Exhibit Y

Noise

Yellow Rosebush Energy Center
September 2025

Prepared for
Yellow Rosebush Energy Center, LLC

Prepared by

TETRA TECH

This page intentionally left blank

Table of Contents

List of Tables

List of Figures

List of Attachments

Acronyms and Abbreviations

Applicant	Yellow Rosebush Energy Center, LLC
BESS	battery energy storage system
BPA	Bonneville Power Administration
CadnaA	Computer Aided Noise Abatement
dB	decibel
dBA	A-weighted decibel
EFSC	Oregon Energy Facility Siting Council
Facility	Yellow Rosebush Energy Center
FHWA	Federal Highway Administration
Hz	hertz
ISO	International Organization for Standardization
L_{10}	intrusive noise level
L_{50}	median sound level
L_{90}	residual sound level
L_{eq}	equivalent sound level
L_{max}	maximum sound level
L_n	statistical sound level
L_w	sound power level
MVA	megavolt-ampere
MVT	medium voltage transformer
MW	megawatt
NSR	noise sensitive receptor
O&M	Operations and maintenance
OAR	Oregon Administrative Rules
ODEQ	Oregon Department of Environmental Quality
RFA	Request for Amendment
UTM	Universal Transverse Mercator

This page intentionally left blank

1.0 Introduction

Yellow Rosebush Energy Center, LLC (Applicant) proposes to construct and operate the Yellow Rosebush Energy Center (Facility), a solar energy generation facility, battery energy storage system, and related or supporting facilities in Wasco and Sherman counties, Oregon. This Exhibit Y was prepared to evaluate potential sound impacts relative to the applicable noise limits prescribed by the Oregon Department of Environmental Quality (ODEQ) noise rules and to meet the submittal requirements in Oregon Administrative Rules (OAR) 345-021-0010(1)(y).

2.0 Analysis Area

The analysis area for noise impacts is defined in the Project Order[1] as "the area within and extending 1 mile from the site boundary." The Facility site boundary is defined in detail in Exhibits B and C.

3.0 Regulatory Environment

This section describes the noise-related requirements that may be applicable to the Facility at the federal, state, county and local levels.

3.1 Federal Noise Regulations

There are no federal environmental noise requirements specific to this Facility.

3.2 State Noise Regulations

The following subsections describe the regulations at the state level that apply to the Facility, including the Oregon Energy Facility Siting Council (EFSC) rule regarding the contents of Exhibit Y, and the ODEQ's noise control standards in OAR 340-035-0035 (ODEQ Noise Rules).

3.2.1 Required Contents of Exhibit Y

Exhibit Y addresses the following in accordance with OAR 345-021-0010(y):

> *Information about noise generated by construction and 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. The applicant must include:*

[1] Oregon Department of Energy, Project Order for Yellow Rosebush Energy Center (January 2024).

(A) Predicted noise levels resulting from construction and operation of the proposed facility;

(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;

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

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

(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.

3.2.2 ODEQ Noise Rules

OAR Chapter 340, Division 35 prescribes noise regulations (or ODEQ Noise Rules) applicable to the Facility that are incorporated in EFSC's general standard of review under OAR 345-022-0000. The following ODEQ Noise Rules are relevant to the Facility and provide an anti-degradation standard and maximum permissible statistical noise levels for new industrial or commercial noise sources on a previously unused site:

OAR 340-035-0035(1) Standards and Regulations:

(b) New Noise Sources:

(B) New Sources Located on Previously Unused Site:

(i) No person owning or controlling a new industrial or commercial noise source located on a previously unused industrial or commercial site shall cause or permit the operation of that noise source if the noise levels generated or indirectly caused by that noise source increase the ambient statistical noise levels, L10 or L50, by more than 10 dBA in any one hour, or exceed the levels specified in Table 8, as measured at an appropriate measurement point, as specified in subsection (3)(b) of this rule, except as specified in subparagraph (1)(b)(B)(iii).

(ii) The ambient statistical noise level of a new industrial or commercial noise source on a previously unused industrial or commercial site shall include all noises generated or indirectly caused by or attributable to that source including all of its related activities. Sources exempted from the requirements of section (1) of this rule, which are identified in subsections (5)(b)–(f), (j), and (k) of this rule, shall not be excluded from this ambient measurement.

Table Y-1 gives statistical noise levels from Table 8 of OAR 340-035-0035(1)(b)(A). Levels are presented in terms of A-weighted decibels (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."[2] The appropriate measurement point is defined in OAR 340-035-0035(3)(b)(A)(B) 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.

"Noise sensitive property" is defined in 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 Y-1. 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.		

In 2024 the ODEQ's noise control standards were revised and, 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 its 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*

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

statistical noise levels, L10 or L50 on the sensitive property by more than 10 dBA at the appropriate measurement point.

In summary, Facility compliance will be assessed at 25 feet from all identified noise sensitive receptors (e.g., residences). Compliance will be evaluated using two criteria: relative to the most stringent 50 dBA L_{50} nighttime limit described in Table 8, as well as the ambient anti-degradation standard, which does not allow the Facility 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 analysis area, that essentially results in an effective sound limit of 36 dBA.

3.2.3 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.

In accordance with the allowable exemptions, the Facility will claim noise produced during construction as an exemption to the ODEQ Noise Rules.

3.2.4 Exceptions to State Noise Regulations

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.

3.3 County Noise Regulations

There are no quantitative noise limits in Wasco County. Wasco County provides guidance for commercial power generating facilities within Chapter 19 of the Wasco County Land Use and Development Ordinance (Wasco County 2022), stating the following:

The energy facility shall comply with the noise regulations in OAR 340-035.

4.0 Existing Conditions

A wide range of noise settings occur within the acoustic analysis area defined in Section 2.0. 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 due in part to surrounding land use and population density. Areas in proximity to major transportation corridors such as interstate highways and areas with higher population densities and are expected to generally have higher existing ambient sound levels as compared to open and rural lands. Table Y-2 shows the relative A-weighted noise levels of common sounds measured in the environment and industry.

Table Y-2. Sound Pressure Levels (L_P) 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		
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 2.2, a baseline ambient sound of 26 dBA can be assumed, and collection of ambient sound data is not necessary.

5.0 Predicted Noise Levels – OAR 345-021-0010(1)(y)(A)

OAR 345-021-0010(1)(y) Information about noise generated by construction and 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. The applicant must include:

OAR 345-021-0010(1)(y)(A) Predicted noise levels resulting from construction and operation of the proposed facility;

5.1 Construction Noise Assessment

Potential noise impacts associated with Facility construction 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 Facility will require the use of construction equipment that may have the potential for localized sound on a temporary basis, as construction activities progress through certain locations within the Facility site boundary. The list of construction equipment that may be used for the Facility and estimates of construction sound levels are presented in Table Y-3 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 in solar projects, so the Federal Highway Administration's sound levels are applicable to incorporate in this analysis. Construction activities at the Facility are generally categorized as follows:

- Preparation of the site and staging areas, including grading and on-site service roads;
- Installation of array piles, conductors, and the operations and maintenance (O&M) building;
- Assembly of solar panels and electrical connection components;
- Construction of the inverter pad and battery pads, collector substation, battery energy storage system (BESS), cabling, terminations, and generation-tie (gen-tie) line; and
- Commissioning of the solar 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 related or supporting components, such as the O&M building, will occur independently.

Overhead gen-tie 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;
- Erecting of support structures; and
- Stringing of 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 Y-3 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 Y-3. 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
Source: Adapted from Beranek (1988); FHWA 2006. dBA = A-weighted decibel				

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 noise excessive emissions.

5.2 Operational Noise Assessment

The Applicant modeled noise sources from the Facility to demonstrate that operation of the Facility will comply with the ODEQ Noise Rules. Inputs for the acoustic model included the maximum proposed number of inverters, transformers, and battery energy storage system components. This analysis presents the noise outputs from the full build-out of the Facility.

The Applicant calculated broadband sound pressure levels for expected, normal Facility operation, assuming that identified components operate continuously and concurrently at the representative manufacturer-rated sound level during the daytime and nighttime.

5.2.1 Solar and Battery Energy Storage Facilities

The principal sources of noise associated with the solar facilities are the BESS cooling units, the electrical components of the inverters, and the inverter step-up transformers associated with each inverter skid that are distributed throughout the Facility layout. The inverter skids and battery storage units are mounted on pads at grade level.

5.2.2 Substations

The primary ongoing noise sources at substations are the generator step-up transformers, which generate 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.

5.2.3 Generation-tie Lines

Noise generated by transmission lines typically contributes little to area noise levels when compared to other common sources such as vehicles, aircraft, and agricultural and industrial sources. Transmission line sound sources will consist primarily of corona noise in addition to Aeolian noise, and noise associated with maintenance activities. Transmission line noise (also known as corona noise) is caused by the partial electrical breakdown of the insulating properties of air around the electrical conductors and overhead power lines. Audible noise generated by corona on transmission lines is composed of two major components. The higher frequencies of the broadband component distinguish it from more common outdoor environmental noise. The random phase relationship of the pressure waves generated by each corona source along a transmission line results in a characteristic sound commonly described as hum or crackling. The second component is a lower-frequency sound that is superimposed over the broadband noise. The corona discharges produce positive and negative ions that, under the influence of the alternating electric field around alternating current conductors, are alternately attracted to and repelled from the conductors. This motion establishes a sound-pressure wave having a frequency twice that of the voltage (i.e., 120 Hz for a 60-Hz system). Higher harmonics (e.g., 240 Hz) may also be present, but they are generally of lower significance (EPRI 2015). Corona activity increases with increasing altitude, and with increasing voltage in the line, but is generally not affected by system loading. The relative magnitude of hum and broadband noise may be different depending on weather conditions at the line. According to the Electric Power Research Institute, when the line is wet (such as during rainy weather conditions), the broadband component typically dominates; however, under icing conditions, the lower frequency components may be more prevalent (EPRI 2015).

Corona noise levels during precipitation may vary over a wide range. During the initial stages, when the conductors are not thoroughly wet, there may be considerable fluctuation in the noise level as the precipitation intensity varies. When the conductors are thoroughly wet, the noise fluctuations will often be less significant, because even as the intensity of precipitation diminishes the conductors will still be saturated, which can result in corona discharge. The variation in noise levels during rain depends greatly on the condition of the conductor surface and on the voltage gradient at which the conductors are operating. At high operating gradients, the audible noise is less sensitive to rain rate than at low gradients. Consequently, the variation in noise levels is less for the higher gradients. In different weather conditions the relative magnitudes of random noise and hum may be different. Noise levels in fog and snow usually do not attain the same magnitude as compared to rain, and elevated noise levels during fog and snow are usually for a shorter duration in proportion to the event (EPRI 1982).

During fair weather conditions, corona occurs only at scratches or other imperfections in the conductor surface or where dust has settled on the line. These limited sources are such that the corona activity is minimal, and the audible noise generated is very low. Generally, the fair-weather audible noise of transmission lines cannot be distinguished from ambient noise at the edge of the right-of-way.

Corona noise is not generally an issue at substations. The presence of equipment such as circuit breakers, switches, and measuring devices reduces the electromagnetic field gradient on the buses to a great extent. In addition, the distance from most of the buses to the perimeter of the substation is considerable (on average, greater than 100 meters). Consequently, low levels of corona noise would likely not be readily detectable immediately outside the substation fence line (EPRI 1982).

In addition to corona noise, wind blowing across power lines and power poles can generate noise when airflow is non-laminar or turbulent. Aeolian, or wind, noise is produced when a steady flow of wind interacts with a solid object, such as a tower. The interaction produces oscillating forces on the object that in turn can radiate sound as a dipole source at a given frequency.

The occurrence of Aeolian noise is dependent on several factors and is difficult to predict. Wind noise from a stationary source requires perfect conditions: to produce any sound, the wind must blow for enough time in a specific direction at a specific speed; a slight deviation in either the direction or intensity would disrupt the conditions necessary to produce noise. Wind can create a variety of sounds, ranging from a low hum to a snapping sound to a high whistle. Aeolian noise is not considered a significant contributor to noise disturbance and has not been considered further in the acoustic analysis.

5.3 Acoustic Modeling Analysis

Two programs were used for the Facility acoustic analysis, DataKustik GmbH's computer-aided noise abatement program (CadnaA; DataKustik 2023) and the Corona and Field Effects Program Version 3 (Corona 3; BPA 1991). Further details pertaining to these two programs are given in the following subsections.

5.3.1 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, 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 Facility 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 is 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. 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.

5.3.2 Corona and Field Effects Program

Transmission line corona sound levels were evaluated using Corona 3, a DOS-based computer model developed by the Bonneville Power Administration (BPA; BPA 1991). The Corona 3 program uses the algorithms developed by BPA to predict a variety of outputs including electric and magnetic fields and audible noise. The inputs to the Corona 3 model are line voltage, load flow (current), and the physical dimensions of the line (number of phases, conductor diameter, spacing, height, and subconductor configuration), and site elevation.

The BPA method of calculating audible noise from transmission lines is based on long-term statistical data collected from operating and test transmission lines. This method calculates the L_{50} noise level during rainy conditions of 1 millimeter per hour. Long-term measurements show that L_{50} audible noise levels occur at this rain rate. Results during fair weather conditions are also evaluated. Additional details regarding the Corona 3 program are provided in Exhibit AA.

5.3.3 Solar and Battery Energy Storage Facilities

It is expected that Facility equipment would potentially operate consistently during both daytime and nighttime hours. The projected operational noise levels are based on Applicant-supplied manufacturer sound power level data. The BESS unit sound power information is based on manufacturer data testing in accordance with ISO 3744: 2011-02. Table Y-4 summarizes the equipment sound power level data used as inputs to the initial modeling analysis.

Table Y-4. 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	
Inverter	47	53	68	68	70	72	74	81	70	83
BESS Unit	49	59	69	88	86	84	82	77	75	92
MVT	57	70	82	89	99	95	100	98	90	105

5.3.4 Substations

The Facility includes a collector substation located inside the solar array fence line. The collector substation will include four generator step-up transformers. The transformer rating of 240 megavolt ampere (MVA) corresponds to a National Electrical Manufacturers Association rating of 74 dBA. The Lw for the substation generator step-up transformers were calculated using the methodology recommended by the Electric Power Plant Environmental Noise Guide (Volume 1, 2nd edition) (Edison Electric Institute 1983). Table Y-5 presents the transformer sound source data by octave band center frequency input to the acoustic modeling analysis.

Table Y-5. 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	
240 MVA Transformer	61	80	92	95	100	97	93	88	79	104

5.3.5 Transmission Lines

The Facility is considering two options for the point of interconnect (POI) to the regional electric grid. The primary POI under consideration is using a proposed BPA-owned switchyard, located south of the Facility collector substation, which is adjacent to BPA's John Day to Grizzly 500-kV transmission line. The route to the primary POI is a short overhead generation tie (gen-tie) line expected to be less than 1,000 feet long and is essentially internal to the site infrastructure.

The alternate POI under consideration will include a 500-kV gen-tie line starting at the western edge of the collector substation within the Facility in Wasco County and connecting to BPA's existing Buckley Substation located in Sherman County north of the Facility. The route to the alternate POI is an overhead transmission line that runs north alongside three existing 500-kV overhead transmission lines to BPA's existing Buckley Substation. The alternate route is expected to run approximately 4.5 miles.

Audible noise levels associated with the transmission line are dependent upon the configuration of the transmission line. Exhibit AA provides the modeling assumptions used as inputs to Corona 3 for the 500-kV gen-tie line. Figures Y-1 and Y-2 show the calculated audible noise levels calculated for fair and foul weather conditions, respectively. However, to maintain conservatism in assumptions, corona noise from rainy weather was used as input for the acoustic modeling analysis.

Figure Y-1. 500-kV Gen-Tie Line Audible Noise Levels, Fair Weather

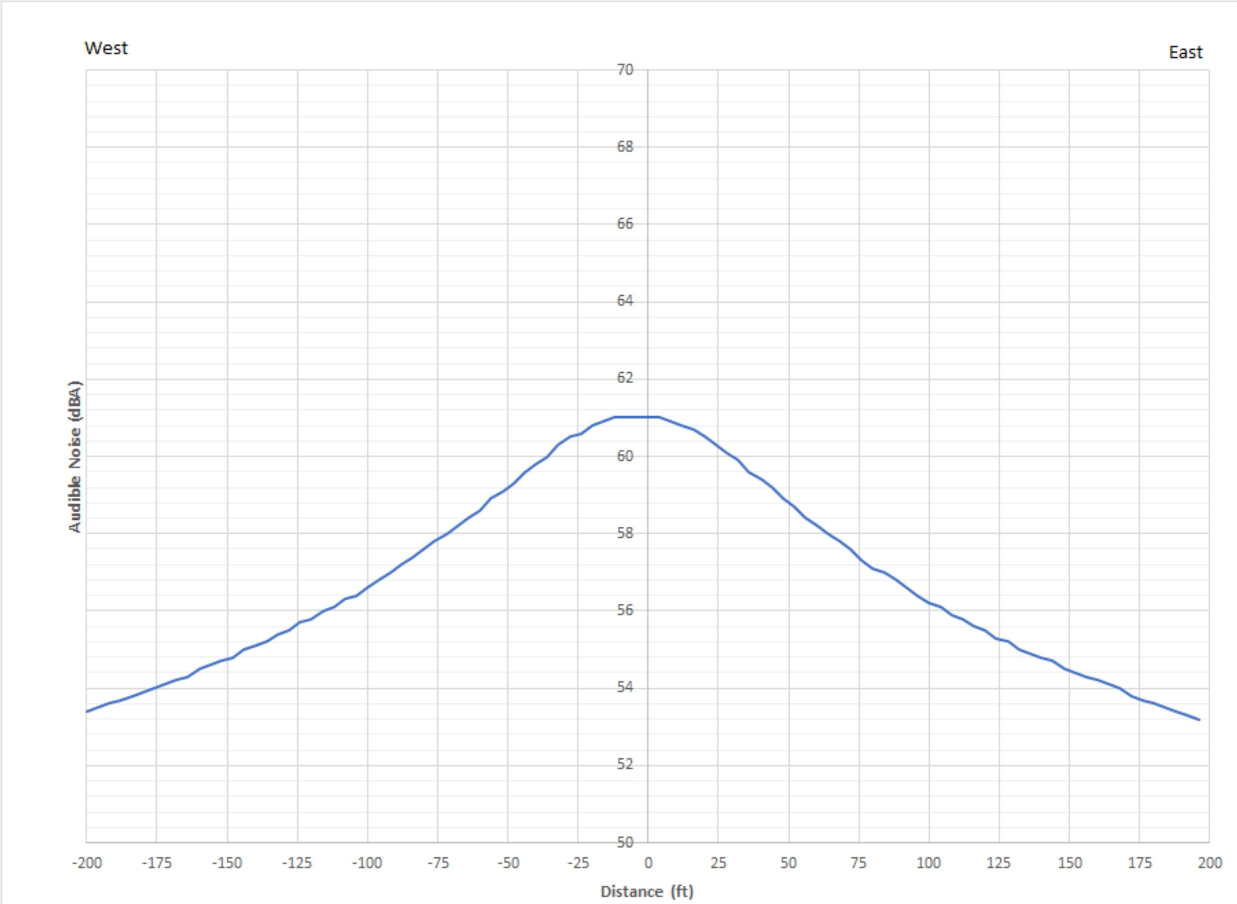
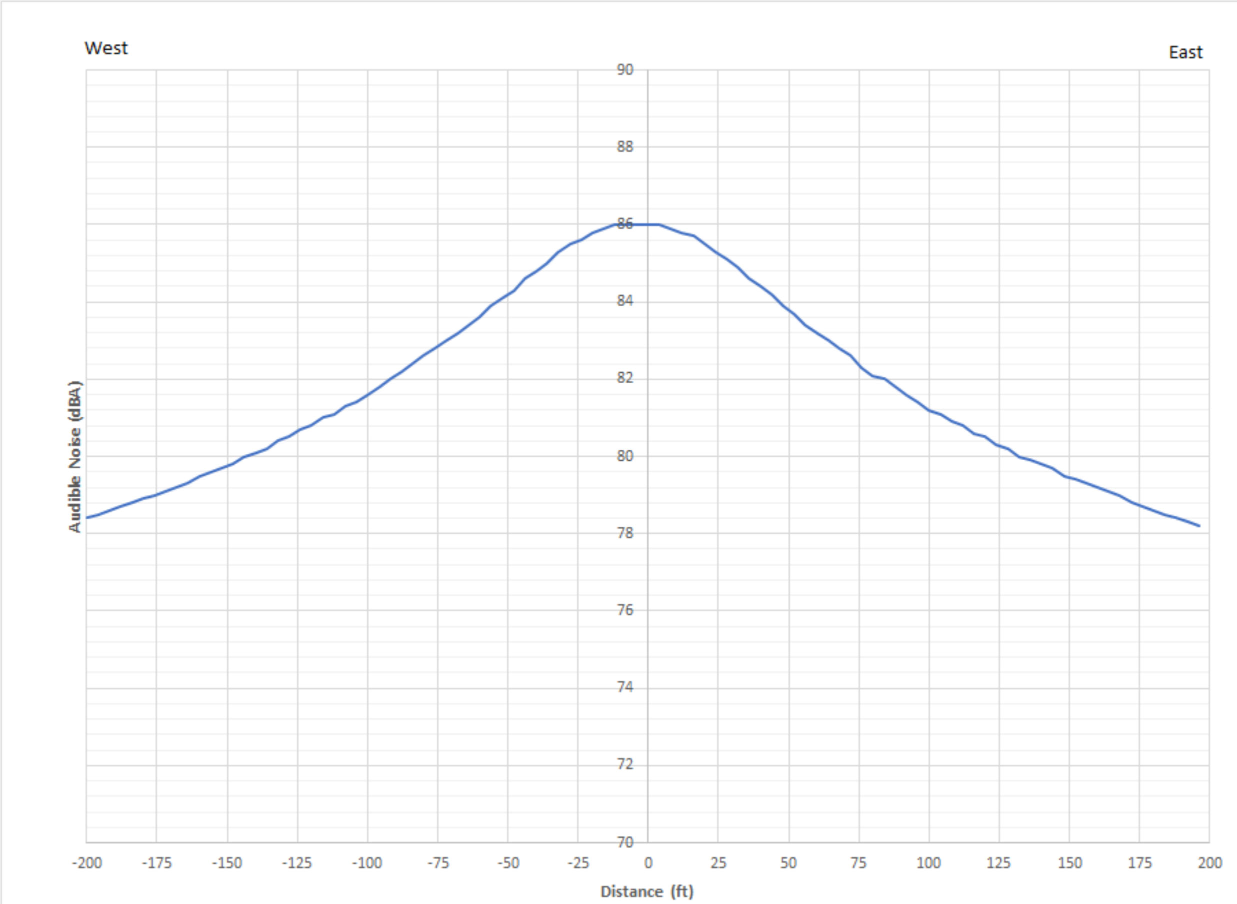


Figure Y-2. 500-kV Gen-Tie Line Audible Noise Levels, Foul Weather



6.0 Assessment of Compliance with Applicable Noise Regulations – OAR 345-021-0010(1)(y)(B)

OAR 345-021-0010(1)(y)(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;

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

The acoustic modeling analysis evaluated simultaneous operation of Facility components including the proposed solar facilities, BESS facilities, collector substation and alternate gen-tie line, which extends north to BPA's existing Buckley Substation. Resultant received sound levels were evaluated at the closest residences within 1 mile relative to the applicable ODEQ noise regulations. The acoustic model contains a number of conservative assumptions, and actual sound levels during Facility operation may be lower than modeled.

Confidential Attachment Y-1 presents the predicted received sound levels at each identified NSR as resulting from operations of the solar components and gen-tie line in isolation and on a cumulative basis. 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 Facility, and the resultant combined sound level of the background in conjunction with the proposed Facility. The incremental increase in sound level relative to background as a result of Facility operations is also presented.

Modeling results indicate that the Facility successfully demonstrates compliance with the 50 dBA L_{50} nighttime maximum permissible noise level prescribed by ODEQ. There are six predicted exceedances of the 10 dBA ambient degradation standard at NSR IDs 1, 2, 3, 4, 5, and 12; however, NSR IDs 4 and 12 are considered participants, therefore it is not requisite to show a successful demonstration of compliance with the 10 dBA ambient degradation standard at those NSRs. If the alternate gen-tie line is selected, the Applicant is committed to resolving the remaining exceedances at non-participating NSR IDs 1, 2, 3, and 5 by revisiting and modifying its route, as necessary. If the primary gen-tie line is selected, which is significantly shorter and routed within the confines of the onsite switchyard and collector substation areas, the Project would successfully comply with the ODEQ noise regulations at all non-participating NSRs.

7.0 Measures to Reduce Noise Levels or Impacts to Address Public Complaints – OAR 345-021-0010(1)(y)(C)

> *OAR 345-021-0010(1)(y)(C) Any measures the applicant proposes to reduce noise levels or noise impacts or to address public complaints about noise from the facility;*

Construction noise is exempt from OAR regulations. Thus, no construction noise measures are planned beyond restricting construction activities to daytime periods and keeping a noise complaint log at the construction site to track and resolve noise complaints.

Prior to construction of each phase, the final Facility design, equipment specifications, and noise warranty data will be modeled and reviewed by an acoustician to demonstrate compliance with OAR 340-035-0035. Based on the results of the modeling, the Applicant will provide legally effective easements or real covenants (as available under DEQ Noise Rules), or noise mitigation implementation, as necessary, to demonstrate compliance with OAR 340-035-0035.

8.0 Monitoring – OAR 345-021-0010(1)(y)(D)

> *OAR 345-021-0010(1)(y)(D) Any measures the applicant proposes to monitor noise generated by operation of the facility; and*

Noise monitoring is not proposed for the Facility during operations. No exceedances of the OAR 340-035-0035 anti-degradation rule or the fixed thresholds will occur for which the Applicant has not obtained a legally effective easement or real covenant, or implemented noise mitigation as necessary, for expected exceedances of the ambient noise degradation test prior to construction. In addition, EFSC has authority under OAR 345-026-0010(1), which states that under Oregon Revised Statute 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 Property– OAR 345-021-0010(1)(y)(E)

OAR 345-021-0010(1)(y)(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.

Confidential Attachment Y-2 has a list of the names and addresses of all owners of noise sensitive property within 1 mile from the Facility site boundary, as defined in OAR 340-035-0015.

10.0 Submittal Requirements and Approval Standards

10.1 Submittal Requirements

Table Y-6. Submittal Requirements Matrix

Requirement	Location
OAR 345-021-0010(1)(y) Information about noise generated by construction and 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. The applicant must include:	-
A) Predicted noise levels resulting from construction and operation of the proposed Facility;	Section 5.0, Section 6.0
(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, Section 5.0, Section 6.0
(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, Attachment Y-2

10.2 Approval Standards

OAR 345 Division 22 does not provide an approval standard specific to Exhibit Y.

11.0 References

Beranek, L. 1988. Noise and Vibration Control, Chapter 7 - Sound Propagation Outdoors. Institute of Noise Control Engineering, Washington, DC.

BPA (Bonneville Power Administration). 1991. Corona and Field Effects Computer Program (Public Domain Software). USDOE: Vancouver, WA.

DataKustik (DataKustik GmbH). 2023. Computer-Aided Noise Abatement Model CadnaA, Munich, Germany.

Edison Electric Institute. 1983. Electric Power Plant Environmental Noise Guide (Volume 1, 2nd edition, Report 3637. 1983 Update). Prepared by Bolt Beranek and Newman Inc.

EPA (U.S. Environmental Protection Agency). 1971. Community Noise. NTID300.3 (N-96-01 IIA-231). Prepared by Wylie Laboratories.

EPRI (Electric Power Research Institute). 1982. Field Effects of Overhead Transmission Lines and Stations.: Transmission Line Reference Book: 345 KV and Above. Second ed., Palo Alto, California.

EPRI. 2015. The Integrated Grid – a Benefit-Cost Framework. Palo Alto, California.

FHWA. 2006. Federal Highway Administration Roadway Construction Noise Model User's Guide, FHWA-HEP-05-054, January 2006.

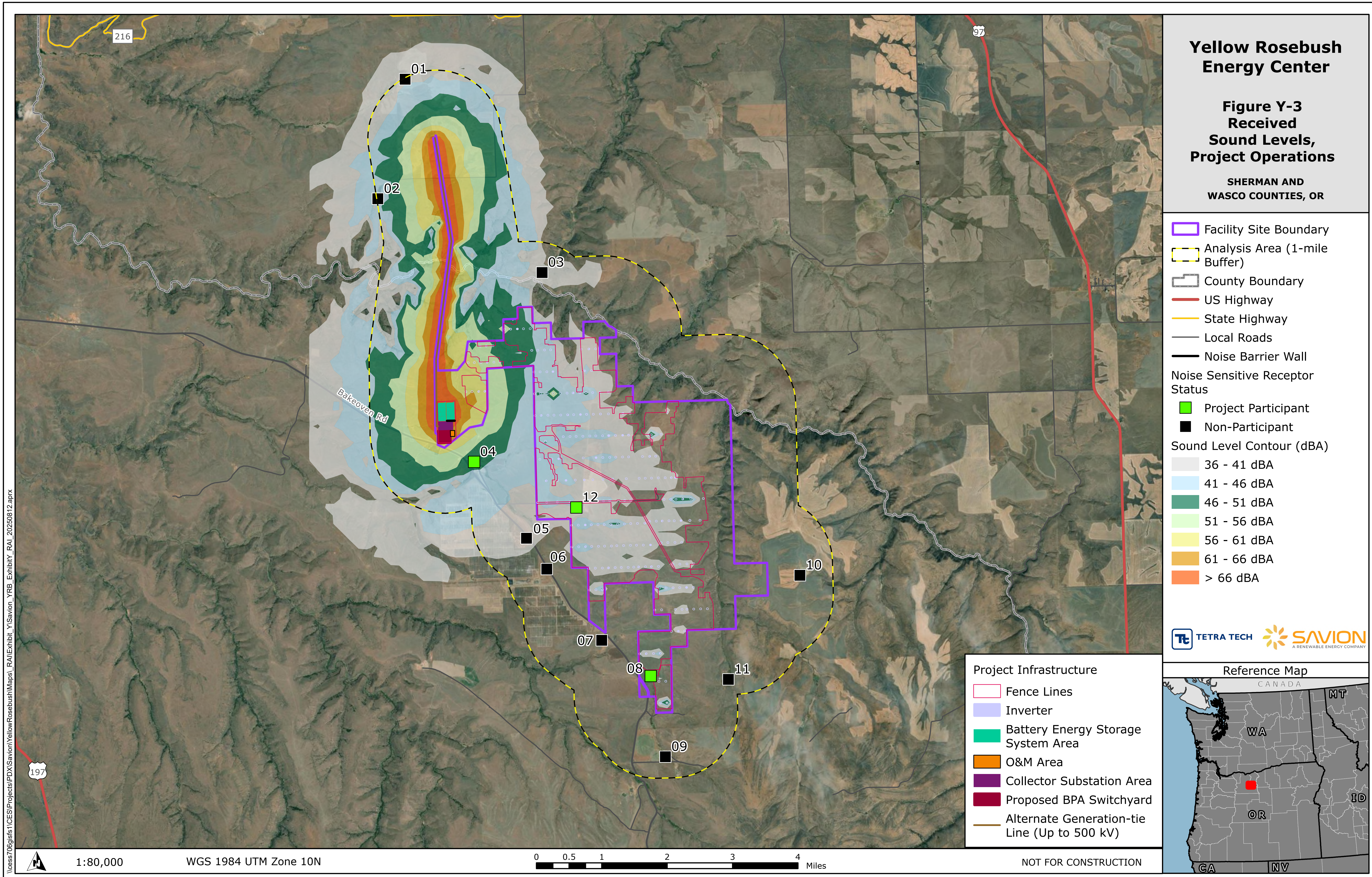
ISO (International Organization for Standardization). 1996. Standard ISO 9613-2 Acoustics – Attenuation of Sound during Propagation Outdoors. Part 2 General Method of Calculation. Geneva, Switzerland.

USGS (U.S. Geological Survey). 2023. National Geospatial Program, USGS National Elevation Dataset 1/3 arc-second. (Publish date unknown.)

Wasco County. 2022. Wasco County Land Use & Development Ordinance. Adopted June 1985. Effective December 5, 2022. https://cms5.revize.com/revize/wascocounty/docs/Planning%20Ordinances/FULL_LUDO_12.05.22_UPDATED_05.15.23.pdf.

Figure Y-3.

This page intentionally left blank



Yellow Rosebush Energy Center
Figure Y-3
Received Sound Levels, Project Operations
SHERMAN AND WASCO COUNTIES, OR
Facility Site Boundary
Analysis Area (1-mile Buffer)
County Boundary
US Highway
State Highway
Local Roads
Noise Barrier Wall
Noise Sensitive Receptor Status
Project Participant
Non-Participant
Sound Level Contour (dBA)
36 - 41 dBA
41 - 46 dBA
46 - 51 dBA
51 - 56 dBA
56 - 61 dBA
61 - 66 dBA
> 66 dBA
TETRA TECH
SAVION
A RENEWABLE ENERGY COMPANY
Project Infrastructure
Fence Lines
Inverter
Battery Energy Storage System Area
O&M Area
Collector Substation Area
Proposed BPA Switchyard
Alternate Generation-tie Line (Up to 500 kV)
Reference Map
CANADA
MT
WA
ID
OR
CA
NV
216
97
197
Bakeoven Rd
01
02
03
04
05
06
07
08
09
10
11
12
1:80,000
WGS 1984 UTM Zone 10N
0 0.5 1 2 3 4 Miles
NOT FOR CONSTRUCTION

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

(Confidential and provided under separate cover)

This page intentionally left blank

Attachment Y-2. Owners of Noise Sensitive Properties

(Confidential and provided under separate cover)

This page intentionally left blank