFA 5 Solar Facility 3
Table O2-2. Water Use During Operations Under RFA 4 and RFA 5 Combined 6
Table O2-3. Potential Water Suppliers During Construction 7
Table O2-4. Approval Standards and Submittal Requirements Matrix 10

List of Attachments

Attachment O2-1. Water Source Letters

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 bn, LLC
BMP	best management practice
Certificate Holder or PGE	Portland General Electric Company
Council or EFSC	Energy Facility Siting Council
gen-tie	generation-tie
kV	kilovolt
Mgal	million gallons
MW	megawatt
MWh	megawatt-hour
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and maintenance
OAR	Oregon Administrative Rules
ODEQ	Oregon Department of Environmental Quality
ODOE	Oregon Department of Energy
ORS	Oregon Revised Statutes
PV	photovoltaic
RFA	Request for Amendment
Site Certificate	Site Certificate on Amendment 4
Solar Facility	solar power generation facility
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 (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 5Solar Facility as proposed under RFA 5 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 provides a conservative estimate of the maximum area needed for development and micrositing through final design and construction for the Solar Facility as proposed under RFA 5, 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 information contained herein supports demonstration of compliance with the Waste Minimization approval standard for Oregon Administrative Rules (OAR) 345-022-0120.

The information contained herein supports demonstration of compliance with the State and Local Laws and Regulations approval standard for OAR 345-022-0160.

2.0 Description of Water Use – OAR 345-022-0160(1)(b)(A)

> *(b) Information about anticipated water use during construction and operation of the proposed facility. The applicant must include:*
>
> > *(A) A description of the use of water during construction and operation of the proposed facility;*

2.1 Water Use During Construction

Construction water use is estimated at a maximum of approximately 33.5 million gallons (Mgal; up to 106,931 gallons per day) over the construction of the RFA 5 Solar Facility and under annual average conditions. This water will either be sourced from the City of Wasco or other approved sources, supplied via tanker trucks, or may be supplemented by a nearby exempt well, provided such use of well water would not cause the rate of extraction to exceed 5,000 gallons in any one-day period. This analysis accounts for the conservative estimate of construction water use for full build-out of the Solar Components. Water during construction will be used for site dust control, road compaction, concrete mixing for foundations, equipment washing, and fire suppression. Anticipated water use during construction is outlined in Table O2-1.

- **Site dust control**. The primary use of water during construction will be for dust control. The analysis in Table O2-1 assumes that water will be used to control dust generation throughout the construction site, in all disturbed areas including but not limited to access roads, foundation installations, and trenching for collector lines. Water for dust control and road compaction will be applied via tanker truck in a manner that avoids erosion and sediment discharge and is consistent with the best management practices (BMPs) presented in the National Pollutant Discharge Elimination System (NPDES) 1200-C permit (Site Condition PRE-SP-01 in the Fourth Amended Site Certificate [Council 2026]). Water use for dust control assumes work activities happening 6 days per week, during construction, for a total of approximately 30.6 Mgal during construction. Actual water use for dust control will vary, depending on the timing of construction and the season, construction activities, precipitation, soil conditions, temperature, and frequency of repeat disturbance. These factors are not controlled or easily estimated by the contractor.
- **Road compaction**. Water for road construction assumes 25 gallons per lineal foot of road. Section 3.1.3.6 of the RFA 5 Background Exhibit identifies approximately 17.6 miles of new access roads. Approximately 129,067 gallons of water per month (2,323,200 gallons total) will be used for Solar Components service road construction and earthwork compaction.

- **Concrete mixing**. Concrete mixing for foundations will use a standard assumption of 39 gallons of water per cubic yard of concrete. Section 7.0 of Exhibit N identifies 1,800 cubic yards of concrete needed for foundations (BESS, inverters/transformers, substations, and O&M buildings and structures). No on-site batch plant is proposed as part of RFA 5. For the construction of foundations, the Certificate Holder anticipates buying concrete directly from licensed suppliers in the vicinity of the Solar Components. Thus, the water used for concrete mixing will be provided by the concrete suppliers from a lawful source. However, water for concrete production is included in this analysis to represent the maximum anticipated water needs for Solar Components construction. Approximately 70,200 gallons (0.07 Mgal) of water would be used for concrete mixing.
- **Equipment Washing.** Water will be used for washing concrete trucks after delivery of concrete loads (approximately 416,000 gallons). Concrete trucks and truck chutes will be washed down at each foundation site or at a centralized wash area to prevent the concrete from hardening within the chutes. Concrete wastewater will be handled using BMPs, which have been accepted by the Oregon Department of Environmental Quality (ODEQ). Concrete wash water will be put into a dedicated concrete washout area located at each foundation excavation.

Table O2-1. Water Use During Construction of the RFA 5 Solar Facility

Construction Use	Quantity (gallons)
Site dust control	30.6 Mgal
Road compaction	2.3 Mgal
Concrete mixing	0.07 Mgal
Equipment wash stations	0.4 Mgal
Fire prevention/suppression	0.06 Mgal
Total water for non-potable uses	**33.5 Mgal**
Drinking water/sanitation	Negligible
Total	**33.5 Mgal**

While water quantities have been conservatively estimated for purposes of analysis, water used for dust suppression, road compaction, and equipment washing will be applied at the minimum rate necessary to perform its function in an effort to conserve as much water as possible and make a sustainable use of the resource, and due to the cost and time involved in transporting water by tank truck to the RFA 5 Solar Facility. The construction of the Solar Components will be phased and will allow maximum water use efficiency to limit water use to the extent practical. Daily water use will vary depending on site conditions and construction activities. Weather will affect the amount of water needed for dust control and for specific construction activities each day. Total water demand is estimated over the course of phased construction using a conservative 6-day work week. Substantial construction is expected to last 18 months; therefore, the Certificate Holder assumes that all construction water will be used in an 18-month timeframe.

Drinking water, sanitation, and fire prevention/suppression together represents a minor water use. Fire prevention/suppression will include placing up to six 10,000-gallon water tanks around the site and stationing a water truck at the job site to keep the ground and vegetation moist at work areas during extreme fire risk conditions.

2.2 Water Use During Operations

Once constructed, the RFA 5 Solar Facility will have limited water requirements. Potable water will be used at the O&M building for drinking and sanitary purposes, including toilets and sinks. Additional water will be used for wind turbine blade washing and periodically for solar panel washing, with the water sources to be determined as needed. The BESS will not require water usage during operations.

Operational water use associated with the RFA 5 Solar Facility is estimated at up to approximately 340,254 gallons per year, consisting of up to 30,000 gallons per year of potable water for drinking and sanitary purposes, up to 250,254 gallons per year of non-potable water for panel washing, and up to 60,000 gallons per year as needed for fire suppression. Operational water use is described further below.

2.2.1 O&M Buildings

2.2.1.1 Solar Facility

The RFA 4 Solar Facility is currently under construction, with an expected Commercial Operation Date of December 2027. Potable water use at the approved Solar Facility O&M building will be limited to drinking and sanitary purposes. Staffing associated with RFA 4 is expected to include up to four full-time employees initially and is not expected to exceed seven full-time employees following full buildout of the Solar Micrositing Area. Based on an assumed potable water demand of up to 7,500 gallons per employee per year, potable water use at the Solar Component O&M building will not exceed approximately 52,500 gallons per year at full buildout, equivalent to an average of approximately 144 gallons per day.

RFA 5 proposes the addition of a separate O&M building that is distinct from the O&M building approved for RFA 4. Potable water use at the RFA 5 O&M building will similarly be limited to drinking and sanitary purposes. Staffing associated with RFA 5 is expected to include up to four full-time employees following full buildout of the Solar Siting Area. Based on an assumed potable water demand of up to 7,500 gallons per employee per year, potable water use at the O&M building will not exceed approximately 30,000 gallons per year at full buildout, equivalent to an average of approximately 82.2 gallons per day.

The RFA 4 and RFA 5 Solar Facilities will each have a separate O&M building serving their respective Solar Facilities. Accordingly, potable water demand associated with the two phases has been calculated separately. At full buildout, the two O&M buildings are anticipated to support up to 11 full-time employees collectively, with a combined potable water demand of up to approximately 82,500 gallons per year, equivalent to an average of approximately 226 gallons per day.

2.2.1.2 Wind Facility

Water used at the existing BCWF O&M buildings is supplied by the existing exempt well within the BCWF boundary. Typical operational water use at the existing BCWF O&M buildings is estimated at approximately 660 gallons per day. For purposes of evaluating compliance with the exempt well threshold, water use at the existing BCWF O&M buildings is estimated at up to 1,312 gallons per day, including approximately 652 gallons per day associated with filling the BCWF fire pond. A water meter is now tied to the supervisory control and data acquisition system, which allows collection of actual water use data at the BCWF O&M buildings.

2.2.1.3 BCWF Facility

At full buildout of the Solar Facility, combined operational water use at the RFA 4 and RFA 5 Solar Facility O&M buildings and the existing BCWF O&M buildings is estimated at approximately 886 gallons per day. This includes approximately 226 gallons per day associated with the two Solar Facility O&M buildings and approximately 660 gallons per day associated with the existing BCWF O&M buildings.

For purposes of evaluating compliance with the exempt well threshold, total water use from the existing exempt well is estimated at up to approximately 1,538 gallons per day, including approximately 652 gallons per day associated with filling the BCWF fire pond. This represents approximately 31 percent of the 5,000-gallon-per-day exempt well threshold established under Site Condition OPR-WR-01 of the Fourth Amended Site Certificate (Council 2026).

2.2.2 Panel Washing

The solar panels may require periodic washing to minimize the effects of dust and dirt on energy production (referred to as soiling) depending on weather conditions. Specifically, panel washing may be required during drought conditions due to potential dust impacts. For this analysis, it is conservatively assumed that the array panels at each Solar Facility (as approved under RFA 4 and as proposed under RFA 5) will be washed twice a year at a total estimated 500,508 gallons, or 1,001,016 gallons a year across both Solar Facilities. Water will be applied via tanker truck for cleaning and will not have added solvents or chemicals. Water usage frequency and consumption rates are based on standard commercial facility estimates.

2.2.3 Fire Mitigation

Fire suppression during operation of the RFA 4 Solar Facility will consist of four 10,000-gallon water tanks maintained onsite. The RFA 5 Solar Facility will include six 10,000-gallon water tanks maintained onsite for fire suppression. All tanks will be refilled from off-site sources as needed.

The BCWF fire pond fills with rainwater from approximately September to the end of March each year. In June through August each year, BCWF staff add water via a metered hose attached to the existing exempt well to compensate for evaporation and irrigation water drawn from the pond. The

pond is filled one to three times each month from June through August; each fill uses approximately 215 to 652 gallons, depending on water levels.

2.2.4 Total Water Use During Operations

Table O2-2 shows the total water use during operations of the BCWF and the RFA 4 and RFA 5 Solar Facilities over the course of the estimated 30-year life of the facility.

Table O2-2. Water Use During Operations Under RFA 4 and RFA 5 Combined

Operation Use	Quantity (gallons)
O&M building	9.7 Mgal
Panel washing	30 Mgal
Fire mitigation	3 Mgal
Total	**42.7 Mgal**

3.0 Water Sources – OAR 345-022-0160(1)(b)(B)(C)

> *(B) A description of each source of water and the applicant's estimate of the amount of water the facility will need during construction and during operation from each source under annual average and worst-case conditions;*
>
> *(C) A description of each avenue of water loss or output from the facility site for the uses described in (A), the applicant's estimate of the amount of water in each avenue under annual average and worst-case conditions and the final disposition of all wastewater;*

3.1 Water Sources During Construction

The Certificate Holder or the Certificate Holder's third-party construction contractor will obtain construction water from the City of Wasco (or another permitted source[s]) through the municipality's existing water rights and truck the water to the site and in accordance with Site Condition CON-PS-01 in the Fourth Amended Site Certificate (Council 2026). A letter from the City of Wasco indicating they can provide the requested amount of water for construction is included in Attachment O2-1. The Certificate Holder may also source some water from an on-site exempt well, provided such use of well water would not cause the rate of extraction to exceed 5,000 gallons in any one-day period, and/or from an on-site well in accordance with a water right granted by the Oregon Water Resources Department. Additional water sources for use during construction may be pursued prior to and during construction activities in accordance with Site Certificate Condition CON-PS-01. Purchased bottled water may also be used during construction as a potable water source. In total, up to 33.5 Mgal will be used during the construction of the Solar Facility as amended, at approximately 106,931 gallons per day assuming a 6-day work week. Table O2-3 lists the potential water suppliers during construction and relevant information.

Table O2-3. Potential Water Suppliers During Construction

Supplier Name	Contact	Quantity Available (gallons)
City of Wasco	[Name]	4.5 Mgal per month
	Total	**4.5 Mgal per month**

3.2 Water Sources During Operations

During operation, the Certificate Holder and its contractors shall obtain all water required for solar panel-washing activities from off-site sources previously permitted for such uses or from a new or existing on-site well, provided such use of well water would not cause the rate of extraction to exceed 5,000 gallons in any one-day period in accordance with Site Condition OPR-PS-01 in the Fourth Amended Site Certificate (Council 2026). The Certificate Holder may also use a separate on-site well authorized for industrial and commercial use within the limits of a water right granted by the Oregon Water Resources Department.

During operation, purchased bottled water will be used in the O&M building as a potable water source.

The sum of anticipated maximum daily water usage at the proposed and approved Solar Facility O&M buildings and the existing BCWF O&M buildings is below the exempt well threshold of 5,000 gallons per day. This use is considered an exempt, and would not require a new water right to be obtained under Oregon Revised Statutes (ORS) 537.545. The Certificate Holder anticipates that a new exempt well would be drilled for the purpose of supplying water to the O&M building, in which case, it will be constructed in compliance with Site Condition CON-WR-01 in the Fourth Amended Site Certificate (Council 2026). The kitchen, toilets, and shower will drain into a county-approved on-site septic system. In addition, solar modules will be washed up to two times per year, with water procured from the City of Wasco and/or from an on-site exempt well. Sources of water for use during construction will be identified prior to operation of the Solar Facility proposed under RFA 5.

3.3 Water Loss

3.3.1 During Construction

Water use for dust control and concrete production will result in water loss primarily through evaporation and infiltration from wetted construction surfaces and from curing concrete. No water used on the site will be discharged into wetlands, streams, and other waterways. Due to the dry conditions at the Solar Facility and the relatively low rates of water use and application, it is expected that any excess water used during construction will be lost within or near the Amended Site Boundary, primarily through evaporation and infiltration.

Stormwater runoff from construction activities will be managed in compliance with an NPDES 1200-C permit, adhering to the ODEQ regulations for construction stormwater management.

Additionally, the Certificate Holder will comply with ODEQ guidelines for the disposal of sanitary wastewater and the use of portable toilets.

3.3.2 During Operations

Minimal water loss will occur during operations of the proposed and approved Solar Facility. Wastewater from domestic and incidental uses at the O&M building will be discharged to a county-approved septic system located near the O&M buildings. During periodic washing of solar panels (approximately twice per year), wash water will evaporate or infiltrate into the ground. Water from this activity will not be discharged into wetlands, streams, or waterways.

4.0 Thermal Power Plants – OAR 345-022-0160(1)(b)(D)

> *(D) For thermal power plants, a water balance diagram, including the source of cooling water and the estimated consumptive use of cooling water during operation, based on annual average conditions;*

The RFA 5 Solar Facility is not a thermal power plant. Thus, OAR 345-022-0160(1)(b)(D) is not applicable.

5.0 Groundwater Permit Information – OAR 345-022-0160(1)(b)(E)(F)

> *(E) If the proposed facility would not need a groundwater permit, a surface water permit or a water right transfer, an explanation of why no such permit or transfer is required for the construction and operation of the proposed facility;*
>
> *(F) If the proposed facility would need a groundwater permit, a surface water permit or a water right transfer, information to support a determination by the Council that the Water Resources Department should issue the permit or transfer of a water use, including information in the form required by the Water Resources Department under OAR Chapter 690, Divisions 310 and 380; and*

Construction water will be obtained from the City of Wasco (or other permitted source[s]) under an existing municipal water right and may be supplemented by water from on an-site exempt well, provided such use of well water would not cause the rate of extraction to exceed 5,000 gallons in any one-day period; bottled water may also be purchased during both construction and operations as a potable water source. With respect to operations, the Certificate Holder anticipates relying on a new or existing exempt groundwater well (under ORS 537.545). In total, all operational water usage from any or all exempt groundwater wells for the Facility and proposed Solar Facility would not exceed 5,000 gallons per day. Exempt water uses for operations purposes include drinking, flushing toilets, using sinks, and other general industrial uses, as well as washing solar panels up to two times per year. Water will be used for panel washing, using water from City of Wasco under an

existing municipal water right and/or water from a new or existing on-site exempt well, provided such use of well water would not cause the rate of extraction to exceed 5,000 gallons in any one-day period.

There is one irrigation water right within the Solar Micrositing Area for the RFA 4 Solar Facility (Oregon Certificate 57620) and one irrigation water right within the RFA 4 analysis area but outside the RFA 5 Site Boundary or analysis area (Oregon Permit G 16704). None of the land within the RFA 5 Site Boundary or analysis area is included within the boundaries of an irrigation or diking district. The existing water right within the Solar Micrositing Area for the RFA 4 Solar Facility, the Oregon Certificate 57620, is held by a participating landowner for the RFA 4 Solar Facility (Scharf Water Right) and allows for irrigation on up to 325.70 acres. The date of water right priority for this certificate is February 17, 1976. The water comes from "Scharf Well #1 in the John Day River basin," which was drilled in 1975 to a depth of 130 feet and has an authorized limit of 0.660 cubic foot per second measured at the well. While the Scharf Water Right authorizes about 325 acres of irrigation, aerial photographs confirm that about 25 acres are, and have historically been, irrigated within the Solar Micrositing Area for the RFA 4 Solar Facility approved. The Certificate Holder is working with the participating landowner and exploring transferring the Scharf Water Right to industrial use for the life of the RFA 4 Solar Facility. If successful, the transfer would allow the Certificate Holder to use the available water for construction and operation activities for the RFA 4 Solar Facility as well as the RFA 5 Solar Facility, in an amount consistent with current irrigation practices of the 25 acres, including fire suppression and panel washing. Upon Facility retirement, the water could be transferred back to irrigation use. While the transfer of the Scharf Water Right would allow greater flexibility, it is not required to operate the approved or proposed Solar Facilities given the existing supply from the City of Wasco.

6.0 Water Use Mitigation – OAR 345-022-0160(1)(b)(G)

> *(G) A description of proposed actions to mitigate the adverse impacts of water use on affected resources.*

No adverse impacts are expected to result from the Solar Components' water use during construction or operation; therefore, no mitigation measures are proposed.

7.0 References

Council (Oregon Energy Facility Siting Council). 2026. Fourth Amended Site Certificate for the Biglow Canyon Wind Farm. Energy Facility Siting Council, Salem, Oregon. March 2026.

8.0 Approval Standards and Submittal Requirements

Table O2-4. Approval Standards and Submittal Requirements Matrix

Requirements	Location
OAR 345-022-0160 State and Local Laws and Regulations	–
Submittal Requirements	
To assist the Council in determining compliance with all state and local laws and regulations applicable to EFSC and the siting process, submit the following, as directed by the project order described in OAR 345-015-0160:	–
(b) Information about anticipated water use during construction and operation of the proposed facility. The applicant must include:	Section 2.0
(A) A description of the use of water during construction and operation of the proposed facility;	Section 2.0
(B) A description of each source of water and the applicant's estimate of the amount of water the facility will need during construction and during operation from each source under annual average and worst-case conditions;	Section 3.0
(C) A description of each avenue of water loss or output from the facility site for the uses described in (A), the applicant's estimate of the amount of water in each avenue under annual average and worst-case conditions and the final disposition of all wastewater;	Section 3.3
(D) For thermal power plants, a water balance diagram, including the source of cooling water and the estimated consumptive use of cooling water during operation, based on annual average conditions;	Section 4.0
(E) If the proposed facility would not need a groundwater permit, a surface water permit or a water right transfer, an explanation of why no such permit or transfer is required for the construction and operation of the proposed facility;	Section 5.0
(F) If the proposed facility would need a groundwater permit, a surface water permit or a water right transfer, information to support a determination by the Council that the Water Resources Department should issue the permit or transfer of a water use, including information in the form required by the Water Resources Department under OAR Chapter 690, Divisions 310 and 380; and	Section 5.0
(G) A description of proposed actions to mitigate the adverse impacts of water use on affected resources.	Section 6.0

Attachment O2-1. Water Source Letters

City of Wasco

PO Box 26, 1017 Clark Street, Wasco, OR 97065
Phone: 541-442-5515 Fax: 541-442-5001
wascocity@gmail.com

August 12th, 2024

To Whom It May Concern:

This letter is to confirm that the City of Wasco currently estimates that the City has the capacity to provide the requested 81 million gallons of water during the 30-month construction period, at a maximum daily rate of 200,000 gallons, for the proposed PGE/BrightNight LLC electrical generation expansion project at Biglow Canyon Wind Farm. The City also estimates that it has the capacity during the operations phase for the annual 3 acre-feet (977,554 gallons) of water for washing panels after construction completion. These estimates are based on current conditions and operational capabilities of the City water system. This is not a guarantee to provide any specific quantity or quality of water; however, it may be considered a non-binding letter of intent to supply water in accordance with a water purchase agreement to be negotiated in the future.

Sincerely,

Ian Melzer

Ian Melzer
City Clerk/Recorder
Wasco City Hall

Request for Amendment 5 for the Biglow Canyon Wind Farm

Exhibit O. State and Local Laws and Regulations

Part 3. Noise and Cooling Towers

Submitted to
Oregon Energy Facility Siting Council

Prepared for

Portland General Electric Company

Prepared by

October 2026

Table of Contents

1.0 Introduction 1
1.1 Acoustic Terminology 2
2.0 Analysis Area 3
3.0 Predicted Noise Levels – OAR 345-022-0160(2)(a) 3
3.1 Construction Noise Assessment 4
3.2 Operational Noise Assessment 5
3.2.1 Acoustic Modeling Software and Calculation Methods 5
3.3 Input to the Noise Prediction Model 6
3.3.1 Solar and Battery Energy Storage Facilities 6
3.3.2 Substation 7
3.3.3 Gen-tie Line 8
3.3.4 Operating Biglow Canyon Wind Facility 9
4.0 Assessment of Compliance with Applicable Noise Regulations – OAR 345-022-0160(2)(b) 10
4.1 Federal Noise Regulations 10
4.2 State Noise Regulations 10
4.2.1 Exemptions to State Noise Regulations 12
4.3 County and Municipal Noise Regulations 13
5.0 Existing Conditions 13
6.0 Facility Compliance 14
6.1 Cumulative Acoustic Analysis 17
7.0 Measures to Reduce Noise Levels or Impacts to Address Public Complaints – OAR 345-022-0160(2)(c) 19
8.0 Noise Monitoring – OAR 345-022-0160(2)(d) 20
9.0 Owners of Noise Sensitive Properties – OAR 345-022-0160(2)(e) 20
10.0 Evaporative Cooling Towers – OAR 345-022-0160(3) 20
11.0 References 21
12.0 Approval Standards and Submittal Requirements 22

List of Tables

Table O3-1. Estimated L_{max} Sound Pressure Levels from Construction Equipment 5
Table O3-2. Modeled Octave Band Sound Power Level of Solar/BESS Equipment 7
Table O3-3. Transformer Sound Power Level 8
Table O3-4. Gen-tie Line Sound Power Level by Octave Band Center Frequency 9
Table O3-5. New Industrial and Commercial Noise Standards 11
Table O3-6. Sound Pressure Levels (LP) and Relative Loudness 13
Table O3-7. Acoustic Modeling Results, Operation of Solar Components 16
Table O3-8. Acoustic Modeling Results, Cumulative Operation of Solar Components and BCWF 18
Table O3-9. Approval Standards and Submittal Requirements Matrix 22

List of Figures

Figure O3-1. Received Sound Levels, Project Operations

List of Attachments

Attachment O3-1. Tabulated Summary of Acoustic Modeling Results by Receptor Location

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
CadnaA	computer-aided noise abatement program
Certificate Holder or PGE	Portland General Electric Company
Council or EFSC	Energy Facility Siting Council
dB	decibel
dBA	A-weighted decibel
gen-tie	generation tie
HH	hub height
Hz	hertz
ISO	International Organization for Standardization
kV	kilovolt
Leq	steady, continuous sound over a specified time
L_{max}	maximum sound level
L_n	sound exceeded "n" percent of the time
L_w	sound power level
m	meter
MVA	megavolt ampere
MW	megawatt
MWh	megawatt-hour
NSR	noise sensitive receptor
O&M	operations and maintenance
OAR	Oregon Administrative Rules
ODEQ	Oregon Department of Environmental Quality
ODOE	Oregon Department of Energy
ORS	Oregon Revised Statutes
PV	photovoltaic
RD	rotor diameter
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 (together, RFA 5 Site Boundary; see Background Exhibit Figure 4).

The RFA 5 Site Boundary 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.

Exhibit O3 provides the information required by Oregon Administrative Rules (OAR) 345-021-0010(1)(y) in support of RFA 5. The information summarized in this exhibit and described in RFA 5 demonstrates that the Solar Facility can be designed, engineered, constructed, operated, and retired in a manner that satisfies the applicable Council standards. The proposed changes in RFA 5 do not alter the Certificate Holder's ability to comply with applicable Site Certificate Conditions and the approval standard in OAR 340-035-0035.

1.1 Acoustic Terminology

Airborne sound is described as the rapid fluctuation or oscillation of air pressure above and below atmospheric pressure, creating a sound wave. Sound is characterized by properties of the sound waves, which are frequency, wavelength, period, amplitude, and velocity. Noise is defined as unwanted sound. A sound source is defined by a sound power level (L_w), which is independent of any external factors. The acoustic sound power is the rate at which acoustical energy is radiated outward and is expressed in units of watts. Sound energy travels in the form of a wave, a rapid fluctuation or oscillation of air pressure above and below atmospheric pressure. A sound pressure level is a measure of this fluctuation and can be directly determined with a microphone or calculated from information about the source sound power level and the surrounding environment through predictive acoustic modeling. While the sound power of a source is strictly a function of the total amount of acoustic energy being radiated by the source, the sound pressure levels produced by a source are a function of the distance from the source and the effective radiating area or physical size of the source. In general, the magnitude of a source's sound power level is always considerably higher than the observed sound pressure level near a source since the acoustic energy is being radiated in various directions.

Sound levels are presented on a logarithmic scale to account for the large pressure response range of the human ear and are expressed in units of decibels (dB). A dB is defined as the ratio between a measured value and a reference value usually corresponding to the lower threshold of human hearing defined as 20 micropascals. Conversely, sound power is commonly referenced to 1 picowatt, which is one trillionth of a watt. Broadband sound includes sound energy summed across the frequency spectrum. In addition to broadband sound pressure levels, analysis of the various frequency components of the sound spectrum is often completed to determine tonal characteristics. The unit of frequency is hertz (Hz), which corresponds to the rate in cycles per second that sound pressure waves are generated. Typically, a sound frequency analysis examines 11 octave bands (or 33 1/3 octave) ranging from 20 Hz (low) to 20,000 Hz (high). This range encompasses the entire human audible frequency range. Since the human ear does not perceive every frequency with equal loudness, spectrally varying sounds are often adjusted with a weighting filter. The A-weighted filter is applied to represent the frequency response of the human auditory system. Sound exposure in acoustic assessments is commonly measured and calculated as A-weighted dB (dBA). Unweighted sound levels are referred to as linear. Linear dB are used to determine a sound's tonality and to engineer solutions to reduce or control noise as techniques are different for low and high frequency noise.

Sound levels can be measured, modeled, and presented in various formats. The sound metrics that were employed in the following noise assessment have the following definitions:

- L_{eq}: Conventionally expressed in dBA, the L_{eq} is the energy-averaged, A-weighted sound level for the complete time period. It is defined as the steady, continuous sound level over a specified time, which has the same total sound energy as the actual varying sound levels over the specified period.
- L_n: This descriptor identifies the sound level that is exceeded "n" percent of the time over a measurement period (e.g., L_{90} = sound level exceeded 90 percent of the time). The sound level exceeded for a small percent of the time, L_{10}, closely corresponds to short-term, higher-level, intrusive noises (such as vehicle pass-by noise near a roadway). The sound level exceeded for a large percent of the time, L_{90}, closely corresponds to continuous, lower-level background noise (such as continuous noise from a distant industrial facility). L_{50} is the level exceeded 50 percent of the time and is typically referred to the median sound level over a given period.
- L_{max}: The maximum sound level (L_{max}) can be used to quantify the maximum instantaneous sound pressure level over a given measurement period or maximum sound generated by a source.

2.0 Analysis Area

Consistent with OAR 345-027-0360(3), ODOE concurred with the Certificate Holder's use of a defined portion of the approved BCWF site boundary (i.e., RFA 5 Site Boundary) to establish study area boundaries for RFA 5 under OAR 345-001-0010(35). The RFA 5 Site Boundary reflects the Solar Siting Area, and all study areas within the meaning of Oregon Revised Statutes (ORS) 345-001-0010(35) are measured from the RFA 5 Site Boundary. The analysis area for noise impacts is defined in OAR 345-021-0010 as including those noise sensitive receptors (NSRs) within 1 mile of the RFA 5 Site Boundary. Section 2.2 below includes the definition of an NSR. Figure O3-1 shows current site conditions and NSRs located within 1 mile of the RFA 5 Site Boundary.

3.0 Predicted Noise Levels – OAR 345-022-0160(2)(a)

> *OAR 345-022-0160(2) Information about noise generated by operation of the proposed facility, providing evidence to support a finding by the Council that the proposed facility complies with the Oregon Department of Environmental Quality's noise control standards in OAR 340-035-0035, including:*
>
> *(a) Predicted noise levels resulting from construction and operation of the proposed facility.*

Potential noise impacts associated with the construction and operation of the Solar Components are provided below.

3.1 Construction Noise Assessment

Potential noise impacts associated with construction of the Solar Components were reviewed; however, according to OAR 340-035-0035(5)(g), sound originating from construction sites is exempt from state noise regulations.

Construction of the Solar Components will require the use of construction equipment that may have the potential for localized sound on a temporary basis, as construction activities progress. The list of construction equipment that may be used for the Solar Components and estimates of construction sound levels are presented in Table O3-1 using a semi-qualitative approach based on equipment sound levels provided in the *Federal Highway Administration Roadway Construction Noise Model* (FHWA 2006). This equipment is also used for solar projects, so the Federal Highway Administration's sound levels are applicable to incorporate into the Solar Components. Construction activities at the Solar Components can be generally divided into five phases:

- Preparation of the site and staging areas, including grading and on-site access roads;
- Installation of array foundations, conductors, the O&M building, and the control enclosure;
- Assembly of solar panels and electrical connection components;
- Construction of the inverter pad and battery pads, substation, cabling, terminations, and transmission lines; and
- Commissioning of the array and interconnection, revegetation, and waste removal and recycling facilities.

These activities will occur sequentially for discrete groupings of solar arrays, with the potential for overlap. In addition to the solar panels, construction activities will also occur for supporting infrastructure. The inverters and distribution transformers are likely to be completed while respective solar arrays are being constructed; completion of other components, such as the O&M building, will occur independently. Transmission and collector line construction is typically completed in the following stages, but various construction activities may overlap, with multiple construction crews operating simultaneously:

- Preparing the site and site access;
- Installing structure foundations, if required;
- Erecting support structures and poles; and
- Stringing conductors, shield wire, and fiber optic ground wire.

The sound levels resulting from construction activities vary significantly depending on several factors such as the type and age of equipment, the specific equipment manufacturer and model, the operations being performed, and the overall condition of the equipment and exhaust system mufflers. Table O3-1 lists the typical sound levels associated with common construction equipment at various distances. Periodically, sound levels may be higher or lower; however, the overall sound levels should generally be lower due to excess attenuation.

Table O3-1. Estimated L_{max} Sound Pressure Levels from Construction Equipment

Construction Equipment	Expected Sound Level by Distance (dBA)			
	50 feet	1,000 feet	2,500 feet	5,000 feet
Bulldozer (250 to 700 horsepower [hp])	88	62	54	43
Front-end loader (6 to 15 cubic yards)	88	62	54	43
Truck (200 to 400 hp)	86	60	52	41
Grader (13- to 16-foot blade)	85	59	51	40
Shovel (2 to 5 cubic yards)	84	58	50	39
Portable generators (50 to 200 kilowatts)	84	58	50	39
Mobile crane (11 to 20 tons)	83	57	49	38
Concrete pumps (30 to 150 cubic yards)	81	55	47	36
Tractor (0.75 to 2 cubic yards)	80	54	46	35
Pile driving	101	75	68	57

Sources: Beranek 1988, FHWA 2006.
dBA = A-weighted decibel; L_{max} = maximum sound level

All reasonable efforts will be made to minimize the impact of noise resulting from construction activities. Candidate construction noise mitigation measures include scheduling louder construction activities during daytime hours and equipping internal combustion engines with appropriately sized muffler systems to minimize excessive noise emissions.

3.2 Operational Noise Assessment

The Certificate Holder modeled noise sources from the Solar Components to demonstrate that operations will not exceed the noise levels outlined in the Oregon Department of Environmental Quality (ODEQ) Noise Rules.

3.2.1 Acoustic Modeling Software and Calculation Methods

The Solar Components acoustic analysis used DataKustik GmbH's computer-aided noise abatement program (CadnaA; DataKustik 2026). Further details pertaining to this program are given in the following subsections.

3.2.1.1 CadnaA

The acoustic modeling analysis was conducted using the most recent version of CadnaA, a comprehensive three-dimensional acoustic software model that conforms to the International Organization for Standardization (ISO) standard ISO 9613-2 "Attenuation of Sound during Propagation Outdoors" (ISO 1996). The engineering methods specified in this standard consist of full (1/1) octave band algorithms that incorporate geometric spreading due to wave divergence,

reflection from surfaces, atmospheric absorption, screening by topography and obstacles, ground effects, source directivity, heights of both sources and receptors, seasonal foliage effects, and meteorological conditions.

Topographical information was imported into the acoustic model using the official U.S. Geological Survey digital elevation dataset to accurately represent terrain in three dimensions (USGS 2023). Terrain conditions, vegetation type, ground cover, and the density and height of foliage can also influence the absorption that takes place when sound waves travel over land. The ISO 9613-2 standard accounts for ground absorption rates by assigning a numerical coefficient of G=0 for acoustically hard, reflective surfaces and G=1 for absorptive surfaces and soft ground. If the ground is hard-packed dirt (typically found in industrial complexes), pavement, or bare rock or for sound traveling over water, the absorption coefficient is defined as G=0 to account for reduced sound attenuation and higher reflectivity. In contrast, ground covered in vegetation, including suburban lawns, livestock and agricultural fields (both fallow with bare soil and planted with crops), will be acoustically absorptive and aid in sound attenuation (i.e., G=1). A mixed (semi-reflective) ground factor of G=0.5 was used in the Solar Components acoustic modeling analysis and is considered standard engineering practice. In addition to geometrical divergence, attenuation factors include topographical features, terrain coverage, and/or other natural or anthropogenic obstacles that can affect sound attenuation and result in acoustical screening. To be conservative, sound attenuation through foliage and diffraction around and over existing anthropogenic structures such as buildings was not included in this modeling analysis.

Sound attenuation by the atmosphere is not strongly dependent on temperature and humidity; however, the temperature of 10 degrees Celsius (50 degrees Fahrenheit) and 70 percent relative humidity parameters were selected for this analysis and are considered standard engineering practice. Over short distances, the effects of atmospheric absorption are minimal. The ISO 9613-2 standard calculates attenuation for meteorological conditions favorable to propagation, i.e., downwind sound propagation or what might occur typically during a moderate atmospheric ground-level inversion. Though a physical impracticality, the ISO 9613-2 standard simulates omnidirectional downwind propagation. For receivers located between discrete Solar Component sound sources, the acoustic model may result in over-prediction. In addition, the acoustic modeling algorithms essentially assume laminar atmospheric conditions, in which neighboring layers of air do not mix. This conservative assumption does not take into consideration turbulent eddies and micrometeorological inhomogeneities that may form when winds change speed or direction, which can interfere with the sound propagation path and increase effects of attenuation.

3.3 Input to the Noise Prediction Model

3.3.1 Solar and Battery Energy Storage Facilities

The principal sources of noise associated with the solar and BESS facilities are the BESS cooling units, the electrical components of the inverters, the step-up transformer associated with each

inverter skid, and the main power transformer planned for installation as part of the Solar Components. The inverter skids and battery storage units are mounted on pads at grade level.

It is expected that all equipment will potentially operate consistently during both daytime and nighttime hours. The projected operational noise levels are based on Certificate Holder–supplied manufacturer sound power level data with representative octave band sound power level information. Table O3-2 summarizes the equipment's sound power level data used as inputs to the initial modeling analysis. It is assumed that the Solar Component equipment will have similar sound power profiles as those used in the acoustic modeling analysis; however, it is possible that the final manufacturer warranty values may vary slightly.

Table O3-2. Modeled Octave Band Sound Power Level of Solar/BESS Equipment

Equipment	Octave Band Sound Power Level (dBA) by Frequency (Hz)									Broadband (dBA)
	31.5	63	125	250	500	1000	2000	4000	8000	
Photovoltaic Inverter	54	64	79	87	95	91	93	97	82	101
BESS Unit	-	-	71	79	91	90	89	86	78	95
BESS = battery energy storage system; dBA = A-weighted decibel; dBL = linear decibel; Hz = hertz										

3.3.2 Substation

The primary noise source at the substation is the transformer, which generates sound generally described as a low humming. There are three main sound sources associated with a transformer: core noise, load noise, and noise generated by the operation of the cooling equipment. The core vibrational noise is the principal noise source and does not vary significantly with electrical load.

Transformer noise varies with transformer dimensions, voltage rating, and design, and attenuates with distance. The noise produced by substation transformers is primarily caused by the load current in the transformer's conducting coils (or windings) and consequently the main frequency of this sound is twice the supply frequency (60 Hz). The characteristic humming sound consists of tonal components generated at harmonics of 120 Hz. Most of the acoustical energy resides in the fundamental tone (120 Hz) and the first three or four harmonics (240, 360, 480, and 600 Hz).

Circuit-breaker operations may also cause audible noise, particularly the operation of air-blast breakers, which is characterized as an impulsive sound event of very short duration and expected to occur no more than a few times throughout the year. Because of its short duration and infrequent occurrence, circuit breaker noise was not considered in this analysis. The Solar Components include one collector substation located inside the solar array fence line. The substation will include two step-up transformers. The transformer rating of 150 megavolt amperes (MVA) corresponds to a National Electrical Manufacturers Association rating of 82 dBA. The L_W for the substation transformer was calculated using the methodology recommended by the Electric Power Plant Environmental Noise Guide (Volume 1, 2nd edition) (Edison Electric Institute 1983). Table O3-3

presents the transformer sound source data by octave band center frequency input to the acoustic modeling analysis.

Table O3-3. Transformer Sound Power Level

Equipment	Octave Band Sound Power Level (dBA) by Frequency (Hz)									Broadband (dBA)
	31.5	63	125	250	500	1000	2000	4000	8000	
150 MVA Transformer	67	86	98	100	106	103	99	94	85	109
dBA = A-weighted decibel; dBL = linear decibel; Hz = hertz; MVA = megavolt ampere										

3.3.3 Gen-tie Line

Transmission line noise contributes minimally to ambient area noise levels compared to vehicles, aircraft, and industrial sources. The primary acoustic sources consist of maintenance activities, wind interaction, and corona noise. Corona noise occurs when the electrical insulation properties of air partially break down around high-voltage conductors. This phenomenon generates a high-frequency broadband crackling alongside a lower-frequency 120 Hz hum caused by ion movement within alternating current fields (EPRI 2015). Corona intensity increases with higher altitudes and line voltages, but system loading has no effect on its magnitude.

Environmental conditions heavily influence corona sound levels. During rainy weather, the broadband component typically dominates, whereas icing conditions make the lower frequency components more prevalent (EPRI 2015). While initial, uneven precipitation causes fluctuating noise levels, thoroughly wet conductors saturate and produce more stable corona discharges. Lines with high operating voltage gradients experience less noise variation during rain than those with low gradients. Furthermore, fog and snow produce lower noise levels and shorter durations of elevated sound compared to rain events (EPRI 1982). Conversely, fair-weather corona occurs only at surface scratches or dust accumulation, meaning the resulting sound is minimal and indistinguishable from ambient background noise at the edge of the right-of-way.

Substations and wind interactions present minimal noise concerns. Corona noise is negligible at substations because equipment like circuit breakers and switches reduces electromagnetic field gradients, and average buffer distances exceeding 100 meters keep sounds undetectable beyond the fence line (EPRI 1982). Meanwhile, aeolian noise is produced when steady wind flows across towers and lines to create unpredictable hums or whistles. Because it requires rare, perfect wind conditions to persist, aeolian noise is not a significant contributor to disturbance and is excluded from further acoustic analysis.

Table O3-4 presents the sound profile for the 230-kV gen-tie line.

Table O3-4. Gen-tie Line Sound Power Level by Octave Band Center Frequency

Noise Source	Quantity	Octave Band Sound Power Level by Frequency (Hz) dBA									Broadband (dBA)
		31.5	63	125	250	500	1000	2000	4000	8000	
Gen-tie line	1	-	18	43	50	61	70	72	73	68	78
dBA = A-weighted decibels; gen-tie = generation tie; Hz = hertz											

3.3.4 Operating Biglow Canyon Wind Facility

Sound generated by an operating wind turbine comprises both aerodynamic and mechanical sound, with the dominant sound component from modern utility-scale wind turbines being largely aerodynamic. Aerodynamic sound refers to the sound produced from air flow and the interaction with the wind turbine tower structure and moving rotor blades. Mechanical sound is generated at the gearbox, generator, and cooling fan, and is radiated from the surfaces of the nacelle and machinery enclosure and by openings in the nacelle casing.

Wind energy facilities, in comparison to other energy-related facilities, are unique in that the sound generated by each individual wind turbine will increase as the wind speed across the site increases. Wind turbine sound is negligible when the rotor is at rest, increases as the rotor tip speed increases, and is generally constant once rated power output and maximum rotational speed are achieved. It is important to recognize that, as wind speeds increase, the background ambient sound level will generally increase as well, resulting in acoustic masking effects; however, this trend is also affected by local contributing sound sources. As such, during periods of elevated wind speeds when higher wind turbine sound emissions occur, the sound produced from a wind turbine operating at maximum rotational speed may be largely or fully masked due to wind generated sound in foliage or vegetation. In practical terms, this means a nearby receptor would tend to hear leaves or vegetation rustling rather than wind turbine noise. This relationship is expected to further minimize the potential for any adverse noise effects of the Facility. Conversely, these acoustic masking effects may be limited during periods of unusually high wind shear or at receiver locations that are sheltered from the prevailing wind direction.

As discussed above, the existing operational BCWF has been active since 2007 and consists of 217 wind turbines across three phases. Phase 1 consists of 76 Vestas V82 wind turbines and Phases 2 and 3 consist of 141 Siemens SWT-2.3-93 wind turbines. The dimensions and sound power level details of those wind turbines are the following:

- **Phase 1**: 76 Vestas V82 1.65 MW (hub height [HH] = 80 meters [m], rotor diameter [RD] = 82 m). Maximum sound power level of 109.8 dBA warranted by the manufacturer.
- **Phase 2:** 65 Siemens SWT-2.3-93 (HH = 80 m, RD = 93 m). Maximum sound power level of 107 dBA warranted by the manufacturer.
- **Phase 3**: 76 Siemens SWT-2.3-93 (HH = 80 m, RD = 93 m). Maximum sound power level of 107 dBA warranted by the manufacturer.

Additional information pertaining to the modeling inputs used to characterize BCWF operations is provided within the application submitted as part of the Site Certificate on Amendment 3.

4.0 Assessment of Compliance with Applicable Noise Regulations – OAR 345-022-0160(2)(b)

> *(b) An analysis of the proposed facility's compliance with the applicable noise regulations in OAR 340-035-0035, including a discussion and justification of the methods and assumptions used in the analysis;*

This section describes the applicable noise-related requirements at the federal, state, county, and local levels. The acoustic assessment described in this exhibit is limited to that of off-site receptors and not potential on-site noise exposure as regulated by the U.S. Occupational Health and Safety Administration.

4.1 Federal Noise Regulations

There are no federal environmental noise requirements specific to RFA 5.

4.2 State Noise Regulations

The ODEQ developed OAR Chapter 340, Division 35 noise regulations applicable throughout the State of Oregon, with specific requirements in OAR 340-035-0035, "Noise Control Regulations for Industry and Commerce." This standard provides guidance for new noise sources on a previously used site:

> *OAR 340-035-0035(1)(b)(A) New Sources Located on Previously Used Sites. No person owning or controlling a new industrial or commercial noise source located on a previously used industrial or commercial site shall cause or permit the operation of that noise source if the statistical noise levels generated by that new source and measured at an appropriate measurement point, specified in subsection (3)(b) of this rule, exceed the levels specified in Table 8, except as otherwise provided in these rules. For noise levels generated by a wind energy facility including wind turbines of any size and any associated equipment or machinery, subparagraph (1)(b)(B)(iii) applies.*

Table O3-5 gives statistical noise limits as summarized below. All limits are presented in terms of dBA. The L_{50} is the median sound level (50 percent of the measurement interval is above this level, 50 percent is below). The noise limits apply at "appropriate measurement points" on "noise sensitive property."[1] The appropriate measurement point is defined as whichever of the following is farther from the noise source:

- 25 feet toward the noise source from that point on the noise sensitive building nearest the noise source; or
- The point on the noise sensitive property line nearest the noise source.

[1] OAR 340-035-0035(3)(b)

"Noise sensitive property" is defined by OAR 340-035-0015(38) as "real property normally used for sleeping, or normally used as schools, churches, hospitals, or public libraries. Property used in industrial or agricultural activities is not Noise Sensitive Property unless it meets the above criteria in more than an incidental manner."

Table O3-5. New Industrial and Commercial Noise Standards

Statistical Descriptor	Maximum Permissible Statistical Noise Levels (dBA)	
	Daytime (7:00 a.m. – 10 p.m.)	Nighttime (10 p.m. – 7 a.m.)
L_{50}	55	50
L_{10}	60	55
L_1	75	60
Source: OAR 340-035-0035, Table 8		

ODEQ's noise control standards for industrial and commercial sites are provided in OAR 340-035-0035, which have recently been revised. Revisions were related to the compliance assessment for solar energy facilities. One of the revisions to the ODEQ's noise control standards was that, in addition to allowing for quantifying ambient sound levels through field measurements, an assumed background sound level of 26 dBA is also allowed for solar facilities per OAR 340-035-0035(1)(b)(B)(iii)(I), which states the following:

> *The increase in ambient statistical noise levels is based on an assumed background L50 ambient noise level of 26 dBA or the actual ambient background level. The person owning the wind or solar energy facility may conduct measurements to determine the actual ambient L10 and L50 background level.*

Furthermore, the revisions permit landowner participant status to be a justifiable reason for increasing ambient sound levels by more than 10 dBA if the agreement or covenant with that landowner indicates it is acceptable and authorized (per OAR 340-035-0035(1)(b)(B)(iii)(III)):

> *The noise levels from a wind or solar energy facility may increase the ambient statistical noise levels L10 and L50 by more than 10 dBA (but not above the limits specified in Table 8), if the person who owns the noise sensitive property executes a legally effective easement or real covenant that benefits the property on which the wind or solar energy facility is located. The easement or covenant must authorize the wind or solar energy facility to increase the ambient statistical noise levels, L10 or L50 on the sensitive property by more than 10 dBA at the appropriate measurement point.*

In accordance with the regulatory definitions in OAR Chapter 340 Division 35, the analysis presented in this assessment assumes that the Solar Components will constitute an industrial or commercial use located on both previously used and unused sites. Compliance will be evaluated at residences within 1 mile of the RFA 5 Site Boundary relative to the most stringent 50 dBA L_{50} nighttime limit described in Table O3-5. Furthermore, compliance will be evaluated relative to the

ambient anti-degradation standard, which does not allow the Solar Components to increase ambient sound levels by more than 10 dBA. If the assumed background sound level of 26 dBA is selected to represent existing conditions in the RFA 5 Site Boundary, that essentially results in an effective sound limit of 36 dBA.

4.2.1 Exemptions to State Noise Regulations

OAR 340-035-0035(5) specifically exempts construction activity from the state noise standards and regulations, as indicated below. This section also provides an exemption for maintenance of capital equipment, the operation of aircraft (such as helicopters used in project construction), and sounds created by activities related to timber harvest.

OAR 340-035-0035(5) Exemptions:

Except as otherwise provided in subparagraph (1)(b)(B)(ii) of this rule, the rules in section (1) of this rule shall not apply to:

[section abridged for brevity]

(b) Warning devices not operating continuously for more than 5 minutes;

(g) Sounds that originate on construction sites.

(h) Sounds created in construction or maintenance of capital equipment;

(j) Sounds generated by the operation of aircraft and subject to pre-emptive federal regulation. This exception does not apply to aircraft engine testing, activity conducted at the airport that is not directly related to flight operations, and any other activity not pre-emptively regulated by the federal government or controlled under OAR 340-035-0045;

(k) Sounds created by the operation of road vehicle auxiliary equipment complying with the noise rules for such equipment as specified in OAR 340-035-0030(1)(e);

(m) Sounds created by activities related to the growing or harvesting of forest tree species on forest land as defined in subsection (1) of ORS 526.324.

OAR 340-035-0035(6) allows for some exceptions to the state noise regulations:

OAR 340-035-0035 (6) Exceptions:

Upon written request from the owner or controller of an industrial or commercial noise source, the Department may authorize exceptions to section (1) of this rule, pursuant to rule 340-035-0010, for:

(a) Unusual and/or infrequent events;

(b) Industrial or commercial facilities previously established in areas of new development of noise sensitive property;

(c) Those industrial or commercial noise sources whose statistical noise levels at the appropriate measurement point are exceeded by any noise source external to the industrial or commercial noise source in question;

(d) Noise sensitive property owned or controlled by the person who controls or owns the noise source;

(e) Noise sensitive property located on land zoned exclusively for industrial or commercial use.

4.3 County and Municipal Noise Regulations

While there are no specific quantitative noise limits for Sherman County, the county zoning ordinance defers to the ODEQ noise standards as discussed above.

5.0 Existing Conditions

A wide range of noise settings occur within the acoustic analysis area. The background sound level will vary spatially and is related to various physical characteristics such as topography, land use, proximity to transportation corridors, and terrain coverage including extent and height of exposed vegetation. The acoustic environment will also vary in part due to surrounding land use and population density. Areas in proximity to major transportation corridors such as interstate highways and areas with higher population densities are expected to generally have higher existing ambient sound levels as compared to open and rural lands. Table O3-6 shows the relative A-weighted noise levels of common sounds measured in the environment and industry.

Table O3-6. Sound Pressure Levels (LP) and Relative Loudness

Noise Source or Activity	Sound Level (dBA)	Subjective Impression	Relative Loudness (Perception of Different Sound Levels)
Jet aircraft takeoff from carrier (50 ft.)	140	Threshold of pain	64 times as loud
50-hp siren (100 ft.)	130		32 times as loud
Loud rock concert near stage Jet takeoff (200 ft.)	120	Uncomfortably loud	16 times as loud
Float plane takeoff (100 ft.)	110		8 times as loud
Jet takeoff (2,000 ft.)	100	Very loud	4 times as loud
Heavy truck or motorcycle (25 ft.)	90		2 times as loud
Garbage disposal Food blender (2 ft.) Pneumatic drill (50 ft.)	80	Loud	Reference loudness
Vacuum cleaner (10 ft.)	70	Moderate	1/2 as loud
Passenger car at 65 mph (25 ft.)	65		

Noise Source or Activity	Sound Level (dBA)	Subjective Impression	Relative Loudness (Perception of Different Sound Levels)
Large store air-conditioning unit (20 ft.)	60		1/4 as loud
Light auto traffic (100 ft.)	50	Quiet	1/8 as loud
Quiet rural residential area with no activity	45		
Bedroom or quiet living room Bird calls	40	Faint	1/16 as loud
Typical wilderness area	35		
Quiet library, soft whisper (15 ft.)	30	Very quiet	1/32 as loud
Wilderness with no wind or animal activity	25	Extremely quiet	
High-quality recording studio	20		1/64 as loud
Acoustic test chamber	10	Just audible	
	0	Threshold of hearing	
Adapted from: Beranek (1988) and EPA (1971).			

In the past, ambient sound measurements would be collected to characterize the pre-construction ambient acoustic environment for a proposed solar energy and BESS facility in Oregon; however, now that the ODEQ's noise control standards have been revised as described in Section 4.2, a baseline ambient sound of 26 dBA can be assumed, and collection of ambient sound data is not necessary.

6.0 Facility Compliance

Construction activities are categorically exempted under OAR 340-35-0035(5)(g). Construction noise is short term and not expected to result in any significant long-term impacts.

The acoustic modeling analysis evaluated simultaneous operation of all components including the proposed Solar Components (BESS facilities, substation, and gen-tie line) and the Facility. Resultant received sound levels were evaluated at the closest residences (within 1 mile of the RFA 5 Site Boundary) relative to the applicable ODEQ noise regulations.

A sound contour plot displaying modeled operational sound levels in color-coded isopleths is provided in Figure O3-1. The resultant sound contour plot is independent of the existing acoustic environment (i.e., indicates project-generated sound levels only). Table O3-7 presents the results of the acoustic modeling analysis for the Solar Components at each identified NSR. Sound levels are rounded to the nearest whole decimal for consistency with the ODEQ noise regulations. The

assumed background sound level of 26 dBA is given as well as the sound contribution from the proposed Solar Components, and the resultant combined sound level of the background in conjunction with the proposed Solar Components. The incremental increase in sound level relative to background as a result of Solar Components operations is also presented.

Modeling results indicate the Solar Components successfully demonstrate compliance with the 50 dBA L_{50} nighttime maximum permissible noise level prescribed by ODEQ and with the 10 dBA ambient degradation standard at all non-participating NSRs.

Table O3-7. Acoustic Modeling Results, Operation of Solar Components

NSR ID	NSR[1] Status	UTM Coordinates (meters)		Distance to Site Boundary (miles)	Background Sound Level (dBA)	Facility Noise (dBA)	Combined Noise (Background + Facility) (dBA)	Change in Noise (dBA)	Compliance with OAR 340-035-0035
		Easting	Northing						
2	Non-participant	682079	5052862	0.45	26	33	34	8	Yes
3	Non-participant	683008	5055157	0.35	26	36	37	11	Yes
4	Non-participant	685111	5056667	0.24	26	34	34	8	Yes
5	Participant	686509	5055525	0.50	26	32	33	7	Yes
6	Non-participant	687586	5056964	0.74	26	23	28	2	Yes
7	Non-participant	687777	5057680	0.92	26	26	29	3	Yes
9	Non-participant	685188	5051869	0.47	26	34	34	8	Yes
10	Non-participant	685092	5051510	0.41	26	33	34	8	Yes
11	Non-participant	683270	5050395	0.61	26	27	30	4	Yes
12	Non-participant	683250	5050256	0.70	26	27	30	4	Yes
13	Participant	687384	5055418	0.94	26	28	30	4	Yes
14	Non-participant	684851	5057491	0.77	26	28	30	4	Yes

dBA = A-weighted decibel; ID = identification; NSR = noise sensitive receptor; OAR = Oregon Administrative Rules; UTM = Universal Transverse Mercator

1. Participant status for the RFA 5 Solar Facility.

6.1 Cumulative Acoustic Analysis

In response to a request from ODOE, an additional acoustic modeling analysis was conducted evaluating cumulative sound levels for the Solar Components and the existing operational BCWF. The details of the acoustic modeling analysis and assessment of the BCWF is documented within the application submitted as part of the Site Certificate on Amendment 3. Since the locations of the NSRs and BCWF wind turbines have remained the same since that time, cumulative acoustic impacts resulting from the Solar Components operating in conjunction with the BCWF could be calculated through energetic addition. The predicted received sound levels at NSRs from the sound contributions of the Solar Components and BCWF were calculated using the following equation:

$$L_{Cumulative} = 10 \cdot log_{10}\left(10^{\left(\frac{L_{Solar}}{10}\right)} + 10^{\left(\frac{L_{BCWF}}{10}\right)}\right)$$

Where:

$L_{Cumulative}$ = Cumulative sound level from the Solar Components and BCWF (dBA)

L_{Solar} = Sound level from the Solar Components (dBA)

L_{BCWF} = Sound level from the BCWF (dBA)

Cumulative modeling results are presented in Table O3-8. Modeling results indicate the cumulative noise from the Solar Components and existing wind turbines successfully demonstrate compliance with the 50 dBA L_{50} nighttime maximum permissible noise level prescribed by ODEQ and all non-participating NSRs and/or NSRs with an existing noise waiver in place except for NSR IDs 2, 9, and 10. However, the Certificate Holder will implement noise mitigation and/or secure a noise easement with NSR IDs 2, 9, and 10 prior to construction of the Solar Components.

Table O3-8. Acoustic Modeling Results, Cumulative Operation of Solar Components and BCWF

NSR ID	NSR[1] Status		UTM Coordinates (meters)		Background Sound Level (dBA)	Approved Wind Facility Noise (dBA)	Solar Component Noise (dBA)	Combined Noise (Background + Amended Facility) (dBA)	Change in Noise (dBA)	Compliance with OAR 340-035-0035
	Approved BCWF	Amended BCWF	Easting	Northing						
2	Non-participant	Non-participant	682079	5052862	26	37	33	39	13	No
3	Participant	Non-participant	683008	5055157	26	47	36	47	21	Yes[2]
4	Participant	Non-participant	685111	5056667	26	49	34	49	23	Yes[2]
5	Participant	Participant	686509	5055525	26	49	32	49	23	Yes[2]
6	Participant	Non-participant	687586	5056964	26	48	23	48	22	Yes[2]
7	Participant	Non-participant	687777	5057680	26	48	26	48	22	Yes[2]
9	Non-participant	Non-participant	685188	5051869	26	36	34	38	12	No
10	Non-participant	Non-participant	685092	5051510	26	34	33	37	11	No
11	Non-participant	Non-participant	683270	5050395	26	N/A	27	30	4	Yes
12	Non-participant	Non-participant	683250	5050256	26	N/A	27	30	4	Yes
13	Participant	Participant	687384	5055418	26	47	28	47	21	Yes
14	Participant	Non-participant	684851	5057491	26	50	28	50	24	Yes[2]

dBA = A-weighted decibel; ID = identification; NSR = noise sensitive receptor; OAR = Oregon Administrative Rules; UTM = Universal Transverse Mercator

1. Participant status of the approved or amended BCWF.

2. Approved BCWF existing noise easement in place.

7.0 Measures to Reduce Noise Levels or Impacts to Address Public Complaints – OAR 345-022-0160(2)(c)

(c) Any measures the applicant proposes to reduce noise levels or noise impacts or to address public complaints about noise from the facility;

The Certificate Holder has successfully demonstrated compliance with the OAR 340-035-0035 noise regulations; therefore, it is not expected that any further noise mitigation measures will be required during operation of the RFA 5 Solar Facility.

During construction, the following mitigation measures will be considered and incorporated into the contract specifications, as necessary and appropriate, to minimize noise levels to the extent practicable:

- The noisiest operation of heavy construction equipment will be confined to the daylight hours per Site Certificate Condition CON-NC-01.
- Construction site and access road speed limits will be established and enforced during the construction period.
- Electrically powered equipment will be used instead of pneumatic or internal combustion powered equipment, where feasible.
- Material stockpiles and mobile equipment staging, parking, and maintenance areas will be located as far as practicable from NSRs.
- The use of noise-producing signals, including horns, whistles, alarms, and bells, will be for safety warning purposes only.
- All noise-producing construction equipment and vehicles using internal combustion engines will be equipped with mufflers per Site Certificate Condition CON-NC-01. Mobile or fixed "package" equipment (e.g., arc-welders, air compressors) will be equipped with shrouds and noise control features that are readily available for that type of equipment.
- A complaint response system will be established at the construction manager's office to address noise complaints per Site Certificate Condition CON-NC-01. Records of noise complaints during construction must be made available to authorized representatives of the Department of Energy upon request.
- All construction noise complaints will be logged within 48 hours of issuance. The construction supervisor will have the responsibility and authority to receive and resolve noise complaints. A clear appeal process to the Certificate Holder will be established prior to the start of construction that will allow for resolution of noise problems that cannot be resolved by the site supervisor in a reasonable period of time.
- During operation, the Certificate Holder will maintain a complaint response system to address noise complaints. The Certificate Holder will notify the Department within 15 days

of receiving a complaint about noise from the facility. The notification should include the date the complaint was received, the nature of the complaint, the complainant's contact information, the location of the affected property, and any actions taken, or planned to be taken, by the certificate holder to address the complaint.

Final equipment specifications and noise warranty data will be reviewed by an acoustician to ensure compliance with OAR 340-035-0035.

8.0 Noise Monitoring – OAR 345-022-0160(2)(d)

(d) Any measures the applicant proposes to monitor noise generated by operation of the facility; and

Noise monitoring is not proposed for the Solar Components during operation. However, the legislative authority granted to the Council in OAR 345-026-0010(1) states that under ORS 469.430, "the Council has continuing authority over the site for which a site certificate is issued and may inspect, direct the Department of Energy to inspect, or ask another state agency or local government to inspect, the site at any time to ensure that the certificate holder is operating the facility in compliance with the terms and conditions of the site certificate."

9.0 Owners of Noise Sensitive Properties – OAR 345-022-0160(2)(e)

(e) A list of the names and addresses of all owners of noise sensitive property, as defined in OAR 340-035-0015, within one mile of the proposed site boundary.

Attachment O3-1 has a list of the names and addresses of all owners of noise sensitive property within 1 mile from the RFA 5 Site Boundary, as defined in OAR 340-035-0015.

10.0 Evaporative Cooling Towers – OAR 345-022-0160(3)

OAR 345-022-0160(3) If the proposed facility has an evaporative cooling tower, information about the cooling tower plume, including:

(a) The predicted size and frequency of occurrence of a visible plume and an assessment of its visual impact;

(b) The predicted locations and frequency of occurrence of ice formation on surfaces and ground level fogging and an assessment of significant potential adverse impacts, including, but not limited to, traffic hazards on public roads;

(c) The predicted locations and rates of deposition of solids released from the cooling tower (cooling tower drift) and an assessment of significant potential adverse impacts to soils, vegetation and other land uses;

(d) Any measures the applicant proposes to reduce adverse impacts from the cooling tower plume or drift;

(e) The assumptions and methods used in the plume analysis; and

(f) The applicant's proposed monitoring program, if any, for cooling tower plume impacts.

The Solar Facility as proposed under RFA 5 does not include an evaporative cooling tower, so OAR 345-022-0160(3) is not applicable.

11.0 References

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12.0 Approval Standards and Submittal Requirements

Table O3-9. Approval Standards and Submittal Requirements Matrix

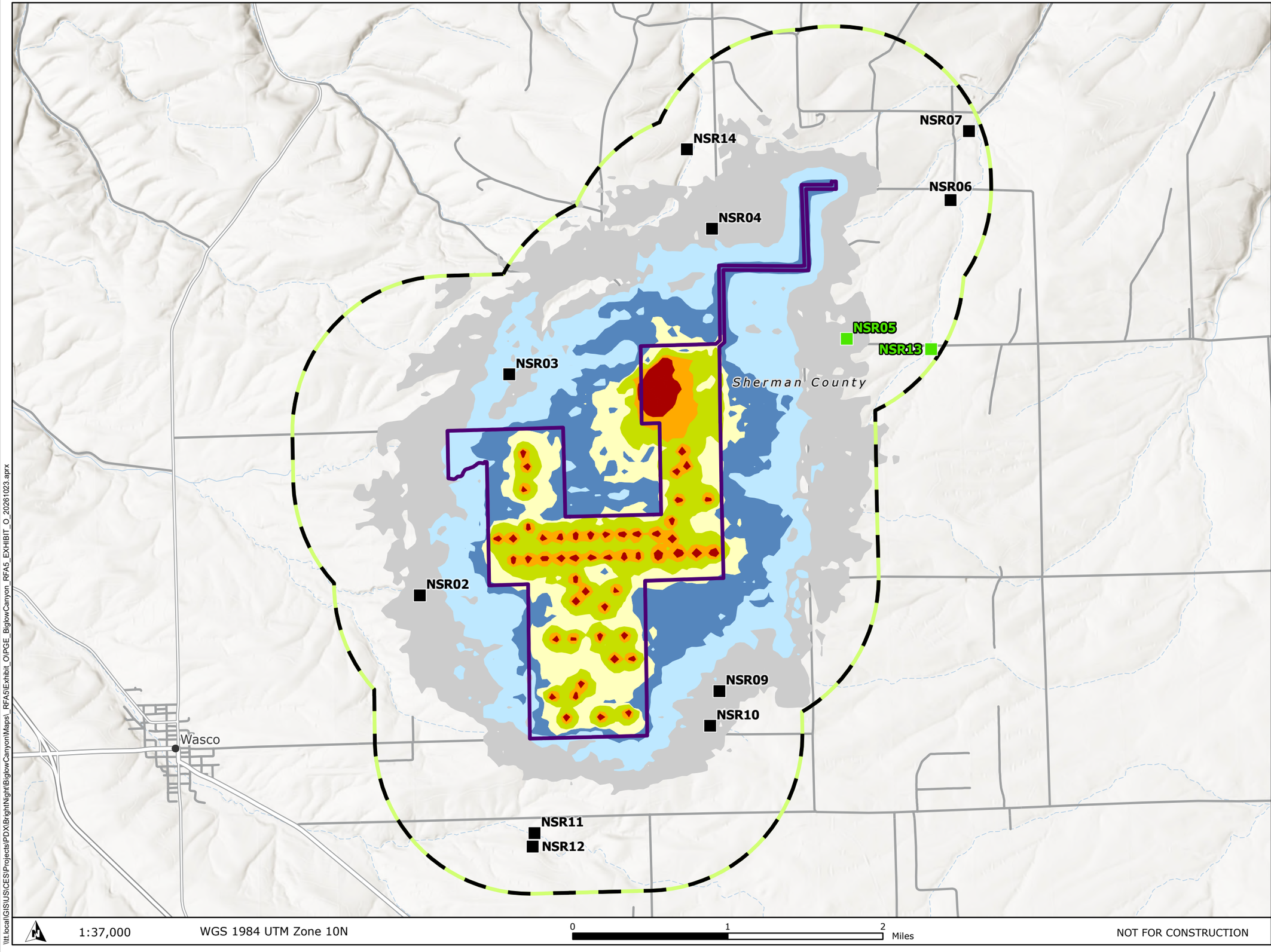
Requirements	Location
OAR 345-022-0160 State and Local Laws and Regulations	–
Submittal Requirements	
To assist the Council in determining compliance with all state and local laws and regulations applicable to EFSC and the siting process, submit the following, as directed by the project order described in OAR 345-015-0160:	–
(2) Information about noise generated by operation of the proposed facility, providing evidence to support a finding by the Council that the proposed facility complies with the Oregon Department of Environmental Quality's noise control standards in OAR 340-035-0035, including:	Sections 3.1 and 3.2
(a) Predicted noise levels resulting from construction and operation of the proposed facility;	Sections 3.2 and 3.2
(b) An analysis of the proposed facility's compliance with the applicable noise regulations in OAR 340-035-0035, including a discussion and justification of the methods and assumptions used in the analysis;	Section 4.0
(c) Any measures the applicant proposes to reduce noise levels or noise impacts or to address public complaints about noise from the facility;	Section 7.0
(d) Any measures the applicant proposes to monitor noise generated by operation of the facility; and	Section 8.0
(e) A list of the names and addresses of all owners of noise sensitive property, as defined in OAR 340-035-0015, within one mile of the proposed site boundary.	Section 9.0
(3) If the proposed facility has an evaporative cooling tower, information about the cooling tower plume, including:	Section 10.0
(a) The predicted size and frequency of occurrence of a visible plume and an assessment of its visual impact;	Section 10.0
(b) The predicted locations and frequency of occurrence of ice formation on surfaces and ground level fogging and an assessment of significant potential adverse impacts, including, but not limited to, traffic hazards on public roads;	Section 10.0
(c) The predicted locations and rates of deposition of solids released from the cooling tower (cooling tower drift) and an assessment of significant potential adverse impacts to soils, vegetation and other land uses;	Section 10.0
(d) Any measures the applicant proposes to reduce adverse impacts from the cooling tower plume or drift;	Section 10.0
(e) The assumptions and methods used in the plume analysis; and	Section 10.0
(f) The applicant's proposed monitoring program, if any, for cooling tower plume impacts.	Section 10.0

Figures

Biglow Canyon Wind Farm Request for Amendment #5

Figure O3-1
Received Sound Levels, Project Operation

SHERMAN COUNTY, OR



- RFA5 Site Boundary
- Analysis Area (1-mile Buffer)
- County Boundary
- City/Town

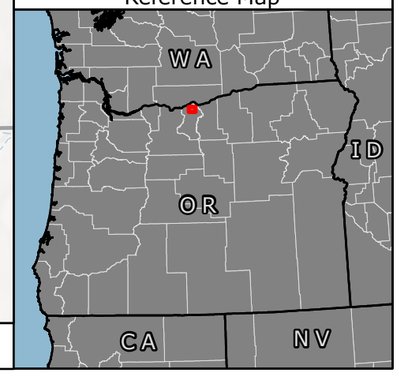
Noise Sensitive Receptors
- Non-Participant
- Participant

Sound Level Contours (dBA)
- 31 - 36
- 36 - 41
- 41 - 46
- 46 - 51
- 51 - 56
- 56 - 61
- > 61

TETRA TECH

PGE

Reference Map



1:37,000

WGS 1984 UTM Zone 10N

0 1 2 Miles

NOT FOR CONSTRUCTION

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Attachment O3-1. Tabulated Summary of Acoustic Modeling Results by Receptor Location

NSR ID	NSR Status		UTM Coordinates (meters)		Name	NSR Address; Contact Address
	Approved BCWF	Amended BCWF	Easting	Northing		
2	Non-participant	Non-participant	682079	5052862	Lyndon McClennan	95761 Old Wasco-Heppner Hwy Wasco, OR 97065; PO Box 215 Wasco, OR 97065
3	Participant	Non-participant	683008	5055157	John and Nancy Fields	96051 Medler Ln Wasco, OR 97066; PO Box 48 Wasco, OR 97065
4	Participant	Non-participant	685111	5056667	James Stuart McNab	71944 Oehman Rd # 380 Wasco, OR 97067; 68080 Petes Road Wasco, OR 97065
5	Participant	Participant	686509	5055525	Brett L. and Trena D. Gray	97351 Emigrant Springs Ln Wasco, OR 97065; PO Box 325 Wasco, OR 97065
6	Participant	Non-participant	687586	5056964	Darlene Janis Smith Kaufman	72281 Biglow Canyon Rd Wasco, OR 97065; 2202 NE 156th Ave Portland, OR 97230
7	Participant	Non-participant	687777	5057680	SCHARF R & A LLC	72445 Biglow Rd Wasco, OR 97070; 7695 Tucker Road Amity, OR 97101
9	Non-participant	Non-participant	685188	5051869	HILDERBRAND FAMILY LTD PART	96249 Hilderbrand Ln Wasco, OR 97065; PO BOX 326, WASCO, OR 97065
10	Non-participant	Non-participant	685092	5051510	John and Wanda Hilderbrand C/O Ormand Hilderbrand	96247 Hilderbrand Ln Wasco, OR 97072; 1003 Boyer Ave Walla Walla, WA 99362
11	Non-participant	Non-participant	683270	5050395	Richard D. and Jean H. McGregor	Klondike Ln Wasco, OR 97073; 10242 SE Walnut Dr Happy Valley OR 97086
12	Non-participant	Non-participant	683250	5050256	Richard D. and Jean H. McGregor	Klondike Ln Wasco, OR 97073; 10242 SE Walnut Dr Happy Valley OR 97086
13	Participant	Participant	687384	5055418	Brett L. and Trena D. Gray	97642 Emigrant Spring Ln Wasco, OR 97068
14	Participant	Non-participant	684851	5057491	Shawn Skiles	72214 OEHMAN RD # 367 Wasco, OR 97076; PO BOX 32 DUFUR, OR 97021

BCWF = Biglow Canyon Wind Farm; ID = identification; NSR = noise-sensitive receptor; UTM = Universal Transverse Mercator