SECTION 2.1 SITE DESCRIPTION (WAC 463-60-125)

2.1.1 LOCATION OF WHISTLING RIDGE ENERGY PROJECT

The proposed Whistling Ridge Energy Project would be located on private land located approximately 7 miles northwest of the City of White Salmon in Skamania County, Washington (Figure 2.1-1, Location of Proposed Whistling Ridge Energy Project). The project would be located on commercial forestland owned by S.D.S. Co., LLC and Broughton Lumber Company in an unincorporated area of Skamania County, outside of the Columbia Gorge National Scenic Area.

The project site encompasses approximately 1,152 acres in Sections 5, 6, 7, 8, and 18 of Township 3 North, Range 10 East, and in Section 13 of Township 3 North, Range 9 East.

The Applicant seeks approval of construction of wind turbine generators, roads, and electrical collection cables and transmission lines within corridors that will be described and analyzed in the environmental impact statement (EIS). Actual final locations of wind turbine generators and other related and supporting facilities would be established during the micrositing process. During the micrositing process (when the final, exact locations of the turbines and other project elements and equipment are determined), the Applicant must balance a number of technical and engineering factors, including limitations posed by the terrain, wind data (speed, wind sheer, etc.), wake effects of turbines, location of roadways and transportation systems, and feasibility of access, setbacks (internally established or permit requirements), geotechnical considerations (subsurface conditions), environmental restrictions (avoidance of sensitive habitat), cultural/archeological restrictions (avoidance of cultural resource sites), telecommunications constraints (line of sight microwave paths), Federal Aviation Administration (FAA) lighting requirements, and other site-specific criteria that are not fully resolved until final engineering is completed.

Access to the project area is provided by county and private logging roads that extend north from State Route (SR) 14. From SR 14, access would be provided via County roads (Cook-Underwood Road to ~~Kollack-Knapp~~Willard Road~~ onto Scoggins Road~~) and then via a new connection direct to West Pit Road, an existing private logging road. West Pit Road connects~~and then~~ to a network of existing private logging roads. The private logging roads are on S.D.S. Co., LLC and Broughton Lumber Company property, and provide access to most areas where project facilities would be located.

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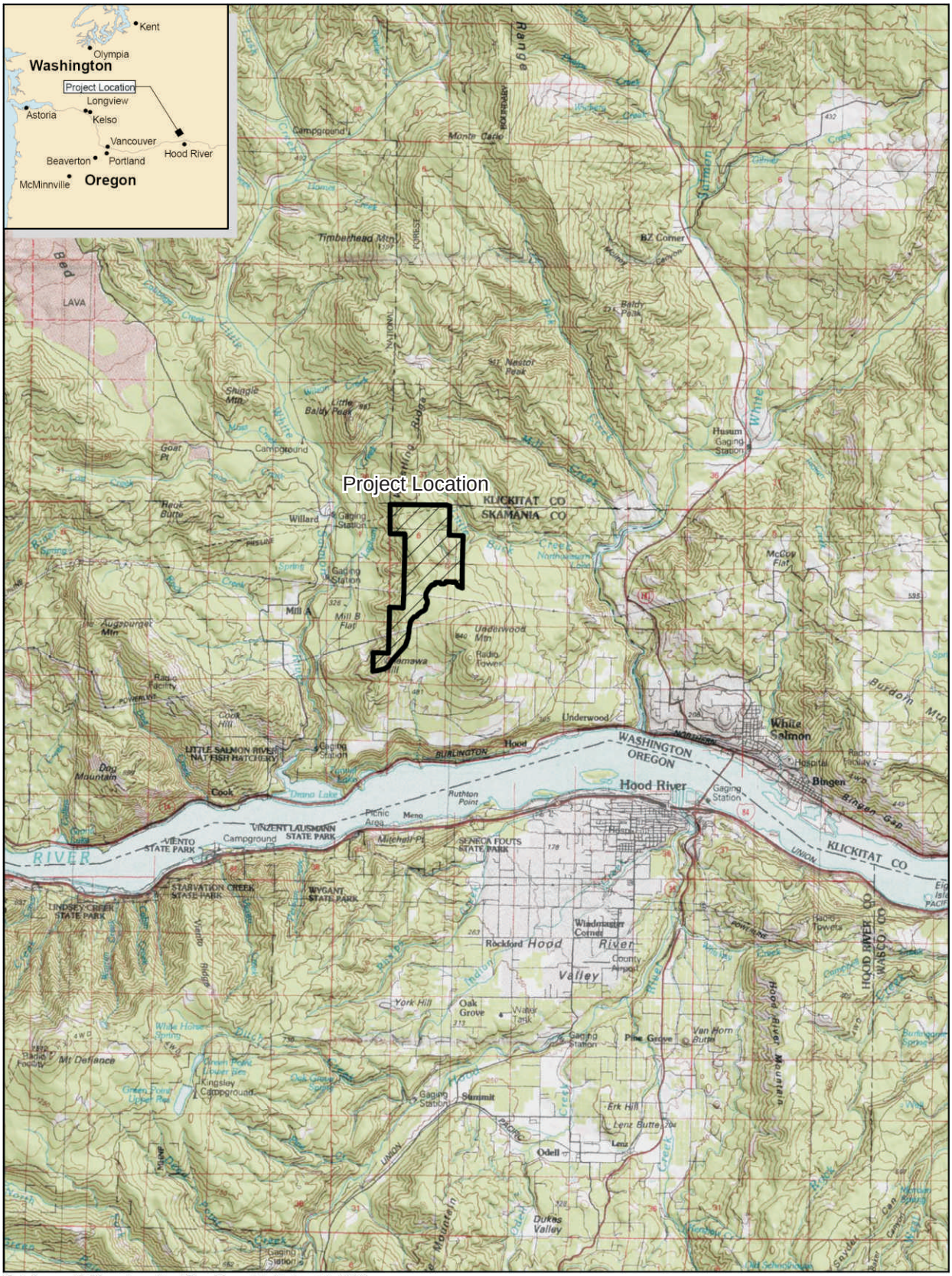

Revised Figure 2.1-1

Location of Proposed Whistling Ridge Energy Project

Job No. 33758687

URS

Whistling Ridge Energy Project
Skamania County, Washington

As shown on Table 2.1-1, approximately 384 acres would be developed for the wind turbine foundations, connecting roadways, and overhead and underground transmission lines.

Table 2.1-1
Area of Development
(acres)

Project Element	Area Proposed for EFSEC Certification and Micrositing	Permanent Impact	Temporary Impact	Total Temporary and Permanent Impact
Project Site[a]	1,152			
Area to be Developed				
Windfarm Footprint[b]	384	NA	NA	
Turbine String Corridor[c]	318	25.4	36.4	61.8
Roadway Corridor within Project Site[d]	48.4	15.2	13.3	28.5
Overhead Transmission Line Corridor within Project Site[e]	6.9	3.45	0	3.45
Underground Transmission Line Corridor within Project Site[f]	8.9	0.0	2.4	2.4
Operation and Maintenance Yard & Storage Area[g]	~~3.1~~5.0	~~3.1~~5.0	0.0	~~3.1~~5.0
Substation Plot & Study Area[h]	7.1	7.1	0.0	7.2
Total Area to be Developed Within Project Site	**NA**	**54.25**	**52.1**	**106.6**
Impact Area Outside of Project Area				
Roadway Corridor Outside Project Site[i] (based on ~~2.1~~2.5 miles of improved road)	~~11.0~~12.1	~~2.1~~6.1	~~5.5~~0	~~7.7~~6.1

a. Project site is the area shown on Figure 2.1-1 bordered in black, encompassing approximately 1,152 acres in Sections 5, 6, 7, 8, and 18 of Township 3 North, Range 10 East, and in Section 13 of Township 3 North, Range 9 East.
b. Windfarm footprint is the total area of all corridors and development study areas in the project boundary with overlapping areas removed, in which development potentially will take place.
c. Total area of 650-foot corridor measured on either side of an imaginary line connecting each turbine in a string. Permanent impacts based on turbine clearance zone and permanent infrastructure in corridor but outside of clearance zone. Temporary impacts based on infrastructure in corridor but outside clearance zone, as described in Section 2.3 and shown on Figure 2.3-4.
d. Area encompassed by a 100-foot corridor along all roads within the project area minus any area that overlaps with 650-foot-wide turbine corridor, based on a roadway length of 7.5 miles.
e. Total area encompassed by a 200-foot corridor on the overhead transmission lines minus any area that overlaps with roadway or turbine string corridors.
f. Total area encompassed by a 100-foot corridor on the overhead or underground transmission lines minus any area that overlaps with roadway, overhead or turbine string corridors.
g. Area includes the 2-acre Operations and Maintenance site plus a 50-foot area around the perimeter.
h. Area includes the 5-acre substation site plus a 50-foot area around the perimeter.
i. Area based on 40-foot corridor (20-foot roadway: 12-foot existing, widened to 20 feet with 10 feet on either side) from project site boundary to ~~intersection of Scoggins and CG2930~~ an intersect point with Willard Road, based on a length of ~~2.1~~2.5 miles.

Because the project site already has a network of logging roads, relatively few new roads would have to be constructed. Approximately ~~7.2~~7.9 miles of existing private logging roads located on land owned by SDS Co., LLC and Broughton Lumber Company would be improved. In areas where there are no existing logging roads near proposed wind turbine strings, approximately 2.4 miles of new gravel access roads would be constructed. All of these construction roads would continue to be used during the project's operational phase.

Of the total ~~9.6~~10.3 miles of access roads, approximately ~~7.5~~7.8 miles would be located within the project area. The remaining approximately ~~2.1~~2.5 miles would be located outside of the

project area ~~within~~ and outside of the Columbia River Gorge National Scenic Area. All new road construction would occur within the project area (Table 2.1-2).

Table 2.1-2
Summary of Access Roadway Improvements and Construction
(acres)

Roadway	Within Project Area	~~Within Columbia River Gorge National Scenic Area~~ Outside of Project Area	Total
Improved roadway	~~5.1~~5.4	~~2.1~~2.5	~~7.2~~7.9
New roadway	2.4	0	2.4
Total	~~7.5~~7.8	~~2.1~~2.5	~~9.6~~10.3

Existing logging roads are constructed, and are regularly improved and maintained to enable large trucks and logging equipment to access the project site for ongoing commercial logging purposes. These roads are generally 8 to 12 feet wide, although some are currently as wide as 20 feet. Improvements to allow use by construction vehicles generally would involve widening and providing a gravel all-weather surface. Most of the roads used to provide access to the site by construction vehicles would be widened to approximately 25 feet (width of finished road), with an additional 5 feet of shoulder on either side.

The project proponent has requested to integrate power from the Whistling Ridge Energy Project into the Federal Columbia River Transmission System (FCRTS) that exists within the project area.

2.1.2 PROMINENT GEOGRAPHIC FEATURES

The project site is located on a series of north-trending ridges that range in elevation from approximately 2,100 to 2,300 feet above mean sea level (msl). The land west of the proposed project site drops sharply to a narrow river terrace and then to an elevation of less than 800 feet above msl in the Little White Salmon River valley. The topography northeast of the site drops gradually toward the White Salmon River or climbs gently up the northeast flank of Underwood Mountain (2,728 feet above msl). To the south, the topography drops to a terrace of largely agricultural use, then toward the Coumbia River.

2.1.3 TYPICAL GEOLOGICAL AND CLIMATOLOGICAL CHARACTERISTICS

The following summarizes the geological and climatological characteristics of the site. For a more complete discussion of site geology, please see Section 3.1, Earth.

2.1.3.1 Geology

The White Salmon, Washington area is located within the Cascade Range and the Columbia Intermontane Physiographic Province. The project area is located just within the western boundary of the Columbia Plateau, which is located at the western edge of the Columbia Intermontane Physiographic Province (Freeman et al. 1945). This lowland province is surrounded on all sides by mountain ranges and highlands, and covers a vast area of eastern Washington and parts of northeastern Oregon and western Idaho.

A variety of younger volcanic rocks and sedimentary materials that range from Pliocene (1.8 to 5.3 million years before the present [BP]) to Holocene (less than 10,000 years BP in age) overlie the Columbia River Basalt Group (CRBG) in the project area. Sedimentary rocks are generally thought to underlie the basalts in the project area.

The proposed project site is located within the northern boundary of the structural Hood River Valley, which extends a few miles into southern Washington. In general, the geology of the area consists of basalt flows extruded from local vents, layered with conglomerate, tuff, tuff breccias, and other volcanoclastic deposits. These formations are typically overlain by silt and clay soil of varying thickness in the project vicinity. The bedrock underlying the proposed project site consists of Grande Ronde Basalt of the CRBG and Quaternary basalt of Underwood Mountain—a shield volcano that lies approximately midway between the lower reaches of the Little White Salmon and White Salmon Rivers. Its southern slopes drain to the Columbia River.

No faults are mapped within the footprint of the proposed Whistling Ridge Energy Project area. However, faults are mapped approximately 1.5 miles southwest and northeast of the proposed project area. Many of these faults are inferred and shown as dotted lines buried by younger surficial deposits. The activity of the area faults is unknown. However, a review of aerial photography shows no indication of recent movement along the trace of the inferred faults.

During the current subsurface exploration, groundwater was not encountered in the site up to a depth of 16 feet below ground surface (bgs). It should be noted that these observations reflect groundwater levels at the time of the field investigation. Actual groundwater levels may fluctuate significantly in response to seasonal effects, regional rainfall, and other factors not observed during this investigation. There may be regional or perched water tables at greater depth. Prior to final design of the tower foundations, additional subsurface investigations (boreholes) would be required to provide geotechnical data at foundation and anchor depths. Future deep foundation investigations will include observation of groundwater, if encountered.

2.1.3.2 Climate

Skamania County's location, sheltered by the Cascade Mountains in the Columbia River Gorge, provides for a moderating climate between the storms rolling in from the Pacific Ocean and the extreme seasonal temperature shifts that occur in eastern Washington. Winters may be near freezing, depending on location, while summers are usually mild. Frequent strong winds and precipitation dominate the weather pattern within the Gorge throughout the year (Haagen 1990).

Temperature and precipitation data was recorded at Wind River, Washington and Bonneville, Oregon from 1951 to 1978 (Haagen 1990). Wind River is at about 1,100 feet above msl and about 15 miles northwest of the Whistling Ridge Energy Project site. Bonneville, Oregon is situated around 80 feet above msl and lies about 19 miles southwest of the project site. Average winter temperatures were 38 and 39 degrees Fahrenheit (°F), respectively, with average daily minimums of 33 and 28°F. The average summer temperatures are 63°F (Wind River, WA) and 65°F (Bonneville, OR) with an average daily maximum of 76°F.

Carson Fish Hatchery, located at 1,130 feet above msl and about 19 miles northwest of the project site, recorded slightly cooler winter and similar summer temperatures from 1977 to 2000 (USDA NRCS 2008). Average December and February temperatures settled around 34°F with average daily minimums around 28°F. Summer temperatures averaged 61°F with daily maximums averaging 80°F.

The average total annual precipitation from 1951 through 1978 is 77 inches at Bonneville, Oregon and 102 inches at Wind River, Washington. Twenty percent of the total precipitation for both areas falls between April and September. The average seasonal snowfalls are 13 and 109 inches, respectively (Haagen 1990). Carson Fish Hatchery received an average annual total precipitation of 88 inches from 1977 through 2000. Average seasonal snowfall during the same period at the fish hatchery totaled 77 inches (USDA NRCS 2008).

The prevailing winds though the Columbia Gorge shift seasonally. Gale force winds are not uncommon. Westerly winds prevail during the summer months. Cold easterly winds usually blow through the Gorge during winter months. These winter winds occasionally collide with the moist Pacific air masses leading to severe ice storms, locally described as silver thaws (Haagen 1990).

Wind power and wind speed maps published by the Northwestern U.S. Wind Mapping Project and verified by the U.S. Department of Energy's National Renewable Energy Laboratory identify the ridge line where the Whistling Ridge Energy Project would be constructed as a viable wind energy resource. Models indicate that winds passing 50 meters above the ground surface in this vicinity reach sustained speeds of between 15.7 and 17.9 miles per hour depending upon location (NWSEED 2002a). Such wind speeds rate this area as wind power potential of good (Class 4) to Outstanding (Class 5) (NWSEED 2002b). One concentrated area within the project area is identified as having outstanding (Class 6) wind power potential with sustained wind speeds of 17.9 to 19.7 miles per hour.

2.1.4 LAND USE PLANS AND ZONING ORDINANCES

A description of the applicable comprehensive plans, zoning, and development regulations and other land use programs relevant to the Whistling Ridge Energy Project is included in Section 4.2.1, Land Use.

The site is located entirely within unincorporated areas of Skamania County. Portions of the land are designated as Conservancy in the Skamania County Comprehensive Plan. The majority of the land is currently zoned as Unmapped, except for a small part of the southwest portion of the project area where seven turbines are proposed, and the alternative site for the maintenance and operations facility located along West Pit Road. Pursuant to the locally adopted land use plans and ordinances in effect at the time of this application, wind energy facilities are an outright permitted use in the Unmapped (UNM) area of the project. In the southwest portion of the property where approximately seven proposed turbines would be located, ~~approximately three to four turbines would be located on~~the property is zoned Resource Protection (For/Ag-20)~~ and three to four turbines would be located on property zoned Residential 10, a transitional zone~~. The site proposed for the alternative Operations and Maintenance facility along West Pit Road, to the west of the project site,

is on land zoned Residential 5. A conditional use permit would be required only for these two areas of the project.

~~Skamania County is in the process of considering amendments to its zoning code. In the current draft ordinance, the entire project area is proposed for Forest Land 20 (FL-20) zoning. This proposed zoning code amendment is being challenged by a variety of parties., including a pending appeal of the County's State Environmental Policy Act (SEPA) determination related to the proposed zoning code. Under the proposed FL-20 zoning, the code would allow "Large-Scale Wind Energy Facilities," subject to conditional use approval.~~

SECTION 2.2 LEGAL DESCRIPTIONS AND OWNERSHIP INTERESTS (WAC 463-60-135)

2.2.1 INTRODUCTION

The proposed Whistling Ridge Energy Project would be located on private land approximately 7 miles northwest of the City of White Salmon in Skamania County, Washington. The project would be located on commercial forestland owned by S.D.S. Co., LLC and Broughton Lumber Company in an unincorporated area of Skamania County, outside of the Columbia River Gorge National Scenic Area.

An alternative site is proposed for a maintenance and operations facility, located outside of and to the west of the project site along West Pit Road. This land is owned by the Broughton Lumber Company.

Whistling Ridge Energy LLC, a special purpose corporation operating in the State of Washington, is developing and would own the project.

The total project area encompasses approximately 1,152 acres in Sections 5, 6, 7, 8, and 18 of Township 3 North, Range 10 East, and in Section 13 of Township 3 North, Range 9 East.

The alternative operations and maintenance yard along West Pit Road would encompass approximately 5 acres in Section 1 of Township 3 North, Range 9 East.

2.2.2 LEGAL DESCRIPTION OF PROPERTY

Real property situated in the County of Skamania, State of Washington, hereby described as follows:

Township 3 North, Range 10 East of the Willamette Meridian:

Section 5: The West Half of the Southwest Quarter.
Section 6: All except for the West Half of the Southwest Quarter.
Section 7: The South Half of the Southwest Quarter, the Northeast Quarter of the Southwest Quarter, the West Half of the Southeast Quarter, the East Half of the Northwest Quarter and the Northeast Quarter excluding lands within the Columbia River Gorge National Scenic Area
Section 8: The West Half of the Northwest Quarter excluding lands within the Columbia River Gorge National Scenic Area
Section 18: The Northwest Quarter, and the Northwest Quarter of the Southwest Quarter excluding lands within the Columbia River Gorge National Scenic Area

Township 3 North, Range 9 East of the Willamette Meridian:

Section 13: The East Half of the Southeast Quarter excluding lands within the Columbia River Gorge National Scenic Area.

2.2.3 LEGAL DESCRIPTION OF ALTERNATIVE MAINTENANCE AND OPERATION FACILITY

Township 3 North, Range 9 East of the Willamette Meridian:

Section 1: Portions of The Southeast Quarter of the Southeast Quarter, and the Southwest Quarter

SECTION 2.3 CONSTRUCTION ON SITE (WAC 463-60-145)

2.3.1 WHISTLING RIDGE ENERGY PROJECT SUMMARY

The Whistling Ridge Energy Project would be constructed in south-central Washington on an approximately 1,152-acre site approximately 7 miles northwest of the City of White Salmon in Skamania County, Washington. The project would be located on commercial forestland owned by S.D.S. Co., LLC and Broughton Lumber Company in an unincorporated area of Skamania County, outside of the Columbia River Gorge National Scenic Area. See Figure 2.1-1, Location of Proposed Whistling Ridge Energy Project.

Turbines would be located on the forested ridges of Saddleback Mountain. The final locations of wind turbine generators and other related and supporting facilities would be established during the final design process (see Section 2.1, Site Description for more information).

The planned facility would have an installed capacity of up to 75 megawatts (MW) of electricity.

2.3.2 PROJECT OVERVIEW

The planned facility is shown on Figure 2.3-1, and would have:

- An installed capacity of up to 75 MW of electricity
- Up to fifty 1.2- to 2.5-MW wind turbines
- Electrical transformers
- 34.5 kilovolt (kV) collector lines and systems (primarily underground)
- Permanent meteorological towers
- Two alternative locations for an ~~An~~ Operations and Maintenance facility
- A substation located adjacent to BPA's existing North Bonneville to Midway 230-kV transmission line
- Approximately 2.4 miles of newly-constructed and ~~7.2~~7.9 miles of improved roads to provide access to the wind turbine locations during construction and for Operations and Maintenance

The project substation would be built on the project site adjacent to BPA's North Bonneville to Midway 230-kV transmission line, facilitating interconnection with the BPA grid. The proposed electrical interconnection to BPA would provide the access to the regional transmission grid for sales to the wholesale electric market. The development of the proposed interconnection requires a federal action, limited exclusively to the interconnection with the BPA grid.

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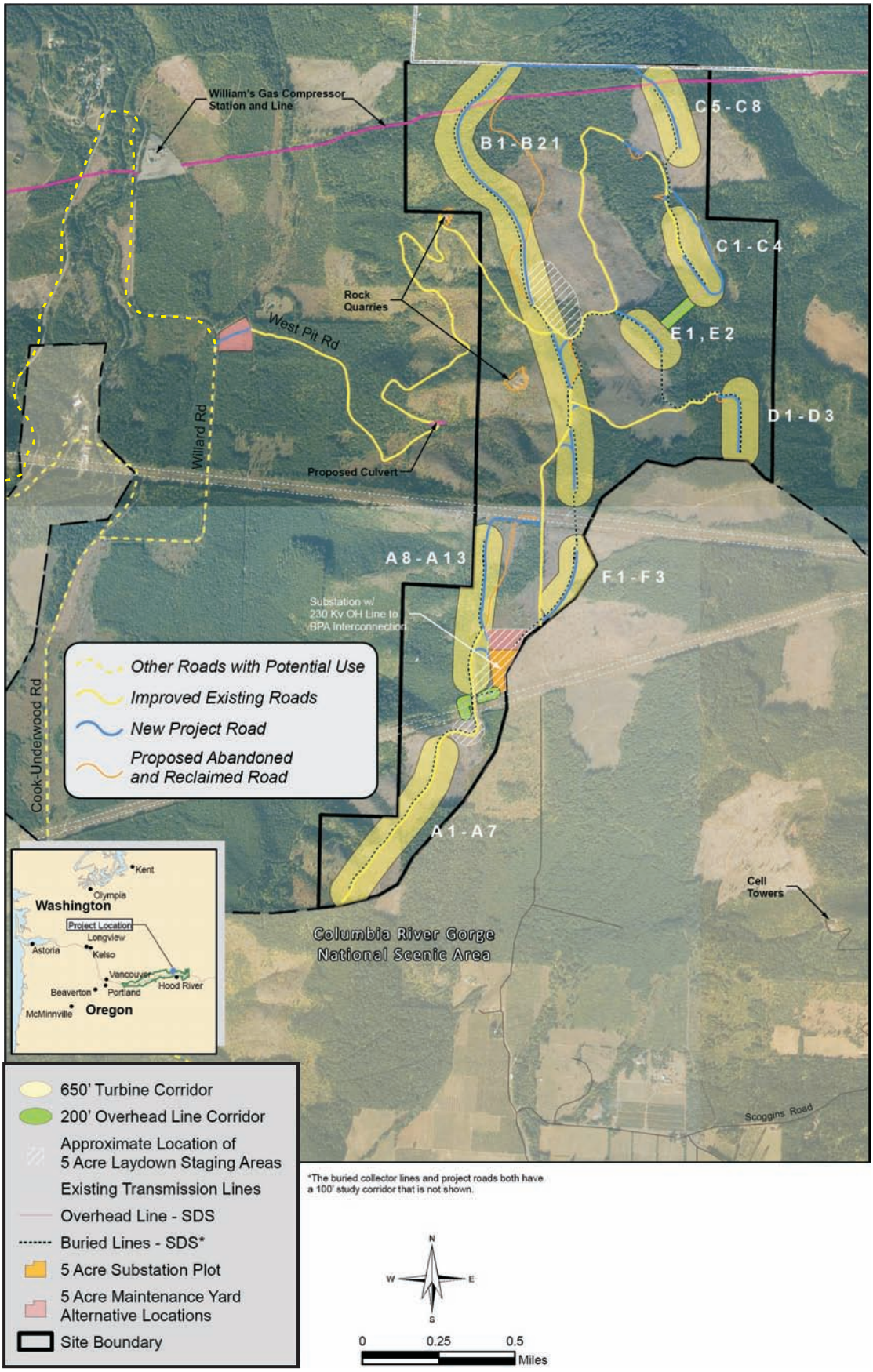

Source: GeoDataScape.

Job No. 33758687

Revised Figure 2.3-1

Proposed Project Elements

URS

Whistling Ridge Energy Project
Skamania County, Washington

The construction phase is anticipated to last approximately one year, during which a total of approximately 330 workers would be employed. Eight to nine permanent full- or part-time Operations and Maintenance staff would be required once the project is operational. See Section 2.12, Construction and Operation Activities for more information.

The Whistling Ridge Energy Project is expected to function for at least 30 years.

2.3.3 PROJECT COMPONENTS

2.3.3.1 Wind Turbines

The project would consist of up to 50 wind turbines. Because of the heightened activity in the wind energy industry, pricing and availability of turbines are highly variable. Consequently, the specific turbine type and manufacturer has not been selected. However, it is likely that the turbines would be in the 1.2- to 2.5-MW range, and the range of key parameters (such as turbine height and diameter) can be anticipated, even if the turbine manufacturer is not yet known.

Each turbine would be up to approximately 426 feet tall (262-foot hub height and 164-foot radius blades, measured from the ground to the turbine blade tip), and would be mounted on a concrete foundation. Wind turbines would be grouped in "strings," each spaced approximately 350 to 800 feet from the next (or approximately 1.5 to 2.5 times the diameter of the turbine rotor). The electrical output of each string would be connected to the project substation by underground 34.5-kV collector cables, and from there would be directly interconnected with the adjacent BPA transmission system. The project would be monitored and controlled from an Operations and Maintenance building centrally located on the project site.

Wind turbines consist of four main aboveground components: the turbine tower (described below), the nacelle, the rotor hub, and the blades. The nacelle is encased in fiberglass, and is mounted at the top of the tower to house the gearbox, the generator, and the control system. The rotor hub is attached to the nacelle, and holds the blades in place. Each turbine has three laminated fiberglass blades, each approximately 129 to 164 feet long, depending on which turbine is selected. The diameter of the circle swept by the rotors would be approximately 264 to 320 feet, depending on which turbine is selected. Together, each turbine's blades, hub, and nacelle would weigh between 95 and 150 tons, depending on the turbine size and model selected.

The wind turbines would operate at wind speeds from 9 to 56 miles per hour (mph), with a rotor speed range of 10 to 20 revolutions per minute (rpm). The turbines operate on a variable pitch principal in which the rotor blades rotate to keep them at the optimum angle to maximize output for all wind speeds. At speeds exceeding 56 mph, the blades feather on their axis and the rotor stops turning. Each turbine is equipped with a wind vane that signals wind direction changes to the turbine's electronic controller. The electronic controller operates electric motors (the yaw mechanism), which turn the nacelle and rotor so that each turbine faces into the wind.

2.3.3.2 Turbine Towers

Depending on which manufacturer is selected, each turbine would be approximately 221 to 262 feet tall at the turbine hub, and with the nacelle and blades mounted, the total height of each wind turbine (to the turbine blade tip) would be up to approximately 426 feet. The towers would be tapered, hollow tubular structures, approximately 14 feet in diameter at the base and weighing approximately 30 tons each. The towers would likely be painted a flat neutral gray or white color. A controller cabinet would be located at the base inside each tower. Cables and a ladder would ascend to the nacelle to provide access for turbine maintenance. A locked door would provide access to the base of the tower. Some of the towers would be furnished with blinking lights visible to aircraft. The need for turbine lights and the type of lighting would be determined in consultation with the FAA.

Each tower would be mounted on a concrete foundation with a diameter up to approximately 60 feet. Tower foundations would be spread footing or pier-type footings.

2.3.3.3 Electrical System

The project's electrical system would consist of two key elements: (1) a collector system, which would collect energy generated at approximately 575 volts from each wind turbine, transform the voltage to 34.5 kV using a pad-mounted transformer, and deliver the energy via underground cables to (2) the project substation, which would further transform the energy delivered by the underground collector system from 34.5 kV to 230 kV and deliver it to the adjacent BPA transmission line and into the regional transmission system.

2.3.3.4 Collector System

Each turbine's 575V/34.5kV transformer adjacent to each tower would be located on a transformer pad, or enclosed in the nacelle, depending on the turbine model. If required, the transformer pad would be approximately 9 feet by 9 feet square and 12 inches thick, constructed approximately 5 feet away from the tower pad. From there, power would be transmitted via underground 34.5-kV electric cables, buried directly in the soil approximately 3 to 4 feet bgs, in a trench up to 5 feet wide. In areas where collector cables from several strings of turbines follow the same alignment (for example, near the substation), multiple sets of cables would be installed within each trench where possible. A disturbed area approximately 30 feet in width is anticipated; however, impacts would be temporary, and the areas outside of roadways would be revegetated after the cable installation is completed. There would be approximately 8.5 miles of underground collector cable trenches. In areas where environmental constraints, geologic features, or cultural features necessitate, minor aboveground placement of collector cables may occur.

2.3.3.5 Substation

The substation site would occupy a portion of a fenced 5-acre area at the southwest end of the project site, immediately adjacent to the BPA 230-kV transmission line. A 50-foot cleared area would be maintained around substation. The substation site would be a graveled, fenced area

with transformer and switching equipment and an area to park utility vehicles. Transformers would be non-polychlorinated biphenyl oil-filled types.

2.3.3.6 Operations and Maintenance Facility

A permanent Operations and Maintenance facility would be constructed on an approximately ~~2~~5-acre area located at one of the following two alternative locations: (1) adjacent to the substation; or (2) to the west of the project site along West Pit Road. It would have approximately 3,000 square feet of enclosed space, including office and workshop areas, a kitchen, bathroom, shower, and utility sink. It would be constructed of sheet metal, and would be approximately 16 feet tall (to the roof peak). Water for the bathroom and kitchen would come from a new on-site well. Water use would be less than 5,000 gallons per day. The bathroom and kitchen would drain into an on-site septic system. A graveled parking area for employees, visitors, and equipment would be located adjacent to the building. The entire area would be fenced and have a locked gate.

2.3.3.7 Access Roads

Access to the project site is provided by county and private logging roads that extend north from State Highway 14. From Highway 14, access would be provided via County roads (Cook-Underwood Road to ~~Kollack-Knapp~~Willard Road~~ onto Scoggins Road~~) and then via a new connection to West Pit Road, an existing private logging road. West Pit Road connects to a network of existing private logging roads (Figure 2.3-1, Proposed Project Elements). The private logging roads are on S.D.S. Co., LLC and Broughton Lumber Company property, and provide access to most areas where project facilities would be located.

Because the project site already has a network of logging roads, relatively few new roads would have to be constructed. Approximately ~~7.2~~7.9 miles of existing private logging roads would be improved. In areas where there are no existing logging roads near proposed wind turbine strings, approximately 2.4 miles of new gravel access roads would be constructed. All new roadway construction would occur on private lands owned by S.D.S. Co., LLC and Broughton Lumber Company. Approximately ~~2.1~~2.5 miles of roadway improvements would occur on West Pit Road, a ~~gravel~~ dirt road covered in light pit run, that connects the project site via Willard Road to the Cook-Underwood Road. West Pit Road is located entirel~~y~~ outside of~~traversing~~ the Columbia River Gorge National Scenic Area. West Pit Road currently varies in width between 20 and 26 feet. To create a drivable surface of 25 feet with 5 feet of of clearing on each side, some widening would be required for the roadway, the existing culvert and some corners. ~~Some of these construction roads~~West Pit Road would continue to be used during the project's operational phase.

Existing logging roads were originally built to enable large trucks and logging equipment to access the project site for ongoing commercial logging purposes. These roads are generally 8 to 12 feet wide, although some are currently as wide as 20 feet. Improvements to allow use by construction vehicles generally would involve widening and providing a gravel all-weather surface. Most of the roads used to provide access to the site by construction vehicles would be widened to approximately 25 feet (width of finished road), with an additional 5 feet of shoulder on either side.

Once assembled, the construction cranes required to erect turbine and tower sections require a ~~40~~35-foot-wide road (of which 25 feet needs to be graveled). Therefore, the roads that run adjacent to turbine strings and roads that connect turbine strings to a central staging area would be approximately 35 feet wide (25 feet plus 5 feet of shoulder on either side). Because cranes might be needed to maintain turbines over their operational life, the 35-foot-wide roads would be kept as maintenance access roads for the expected 30-year life of the project.

All private roadway improvements required prior to hauling and new private roadway construction at the proposed project site would be designed and constructed under the direction of a licensed engineer, in accordance with the standards for the applicable road classifications as set forth in the Skamania County Private Road Guidelines and Development Assistance Manual, as adopted by the County Resolution in 2008. All existing county roadways requiring improvements prior to hauling would be designed and constructed in accordance with the WSDOT *Design Manual* (WSDOT 2007) and *A Policy on Geometric Design of Highways and Street*s (AASHTO 2004). A gravel surface would be installed, compacted to meet all equipment load requirements, and maintained to reduce wind erosion and dust. Existing culverts across intermittent streams would be replaced with wider or stronger culverts as necessary, and drainage improvements would be made (pursuant to a Project Erosion Control Plan and National Pollutant Discharge Elimination System [NPDES] permit) as necessary to control runoff.

In addition to the permanent access roads described above, temporary access may be required for constructing some facilities. For example, constructing the underground collector cables would require that heavy equipment be able to access trench locations where they are not directly adjacent to roads. Generally, equipment would be driven across open ground to accomplish this construction; in some locations minor grading may be required to allow safe access to construction locations (that would be determined only after final pole locations have been selected). These temporary access roads would be regraded and reseeded as necessary to restore vegetation after the construction phase is over.

After the project is constructed, use of the improved and new access roads on private lands would be limited to the landowner and to project maintenance staff.

2.3.4 TRANSMISSION INTERCONNECTION

Power generation resources typically require interconnection with a high-voltage electrical transmission system for delivery to purchasing retail utilities. BPA owns and operates the FCRTS, which includes more than three-fourths of the high-voltage transmission grid in the Pacific Northwest and includes extra-regional transmission facilities. BPA operates the FCRTS, in part, to integrate and transmit "electric power from existing or additional Federal or non-Federal generating units" (16 United States Code [USC] 838b). Interconnection with the FCRTS is essential to deliver power from many generation facilities to loads both within and outside the Pacific Northwest.

In summary, electrical consumers served by the Northwest Power Pool and in other western states need increased power production to serve increasing demand, and high-voltage transmission services to deliver that power. The project proponent has requested to integrate

power from the Whistling Ridge Energy Project into the FCRTS that exists within the project area.

2.3.5 CONSTRUCTION

Construction is expected to take approximately one year, and would likely occur from early spring through late fall. Construction of the project would involve the following tasks:

- Harvesting trees in areas that are not already cleared
- Constructing roads and turbine crane pads
- Constructing foundations for turbine and meteorological towers
- Trenching for underground utilities
- Placing underground electrical and communications cables in trenches
- Constructing the substation
- Constructing interconnections between the substation and the existing BPA transmission line
- Constructing the Operations and Maintenance building
- Transporting tower sections to the site and assembling towers
- Transporting nacelle, rotor, and other turbine equipment to the site and installing the equipment on the assembled towers
- Final testing
- Final road grading, final erosion control, and site cleanup

After the project has been constructed, trees on most of the site would be allowed to mature on a normal forest management schedule (according to the SDS Lumber Company staff, trees in the project area grow about 2 foot per year on average). Figure 2.3-2, Forest Management, shows the current forest types in the project area.

The exception would be in an area immediately surrounding the turbines and the access roads to the turbines. To allow for safe access to each tower for maintenance, to eliminate the potential for trees falling against the towers during storms, and for fire protection, an area extending approximately 150 feet from the center of each tower would be managed to maintain vegetation below approximately 15 feet in height. These dimensions may be adjusted during the final micrositing process to best balance the interest of maximizing electrical generation, along with maximizing replanting of all trees to ensure the best possible operation of the site for ongoing commercial forestry purposes.

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Conifer Forest, Saw Timber 50+ft
Conifer Forest, Pole, 20-50ft
Brush/Sapling/Shrub, 4-20ft
Grass-Forb, 0-4ft.
Riparian
650' Turbine Corridor
Site Boundary
Columbia River Gorge National Scenic Area
Exisiting Roads

0 0.25 0.5 Miles

N

Aerial Photo: 2006 USDA NAIP Imagery
Forest Cover Source: SDS Lumber Company

Source: GeoDataScape.

Job No. 33758687

Revised Figure 2.3-2

Current Forest Types

URS

Whistling Ridge Energy Project
Skamania County, Washington

2.3.6 FOREST HARVEST

The project site is on land managed for commercial forestry by S.D.S. Co., LLC and Broughton Lumber Company. All of the parcels on which the project is located are managed for a continual cycle of growth, harvest, and replanting. As a longstanding commercial forestry site, no old-growth forests exist in areas where the project is proposed. Many of the remaining stands of trees on the sections of land that would have turbines on them are near maturity and S.D.S. Co., LLC and Broughton Lumber Company implemented timber harvest plans on portions recently. Harvests have occurred in the project area over time, pursuant to long-established harvesting schedules (Figure 2.3-3, Harvesting Schedule).

Harvests have typically occurred approximately every 50 years; however, the harvest periods vary depending on the market and the demand for the type of timber. As a result, some harvests have occurred as frequently as 40 years, and some have been up to 65 to 70 years. Additional harvests are planned, subject to requirements of a Forest Practice Application.

In areas surrounding the proposed wind turbines that have not been recently harvested or that are not planned to be harvested before project construction, trees would be harvested and the land would be replanted with seedlings. This clearing would allow for safe construction, and would reduce the potential for tree growth to interfere with the wind resource on the site during the commercial life of the project (that is, during the 30-year commercial life of the project, trees that are planted at the time of construction in the cleared area would regrow at a rate that would not interfere with wind energy production). Typically, the cleared area would extend approximately 50 feet in all directions from each turbine. From a distance of approximately 50 feet to 150 feet from the base of the turbines, tree heights would be limited to a height of approximately 15 feet above the elevation of the base of the turbine. Extending from approximately 150 feet to 500 feet from the base of the turbines, there would be a restriction of approximately 50 feet in height above turbine foundation level for trees located within an area formed by a 90-degree angle centered on the prevailing wind direction and on the downwind side of the prevailing wind direction. Final locations and dimensions would be determined during the final design, micrositing and construction process (Figure 2.3-4, Turbine Timber Buffer)

In addition to the clearing around turbines, there would be an approximately 100-horizontal-foot limitation placed on trees along any overhead electrical cable corridors, or such standards as are determined by the project engineers in consultation with BPA or others, as applicable.

The permanently disturbed, cleared area described above would be considered a “forest conversion” under the Washington Forest Practices Act (WFPA) because it is being implemented for the purpose of the project. However, to the extent feasible for the project, cleared areas would be reforested in accordance with typical commercial forestry management practices.

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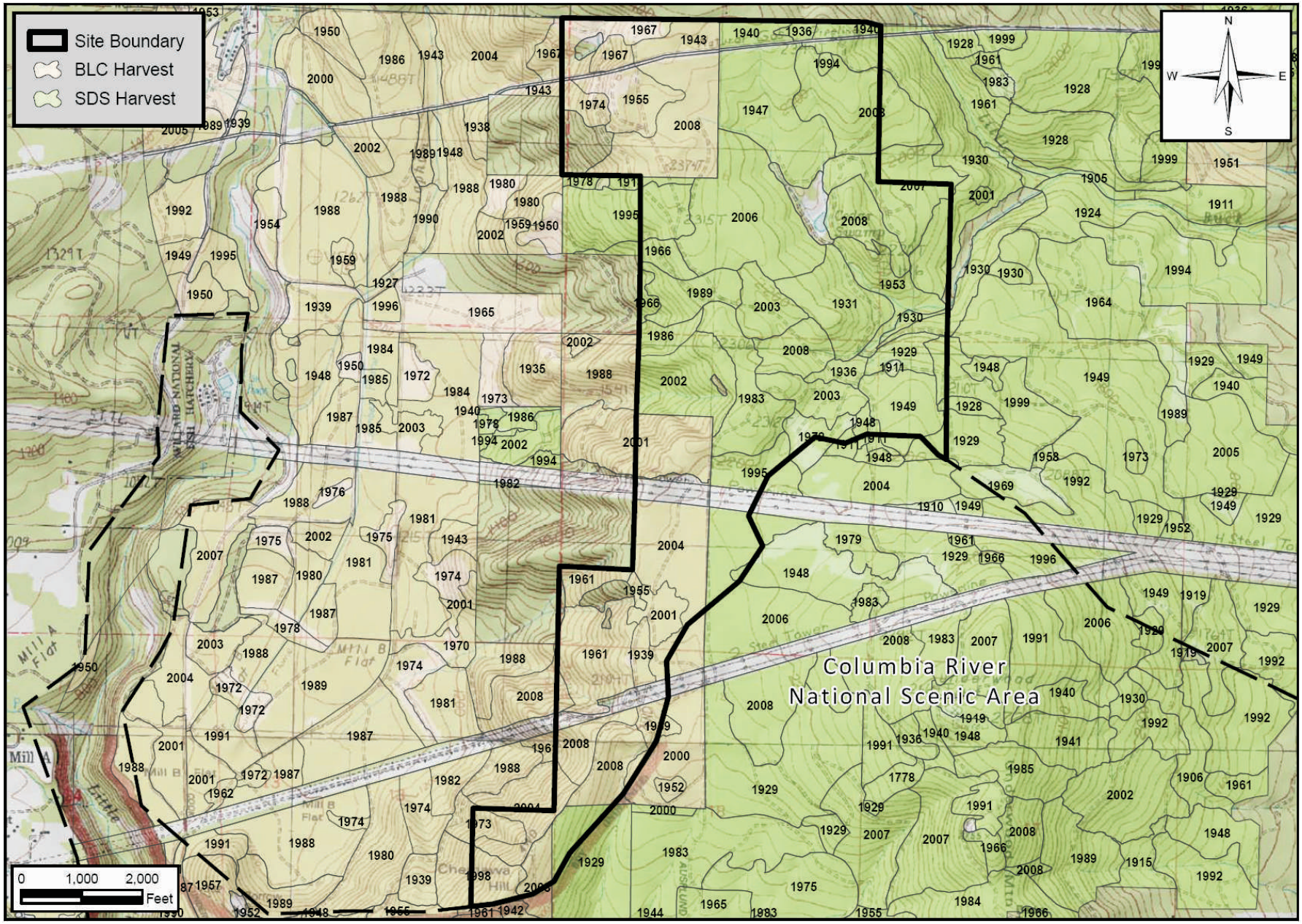


Source: SDS Lumber

Job No. 33758687

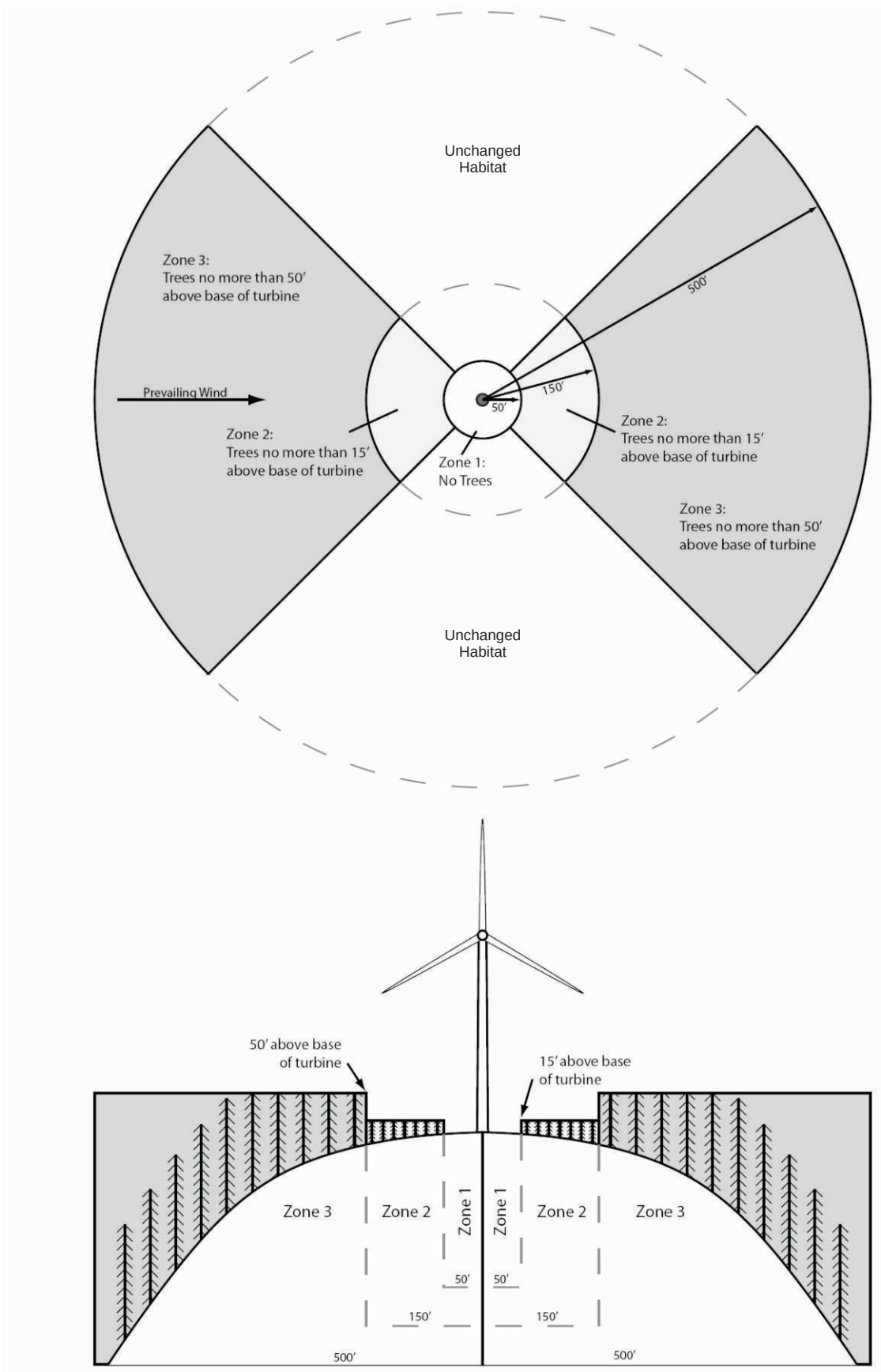
Figure 2.3-3

Harvesting Schedule

URS

Whistling Ridge Energy Project
Skamania County, Washington

33758687_74.cdr



Source: GeoDataScape.

Job No. 33758687

Figure 2.3-4

Turbine Timber Buffer

URS

Whistling Ridge Energy Project
Skamania County, Washington

The areas where tree clearing is required would be clear-cut using crawler tractors, rubber-tired skidders, and mobile feller-bunchers, as has been done on other stands on the property. Logs would be transported by truck to SDS Lumber Company facilities in Bingen, Washington. Except for areas to be maintained and permanently cleared for the construction of permanent improvements and ongoing maintenance and operation access needs (which would be replanted with appropriate native grasses and low-growing shrubs), cleared areas would be replanted with trees within one year after completion of construction (note: tree planting is done in the spring of each year).

2.3.7 DECOMMISSIONING

For financial evaluation and contractual purposes, the Whistling Ridge Energy Project is expected to have a useful life of at least 30 years. The trend in the wind energy industry has been to "repower" older wind energy projects by upgrading equipment with more efficient turbines. It is likely that the project would be upgraded with more efficient equipment, and therefore have a useful life longer than 30 years. However, if the project were terminated, the necessary authorization from the appropriate regulatory agencies would be obtained to decommission the facilities. All aboveground facilities would be removed from the site, and unsalvageable material would be disposed of at authorized sites. To avoid unnecessary future ground disturbance and related environmental impacts, the turbine foundations would likely be removed to a depth of three to four feet bgs, and underground electrical cables would likely be abandoned in place. The soil surface would be restored as close as reasonably possible to its original condition. Reclamation procedures would be based on site-specific requirements and forest management techniques commonly employed at the time the area is to be reclaimed, and would include regrading, adding topsoil, and replanting of all disturbed areas. Decommissioned roads would be reclaimed or left in place based on landowner preference, and right of way would be surrendered to the landowner.

2.3.8 CAPITAL AND OPERATING COSTS

The total estimated cost of the Whistling Ridge Energy Project at the completion of construction would be over $150 million, which includes the wind turbines and associated equipment.

Whistling Ridge Energy LLC estimates that the annual operating and maintenance costs would be approximately $3.75 million, including the following:

- Wages and salaries of operation, maintenance, and administrative personnel
- Procurement of goods and services
- Insurance
- Sales and other state and local taxes

SECTION 2.4 ENERGY TRANSMISSION SYSTEMS (WAC 463-60-155)

The project's electrical system would consist of two key elements: (1) a collector system, which would collect energy generated at 575 volts from each wind turbine, transform the voltage to 34.5 kV using a pad-mounted transformer, and deliver the energy via underground cables to (2) the project substation, which would further transform the energy delivered by the underground collector system from 34.5 kV to 230 kV and deliver it, via new interconnection facilities to be built by BPA, to the adjacent existing BPA transmission line and into the regional transmission system. The BPA transmission lines are outside the scope of this application. Please see Section 2.3.3.4 for a more detailed description of the collector system.

No transmission facilities would be constructed by Whistling Ridge Energy LLC.

SECTION 2.5 WATER SUPPLY SYSTEM (WAC 463-60-165)

2.5.1 WATER INTAKE AND CONVEYANCE FACILITIES

Project operations would not require the use of any water for cooling or any other use aside from the limited needs of the Operations and Maintenance facilities. There would be no industrial wastewater stream from the project. Wastewater discharge would come from the Operations and Maintenance building discharging to an on-site septic system. The anticipated use is expected to be less then 5,000 gallons per day for kitchen and bathroom use. Potable water intake would be in the form of a well accommodating the Operations and Maintenance facilities' needs. Whistling Ridge Energy LLC would seek and obtain approval for the new well from EFSEC, in consultation with Skamania County Environmental Health Department and the Washington State Department of Ecology (Ecology). No wastewater would be used, discharged or recycled for wind turbine operations.

2.5.2 WATER SUPPLY AND USAGE ALTERNATIVES

2.5.2.1 Water Supply Alternatives

Due to the low volume of water that would be required for operational use (approximately 5,000 gallons/day), Whistling Ridge Energy LLC did not consider alternatives to reclaim water or other water reuse projects.

2.5.2.2 Water Conservation Methods

The project would not generate process water or any point source discharge to surface waters or ground waters beyond the Operations and Maintenance facilities. The potable water well and septic system provide bathroom and shower facilities to the maintenance personnel. Additional water for daily operational use is minimal and would not result in a long-term increase on current demands. Where appropriate, water use for Operations and Maintenance, and daily operational needs would be minimized.

2.5.3 WATER RIGHTS AND AUTHORIZATIONS

Whistling Ridge Energy LLC is not requesting any new water rights or authorizations beyond the well for the Operations and Maintenance building described above. Operational daily water needs would be acquired from the well, and water needs related to construction would be purchased by the contractor from an off-site vendor with a valid water right and transported to the site in water-tanker trucks. This would be a short-term construction related impact on water use.

2.5.4 PROCESS WATER

No process water would be required for the project beyond daily water needs for the Operations and Maintenance building.

2.5.5 POTABLE WATER

Potable water would be supplied by the well that would be drilled for the Operations and Maintenance facilities.

2.5.6 MITIGATION MEASURES

Mitigation measures and best management practices (BMPs) have been incorporated in the project design features. These measures include avoidance of stream crossings to the maximum extent feasible; complying with federal, state, and local ordinances; and implementing a Stormwater Pollution Prevention Plan (SWPPP) and BMPs during and after construction.

SECTION 2.6 SYSTEM OF HEAT DISSIPATION (WAC 463-60-175)

Pursuant to WAC 463-60-115, Whistling Ridge Energy LLC requests a waiver of the information required by WAC 463-60-175, which calls for a description of the heat dissipation systems.

The heat dissipation from a wind turbine is minimal. Air cooling would be used to cool the operating machinery, such as the generator and gearbox inside the wind turbines, and no water resources would be used.

SECTION 2.7 CHARACTERISTICS OF AQUATIC DISCHARGE SYSTEMS (WAC 463-60-185)

Pursuant to WAC 463-60-115, Whistling Ridge Energy LLC requests a waiver of the information required by WAC 463-60-185, which calls for a description of the discharge to a watercourse. The project would use wind as its source of energy production only. There would be no discharge to a watercourse.

The water use of the proposed facility would be from a small well at the Operations and Maintenance building. This well would provide water for bathroom and kitchen use, as well as for some minor normal maintenance use, and would be expected to consume less then 5,000 gallons per day. Wastewater from the Operations and Maintenance facility would be discharged to a septic tank permitted and installed according to Skamania County Community Development Department standards.

SECTION 2.8 WASTEWATER TREATMENT (WAC 463-60-195)

Pursuant to WAC 463-60-115, Whistling Ridge Energy LLC requests a waiver of the information required by WAC 463-60-195, which calls for a description of wastewater treatment. The project would use wind as its source of energy production only and no water or wastewater would be used or discharged in that process. There would be no wastewater treatment or discharge to a watercourse.

The water use and disposal of the proposed facility would be from a small well at the Operations and Maintenance building. This well would provide water for bathroom and kitchen use, as well as for some minor normal maintenance use, and would be expected to consume less then 5,000 gallons per day. Wastewater from the Operations and Maintenance facility would be discharged to a septic tank permitted and installed according to Skamania County Community Development Department standards.

SECTION 2.9 SPILLAGE PREVENTION AND CONTROL (WAC 463-60-205)

2.9.1 PURPOSE AND SCOPE

This section establishes requirements for a construction spill prevention, control, and countermeasure plan (SPCCP) for activities at the Whistling Ridge Energy Project, as required by the State of Washington Site Certification Agreement, and by state and federal requirements. A revised procedure would be issued as the project moves to operation, or if new requirements or organizational changes require revision. The procedure would be reviewed annually at a minimum, and updates made as needed.

2.9.2 SPILL PREVENTION PLAN

Responsibilities would be established for the construction period, in which the construction contractors would have primary responsibility for overseeing compliance with state and federal environmental regulations and compliance with environmental commitments made to EFSEC. Construction contractor personnel would oversee field activities; coordinate resolution of deviations from BMPs, commitments and regulations; and identify any process changes that could require revision to the environmental procedures.

Whistling Ridge Energy LLC shall have the overall responsibility to ensure compliance with state and federal environmental regulations and compliance with environmental commitments made to EFSEC.

2.9.2.1 Construction Spill Prevention

Fuel and lubricating oils from construction vehicles and equipment and the mineral oil used to fill the transformers are the only potential sources for a spill prevention control program during construction activities. The contractor would be responsible for training its personnel in spill prevention and control and, if an incident occurs, would be responsible for containment and cleanup.

During construction, the contractor would utilize fuel trucks for refueling of construction vehicles and equipment at existing licensed gas stations in nearby communities. There would be no fuel storage tanks used at the project site; instead, fuel trucks would refuel vehicles and equipment. The fuel trucks would be properly licensed.

The project would have up to 50 pad-mounted transformers (one at the base of each wind turbine) which arrive on site pre-filled with mineral oil. As part of the commissioning process of the main substation transformers, they would be filled and tested. The fuel and oil trucks would incorporate features in equipment and operation, such as automatic shut-off devices, to prevent accidental spills. Lubricating oils used during construction would mostly be contained in the vehicles and equipment for which they are used.

A Construction SPCCP would be submitted and approved by EFSEC prior to construction.

2.9.2.2 Operations Spill Prevention

Project operations would not require the use of a permanent fuel storage tank, as fuel use during operations is limited to maintenance vehicle fueling, which would be done at existing licensed gas stations in nearby communities (White Salmon and Hood River). The potential for accidental spills during operation is minimal, as the only materials used during project operations that present any potential for accidental spills are lubricating oils and hydraulic fluids used in the wind turbine generators and transformers.

Table 2.9-1 lists the fluids contained on site, including fluids for the turbines.

Table 2.9-1
Oils, Fuels and Hazardous Materials Anticipated to be Stored at the Whistling Ridge Energy Project Site

Oil (e.g., transformer, lubricating)
Solvents and thinners
Paints
Coatings and sealants
Corrosion inhibitors
Pesticides (herbicides, rodenticides, insecticides, etc.)
Batteries

It is anticipated that an Operation SPCCP would be submitted and approved by EFSEC prior to operation.

Wind Turbine Generator Fluids

Each turbine model has different specification for lubricating oil and hydraulic fluid quantities. There are three main types of fluid in a wind turbine generator: cooling fluid for the generator (a mix of glycol and water, similar to that used in automobile radiators), lubricating oil for the gearbox (typically a synthetic lubricating oil), and hydraulic oil for operating the blade pitch system, yaw mechanism, and brakes.

All of the wind turbine generators being considered for the project are equipped with sensors to automatically detect loss in fluid pressure and/or increases in temperature that enable them to be shut down in case of a fluid leak, as well as fluid catch basins and containment systems to prevent any accidental released from leaving the nacelle. Based on the limited quantities of fluids contained in the wind turbine generators and the leak detection and containment systems engineered into their design, the potential for an accidental spill from wind turbine generator malfunction is extremely limited. Furthermore, any accidental gear oil or other fluid leaks from the wind turbines would be contained inside the turbine towers, which are sealed around the base.

The fluids within the turbines are checked by staff periodically and must be replenished or replaced on an infrequent basis (generally less than once per year and sometimes only once every five years). When replacing these fluids, the typical current practice is for staff to climb up to the nacelle and remove the fluids in small (typically five-gallon) containers and lower them to the ground using a small maintenance crane built into the nacelle itself. The containers would then be transferred to a pickup truck for transport to the Operations and Maintenance facility for

temporary storage (typically less than one month) before being picked up by a licensed transporter for recycling. Replacement fluids are added in the same method, only in reverse. Small quantities of replacement fluids, typically no more than a few 50-gallon drums, of lubricating oil and hydraulic oil may be stored at the Operations and Maintenance facility for replenishing and replacing spent fluids. These fluids would be stored in appropriate containers. All operations staff would be trained in appropriate handling and spill prevention techniques to avoid any accidental spills. Because only small quantities of fluids are transported, added, or removed at any one time and are stored for short periods of time, the potential for an accidental spill during routine maintenance is extremely limited.

Transformer Mineral Oil Coolant

Pad Mounted Transformers. As described in Section 2.3, Construction on Site, each wind turbine generator has a pad mounted transformer located at its base. These transformers contain mineral oil which acts as a coolant. Each pad mounted transformer contains up to 500 gallons of mineral oil. The transformer is designed to meet stringent electrical industry standards, including containment tank weldment and corrosion protection specifications.

Substation Transformer(s). As described in Section 2.4, Energy Transmission Systems, the entire project would be electrically connected to the grid at the BPA substation, which would be equipped with either one or two transformers. Each substation transformer contains up to 12,000 gallons of mineral oil for cooling. The transformer is designed to meet stringent electrical industry standards, including containment tank weldment and corrosion protection specifications. The substation transformers are equipped with an oil level sensor that detects any sudden drop in the oil levels, and sends an alarm message to the central supervisory control and data acquisition (SCADA) system. Finally, the substation transformers are supported by a concrete vault to ensure that any accidental fluid leak does not result in any discharge to the environment.

2.9.2.3 Spill Procedures

Procedures for what to do in the event of a spill shall be developed. These would include actions needed to contain the material in accordance with training received:

- Absorbent booms would be placed around the area of a spill if it is believed that the spill could travel outside immediate area. For spills to the ground, if appropriate for the material spilled, turn soil and use absorbent materials to collect additional spilled material. Contaminated absorbent materials shall be collected and disposed of in accordance with the SPCCP.

- If the spill is large enough to require a cleanup company's assistance, or cleanup requires training beyond level provided to site personnel, a contractor for cleanup services would be hired to perform the work at the responsible party's expense.

- Spills would be reported as required by the SPCCP

- All spills would be reported to EFSEC and Ecology using the guidance provided in the SPCCP.

2.9.2.4 Record Retention

All records pertaining to SPCCP shall be retained on site for a minimum of five years.

SECTION 2.10 SURFACE WATER RUNOFF (WAC 463-60-215)

Surface water runoff without regulated controls can cause the erosion of topsoil, increase sediment load of surface water bodies, and increase the temperature and deteriorate the water quality of receiving creeks. These impacts are mitigated by the requirements of stormwater control programs.

The discharge of stormwater runoff from the Whistling Ridge Energy Project would be regulated by EFSEC based on Ecology's stormwater pollution control program. This program is based on federal regulations adopted to implement Section 402(p) of the Federal Clean Water Act and Chapter 90.48 RCW, the state of Washington's Water Pollution Control Act. The goal of the stormwater program is to reduce or eliminate stormwater pollution from municipal and industrial point sources, by requiring the implementation of a technology-based SWPPP and to eliminate violations of surface water quality standards caused by stormwater.

Whistling Ridge Energy LLC may be required by EFSEC to obtain coverage under the Construction Stormwater General Permit because it would disturb more than one acre of land. Unless if is instructed by EFSEC that it is not necessary to do so, Whistling Ridge Energy LLC would file a notice of intent (NOI) to obtain coverage under the Construction Stormwater General Permit and the Industrial Stormwater General Permit. Even if coverage under this general permit is not required, the Applicant proposes to design and implement the same BMPs to prevent and minimize the discharge of pollutants in its stormwater runoff, and to prepare SWPPPs for the construction and operation of the Whistling Ridge Energy Project in substantially the same form and content.

The final design would conform to the applicable Ecology Stormwater Management Manual in effect at the time or as instructed by EFSEC.

The NOI for construction activities would be filed with EFSEC prior to the start of construction. A SWPPP meeting the conditions of the Stormwater General Permit for Construction Activities also must be prepared and implemented prior to the start of construction activities. The content of the SWPPP for construction activities is addressed in Section 2.10.1.

The NOI for Industrial Activities would be filed with EFSEC if required.

2.10.1 STORMWATER EROSION CONTROL DURING CONSTRUCTION

This section cites specific procedures and requirements that would be implemented at the construction site to reduce the discharge of contaminated stormwater runoff. It includes information on the erosion control practices to be followed during construction at the site (Section 2.10.1.1). Site-specific erosion control plans would be submitted to EFSEC prior to construction.

The main categories of information to be included in the SWPPP are construction BMPs, operating BMPs, construction phase enforcement, and establishment of the Whistling Ridge Energy Project stormwater pollution prevention team.

The SWPPP is most appropriately prepared when design-level topographic surveying and mapping is available, and the final configuration of proposed improvements is overlain on the existing topographic map. The civil site design engineer would establish the locations and types of construction BMPs to be required of the construction contractor, and would include these on an overall map of the site. A narrative section of the SWPPP would describe the intended installation sequence and function of the selected BMPs, and present the sizing calculations. The report also would identify the selected minimum standard to which each of the BMPs are to be constructed or installed. When prepared at this level of detail, the document would meet the requirements of the Stormwater Construction Activity NPDES permit system, and also accurately describe, to the construction contractor, the improvements and actions to be required during construction. The document would be submitted to EFSEC for approval prior to construction. Implementation of the construction BMPs is carried out by the site work contractor, with oversight by environmental monitors.

2.10.1.1 Site Construction

During construction, all new and improved roads would have a 20-foot-wide buffer on one side of the roadway, the maintenance yard and substation plot would have a 50-foot perimeter buffer, turbines would have 300-foot circular buffers, overhead transmission lines would have 50-foot-wide buffers, and underground transmission lines would have 15-foot-wide buffers. Trenches up to 3 feet wide and 3 to 4 feet deep would be dug along access roads for the underground electric cables, with an anticipated 30-foot-wide disturbance area during construction. Trenching would occur simultaneously with roadway construction and improvements to minimize impacts.

Site-specific BMPs for temporary erosion and sedimentation control during construction would be identified on the construction plans submitted to EFSEC, to mitigate impacts associated with construction activities. BMPs would be selected from the applicable Stormwater Management Manual as appropriate for the site slopes, the construction activities, and weather conditions.

The sequence and methods of construction activities would be controlled to limit erosion. Clearing, excavation, and grading would be limited to the minimum areas necessary for construction of the project, and would not be performed far in advance of facility construction. Slopes would be graded to no steeper than 3 feet horizontal (H) to 1 foot vertical (V). Ground surface restoration shall be completed within fourteen days of the area's final disturbance. Interim surface protection measures, such as erosion control blankets or straw matting, also may be required prior to final disturbance and restoration if warranted by the potential for erosion.

Sediment control measures used during construction would be based on a 10-year design storm. Water quality measures (other than sediment removal) would be based on the 6-month, 24-hour design storm.

All construction practices would emphasize erosion control over sediment control through non-quantitative activities such as:

- Straw mulching and vegetating disturbed surfaces
- Retaining original vegetation wherever possible

- Timing grading operations to dry seasons
- Directing surface runoff away from denuded areas
- Keeping runoff velocities low through minimization of slope steepness and length
- Providing and maintaining stabilized construction entrances

In order to prevent erosion and control sediment migration, the following BMPs could be used.

Sediment Traps

Sediment traps are temporary or permanent basins used to intercept stormwater runoff and allow sediment to settle, thereby minimizing the amount of sediment flowing off site. Sizing criteria for the traps include inflow and sediment load. Sediment traps would be sized for the specific disturbed area, for bare soil conditions, and typically for 75 percent sediment removal efficiency.

Silt Fences

Slopes less than 3H:1V would be protected with silt fencing as appropriate. Silt fences would be installed in locations where they would trap silt eroded from slopes during construction and prior to reestablishing vegetation. The maximum flow path to each silt fence would be approximately 100 feet. No concentrated flows greater than 1 cubic foot per second would be directed toward any fence for the 25-year storm. Silt fences would be maintained throughout the construction period, and beyond until disturbed surfaces have been stabilized with vegetation. Silt fence construction specifications including fabric equivalent open size, support spacing, and total length would be determined by local construction conditions during final design of the facilities.

Grade Control Structures and Slope Ditches

Grade control structures such as rock check dams, hay bale check dams, dikes, and swales would be used where appropriate to reduce runoff velocity, as well as to direct surface runoff around and away from cut-and-fill slopes. Swales and dikes also would be used to direct surface water on top of the filled pad toward sediment traps and away from flowing over the bank, which may contribute to sheet and rill erosion.

Matting and Erosion Control Blankets

Depending on weather conditions during the construction period, straw or jute matting or other suitable erosion control blankets would be used on any disturbed slopes to prevent erosion and control sediment migration.

Quarry Spall Construction Entrances

Quarry spall construction entrances would be used to reduce migration of construction dirt to public roads. Placing the construction entrances is one of the first activities required at the site, but the rock bed also must be periodically replenished as it becomes dirty or migrates into the subgrade. All construction traffic would be directed to use the construction entrances.

Chemical Source Control

In addition to erosion and sedimentation control on the site, it is also important to reduce potential for chemical pollution of surface waters during construction. Since source control is the most effective method of preventing chemical water pollution, careful control must be exercised over potentially polluting chemicals used on site during construction. The EPC Contractor with oversight from Whistling Ridge Energy LLC would be responsible for planning, implementing, and maintaining BMPs for:

- Neat and orderly storage of construction chemicals and spent containers in lined, bermed areas
- Prompt cleanup of construction phase spills
- Regular disposal of construction garbage and debris

The SWPPP would identify all areas of potential chemical storage during construction, and provide appropriate control measures.

2.10.2 PERMANENT STORMWATER MANAGEMENT

Vegetation in the project area consists of Grass-forb Stand, Brushfield/Shrub Stand, Conifer-Hardwood Forest, Conifer Forest, and Riparian – Deciduous. The current vegetation conditions are heavily influenced by the commercial forest production activities that occur in the area. The total site area is approximately 1,152 acres; however, stormwater impacts from disturbed areas would be generated from less than 110 acres. Approximately 7.2 miles of gravel roads would be improved, and approximately 2.4 miles of gravel roads would be constructed. During operation, all roads would be maintained to a width of approximately 25 feet, with a 5-foot shoulder on each side, with the exception of roadways adjacent to turbine strings, which would be 40 feet wide with a 25-foot graveled corridor and 5-foot shoulder on each side. The maintenance yard would cover approximately 2 acres, which would include an approximately 3,000-square-foot Operations and Maintenance building and an adjacent gravel parking area for employees, visitors, and equipment. Other additions to the site include a 5-acre gravel substation site, a collector system transformer on a

9'x9' concrete pad, and concrete pads for the approximately 50 wind turbines. These permanently improved areas would cover approximately 55 acres (less than 5% of the total project area).

Permanent stormwater management requires construction of appropriate stormwater hydraulic and treatment facilities, routine maintenance thereof, and prevention of chemical pollution through source control. Whistling Ridge Energy LLC would be responsible for developing, implementing, maintaining, and modifying the SWPPP.

As described above, improvements to the site would cover only a small portion of the project area (less than 5%), most of which would be graveled surfaces. Completely impervious surfaces would be limited to the concrete pads for the turbines and the Operations and Maintenance building, totaling less than one acre. The majority of the improved area is composed of roads or parking surface, which are likely to be compacted over time due to vehicular traffic, causing a decrease in the infiltration capability of those areas. However, some infiltration in those areas is still expected, and they are not classified as impervious. Due to the relatively small areas of impact, site surface water runoff is expected to increase only slightly due to these activities, and considered to be negligible. Vegetated ditches would be installed along roads to provide for hydraulic and treatment facilities. Stormwater would be conveyed via these vegetated roadside ditches and pass through culverts prior to discharging to the natural drainage ways on site. Inlets and outlets of culverts would be stabilized to prevent scour.

Due to the steep nature of the site, some of the improved and constructed roadways would be relatively steep. After construction, until the site has been stabilized, these areas would be most susceptible to erosion and sediment migration. Steep slopes with exposed soil would be seeded with a native mix and protected with mulch or something equivalent until the vegetation is established. Vegetation of disturbed areas and roadside ditches, as well as stabilization of inlets and outlets to culverts, would be the primary permanent stormwater management control measures.

The SWPPP would contain pre-design level of detail for these permanent stormwater BMPs, and would establish the permanent operations stormwater pollution prevention team from appropriate employee categories. Final designs for the permanent BMPs would be incorporated into the final construction plans and specifications prepared by the civil site design engineer. An operations manual for the permanent BMPs would be prepared by the civil site design engineer, if necessary, and the stormwater pollution prevention team members.

The constructed permanent stormwater BMPs would include:

- Vegetated drainage ditches
- Culverts with stabilized inlets and outlets
- Permanent erosion and sedimentation control through site landscaping, grass, and other vegetative cover

Due to the small area of impervious surface in the project area, no detention storage is required.

Runoff treatment BMPs facilities would be designed to conform to the applicable Stormwater Management Manual.

Operational BMPs would be adopted as part of the SWPPP to implement good housekeeping, preventive and corrective maintenance procedures, steps for spill prevention and emergency cleanup, employee training programs, and inspection and record keeping practices as necessary to prevent stormwater pollution.

Examples of good operational housekeeping practices that would be employed at the Whistling Ridge Energy Project site include:

- Neat and orderly storage of chemicals under cover in the Operations and Maintenance facilities
- Prompt cleanup and removal of spillage
- Regular pickup and disposal of garbage and rubbish
- Prevention of accumulations of liquid or solid chemicals on the ground or the floor

At least annually, facility operators would receive spill response training and training in the applicable pollution control laws and regulations. Additional support staff would be trained in the following spill response procedures:

- Recognizing areas that may be affected by a spill and potential drainage routes
- Reporting spills to appropriate individuals
- Employing appropriate material handling and storage procedures
- Implementing spill response procedures

Whistling Ridge Energy Project site operators must periodically review the SWPPP against actual practice. They must confirm that the controls identified in the plan are adequate, and that employees are following them. They must further test and confirm that non-permitted discharges to the stormwater system are not occurring. A summary of these in-house compliance inspections shall be kept with the SWPPP, along with any notifications of non-compliance and reports on incidents such as spills. If the SWPPP has been followed but still proves inadequate to prevent stormwater pollution, Whistling Ridge Energy LLC would amend the SWPPP and seek EFSEC concurrence with the improvements.

2.10.3 PERMANENT WATERWAYS

No perennial streams are located in or adjacent to the Whistling Ridge Energy Project. Five intermittent drainage ways have been identified on site, ultimately draining to the east of the project site. Runoff is conveyed via these drainage ways, and additional ditches in the southwest portion of the site downslope to perennial streams outside the project site that eventually drain to the Columbia River. Additional details regarding water sources and pathways are identified in Sections 3.3, Water and Section 3.5, Wetlands.

SECTION 2.11 EMISSION CONTROL (WAC 463-60-225)

2.11.1 INTRODUCTION

Pursuant to WAC 463-60-115, Whistling Ridge Energy LLC requests a waiver of the information required by WAC 463-60-225 for operation, which calls for a demonstration that the highest and best practicable treatment for control of emissions would be utilized. The air quality impacts from construction of the project would be temporary and minor, and would be limited to vehicle emissions and fugitive dust emissions. No air emissions would be generated from operation of the Whistling Ridge Energy Project, as the operation of wind turbine generators does not involve the combustion of any fuels. The project site is located outside of any air quality non-attainment areas, according to Ecology.

2.11.2 CONSTRUCTION

During construction of the project, the use and operation of construction equipment and vehicles would result in minor air emissions. The main sources of these emissions are expected to be:

- Earth-moving equipment for road construction and site preparation
- Excavating equipment for turbine foundation excavation
- Transport vehicles for delivery of construction materials and equipment
- Worker vehicles
- Small electric generators for on-site power during construction

Fugitive dust emissions would be caused by disturbing the land for construction of project facilities and construction traffic.

The primary types of air emissions are expected to be those typically associated with internal combustion engines, e.g., carbon dioxide, nitrogen oxides, sulfur oxides, carbon monoxide and particulate matter.

2.11.3 OPERATION

The generation of electricity using wind turbines does not produce air emissions. During project operation, small amounts of fugitive dust emissions would be caused by occasional maintenance vehicles traveling on the gravel access roads. However, the number of vehicle trips associated with ongoing Operations and Maintenance would be minor and it is unlikely that the resulting dust would reach nuisance levels or would be substantially different in quantity or type from dust caused by existing logging operations and related traffic.

Operation of the proposed project would not result in emissions that exceed that significant emission rates and would not contribute to violations of the National Ambient Air Quality Standards (NAAQS). Impacts to air quality from project operation would be insignificant.

2.11.4 MITIGATION

All construction and operations vehicles and equipment would comply with all applicable state and federal emissions standards. Measures to control dust during construction would include the use of a dust control agent such as magnesium chloride, or possibly wetting down roadbeds and controlling construction vehicle speeds. Use of a dust control agent would be the preferred method over the use of water as it would also minimize water truck traffic.

The certificate holder would instruct the contractors to minimize the idling of engines when not in active use to minimize emissions.

SECTION 2.12 CONSTRUCTION AND OPERATION ACTIVITIES (WAC 463-60-235)

Whistling Ridge Energy LLC would be responsible for the construction of the Whistling Ridge Energy Project.

2.12.1 INTRODUCTION

The construction of the Whistling Ridge Energy Project would be performed in several stages and would include the following main elements and activities:

- Grading the field construction office area (also used for Operations and Maintenance facilities)
- Constructing site roads, turn-around areas, and crane pads at each wind turbine location
- Constructing the turbine tower foundations and transformer pads
- Installing the electrical collection system – underground and some overhead lines
- Assembling and erecting the wind turbines
- Constructing and installing the substation
- Plant commissioning and energization

The Applicant intends to enter into two primary agreements for the construction of the project: (1) an agreement for the supply, erection and commissioning of the wind turbines, and (2) an Engineering, Procurement, and Construction (EPC) contract for the construction of the balance of the project, which includes all other project facilities and infrastructure such as the roads, electrical collection system, substation, Operations and Maintenance facility, etc. The turbine supplier and the EPC Contractor would be selected during the EFSEC Application review process.

The construction schedules discussed below are based on obtaining a site certificate from Washington EFSEC by ~~April 1,~~October 2010.

The construction schedule would closely follow the construction methodologies discussed in Section 2.14, Construction Methodology.

2.12.2 CONSTRUCTION SCHEDULE AND MILESTONES

Table 2.12-1 identifies the major schedule milestones, engineering and procurement, construction and start-up. Assuming the Governor's approval of the Site Certification agreement in ~~April~~ October 2010, Whistling Ridge Energy LLC anticipates beginning design and construction in ~~2010~~ 2011 and operation by ~~2011~~2012. The construction schedule would be

revised according to the actual approval of the Site Certification Agreement, and a copy provided to EFSEC at least sixty (60) days prior to the start of construction.

Table 2.12-1
Proposed Project Construction Schedule

Task	Start	Finish	Approximate On-Site Manpower
Site Certification Agreement Approved	Target Date	~~4/1/2010~~10/1/2010	
Engineering/Design/Specifications/Surveys	~~2/1/2010~~8/1/2010	~~4/1/2010~~10/1/2010	15
Order/Fabricate Wind Turbines	~~4/1/2010~~10/1/2010	~~8/15/2010~~1/15/2011	0
Order/Fabricate Substation Transformer	~~4/1/2010~~10/1/2010	~~12/1/2010~~5/1/2011	0
Road Construction	4/1/~~2010~~2011	10/1/~~2010~~2011	50
Foundations Construction	6/1/~~2010~~2011	9/1/~~2010~~2011	50
Electrical Collection System Construction	6/1/~~2010~~2011	11/15/~~2010~~2011	50
Substation Construction	4/1/~~2010~~2011	11/15/~~2010~~2011	40
Wind Turbine Assembly and Erection	8/15/~~2010~~2011	2/15/~~2011~~2012	75
Plant Energization and Commissioning	11/15/~~2010~~2011	4/1/~~2011~~2012	25
Plant Substantial Completion	Target Date	4/1/~~2011~~2012	0
Construction Punchlist Clean-Up	2/15/~~2011~~2012	5/15/~~2011~~2012	25

2.12.3 CONSTRUCTION WORKFORCE

During the estimated one-year construction period, approximately 330 workers would be employed. The typical average workforce headcount and construction skills required for the construction of the project is shown in Table 2.12-2.

Table 2.12-2
Construction Staff Breakdown

Task	Project Management and Engineers	Field Technical Staff	Skilled Labor and Equipment Operators	Unskilled Labor	Total Approximate On-Site Manpower
Engineering/Design/Specifications/Surveys/ QAQC	5	10	0	0	15
Road Construction	5	5	30	10	50
Foundations Construction	5	5	25	15	50
Electrical Collection System Construction	2	2	31	15	50
Substation Construction	5	3	28	4	40
Wind Turbine Assembly and Erection	5	6	44	20	75
Plant Energization and Commissioning	3	5	17	0	25
Construction Punchlist Clean-Up	1	1	10	13	25
TOTAL	31	37	185	77	330

Table 2.12.3-3 presents the estimated total workforce resource loading, by month, for the construction of the project. At peak, it is expected that approximately 265 personnel would be on site at once as multiple disciplines of contractors complete their work simultaneously.

Table 2.12-3
Construction Labor Resource Loading

Month Before Commercial Operation	Project Management and Engineers	Field Technical Staff	Skilled Labor and Equipment Operators	Unskilled Labor	Total Approximate On-Site Manpower
14	5	10	0	0	**15**
13	5	10	0	0	**15**
12	10	8	58	14	**90**
11	10	8	58	14	**90**
10	17	15	114	44	**190**
9	17	15	114	44	**190**
8	22	21	158	64	**265**
7	17	16	133	49	**215**
6	12	11	103	39	**165**
5	15	16	120	39	**190**
4	8	11	61	20	**100**
3	8	11	61	20	**100**
2	8	11	61	20	**100**
1	3	5	17	0	**25**
0	1	1	10	13	**25**
Cleanup	1	1	10	13	**25**

See Section 4.4, Socioeconomic Impact for a discussion of where the construction labor force would likely be hired from.

2.12.4 OPERATION

When the project is operational, there would be eight to nine permanent full-time and/or part-time employees on the Operations and Maintenance staff. Table 2.12-4 provides a breakdown of labor categories.

Table 2.12-4
Operations and Maintenance Staff Breakdown

Staff Positions	Number of Operating Personnel
Plant Site Manager	1
Operations Manager	1
Operating Technicians	4 - 5
Administrative Manager	1
Administration Assistant	1
TOTAL FOR WHISTLING RIDGE ENERGY PROJECT	**8-9**

SECTION 2.13 CONSTRUCTION MANAGEMENT (WAC 463-60-245)

2.13.1 CONSTRUCTION MANAGEMENT ORGANIZATION

Whistling Ridge Energy LLC would enter into two primary agreements for the construction of the project: (1) agreement for the supply, erection and commissioning of the wind turbines, and (2) an EPC contract for the construction of the balance of the project, which includes all other Project facilities and infrastructure such as the roads, electrical collection system, substation, Operations and Maintenance facility, etc.

2.13.1.1 Project Construction Management

The project management organizational structure would include two support groups: an engineering and design specifications team and the field site management team. Figure 2.13-1 illustrates the construction management organizational structure for the project. The Project Manager would handle contractual aspects of the agreements with the project managers of the wind turbine vendor and the EPC contractor. This organization chart represents a typical structure for wind power projects. The exact organization may change after award of the turbine supply contract, EPC contract, or other subcontracts.

2.13.1.2 Engineering and Design Specifications Team

The engineering and design specifications team would be responsible for establishing the design and construction specifications for the various portions of the project. The engineering team acts as a third party verification group in conjunction with the project's field quality assurance/quality control (QA/QC) team. The engineering team would review proposals from the various turbine suppliers and EPC contractors for equipment supply and construction work. The turbine supplier and EPC contractor would be responsible for the detailed design work for the project and for submitting these designs and equipment specifications to the project engineering team for review. Review by the project engineering team would ensure that the detailed construction plans would meet the required design specifications, codes, and standards for the project.

2.13.1.3 Field Site Management Team

The field site management team would oversee construction on site and ensure that construction on site is performed in accordance with the engineering plans and specifications, environmental requirements and good industry practice. The field site team would generally be involved in day-to-day issues that arise throughout the construction phase. The Project Site Manager would have a support team consisting of QA/QC specialists, environmental inspectors, and site safety officers. The site team also would rely on the engineering team for support in the field during critical operations such as energizing of the substation and any technical issues that arise during project construction.

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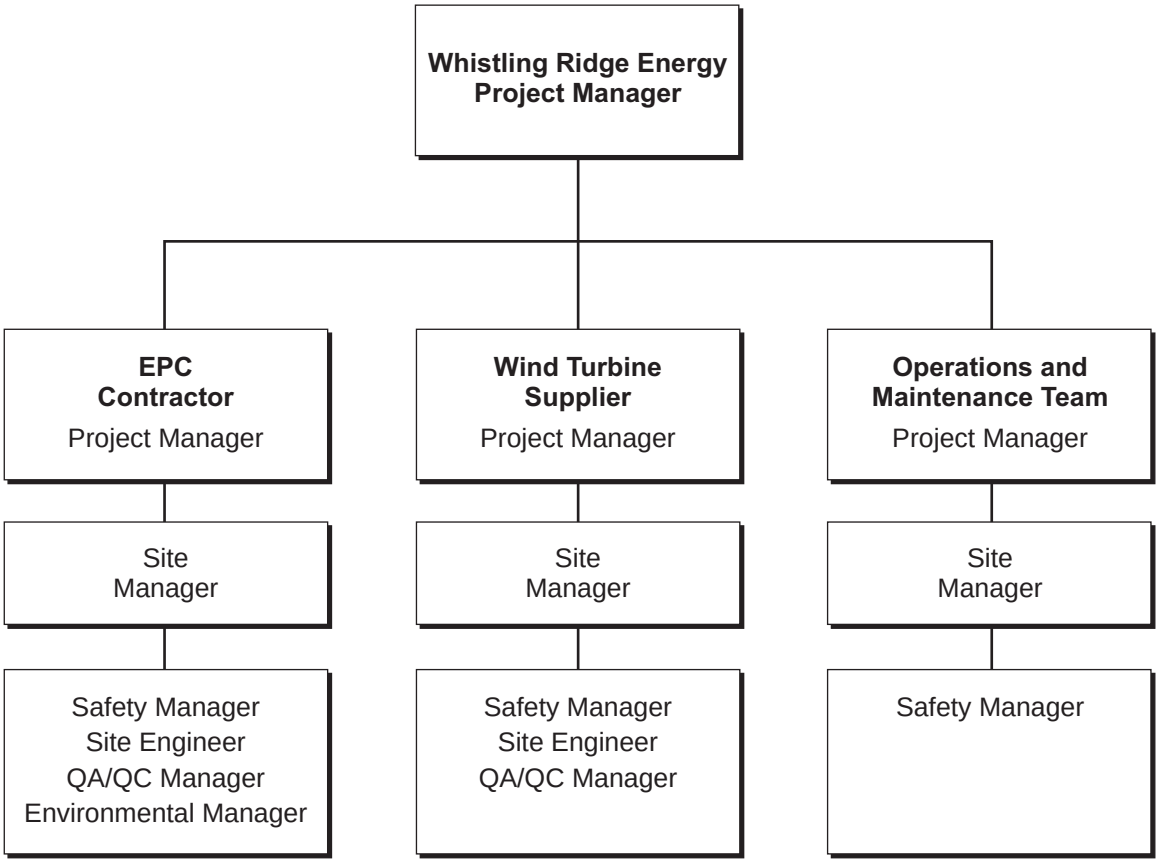

Figure 2.13-1

Project Construction Management Organizational Structure

Job No. 33758687

URS

Whistling Ridge Energy Project
Skamania County, Washington

2.13.1.4 EPC Contractor's Construction Management Team

The EPC Contractor would be responsible for managing several construction subcontractors including those for the balance of plant items, such as the roads, electrical and communications system infrastructure, substation and Operations and Maintenance facility. The EPC Contractor would have a lead Project Manager, a Project Engineer, and a Site Manager supported by their field engineering team, QA/QC specialists, environmental monitors, and site safety officers. The EPC Contractor would be required to implement and perform a safety plan, a QA/QC plan and an environmental protection plan, including the SWPPP.

2.13.1.5 Wind Turbine Vendor's Construction Management Team

The wind turbine supplier would be responsible for the supply, delivery, erection and commissioning of the wind turbines. The turbine supplier's construction team would include a lead Project Manager, a Site Manager, transportation specialists, and several lead technicians. The turbine vendor's site team would be supported by their own QA/QC specialists and site safety officers. The EPC Contractor would be required to implement and perform a safety plan, a rigorous QA/QC plan, and a detailed commissioning plan.

2.13.1.6 Project Operations and Maintenance Team

The project Operations and Maintenance group would be on site during the commissioning and start-up phase of construction. Once a turbine is commissioned, it is turned over to the Operations and Maintenance group control. The Operations and Maintenance team generally consists of a Project Site Manager, a team of wind turbine field technician specialists, and an administrative support staff.

2.13.2 SAFETY PROGRAM

Prior to the commencement of any construction work, the EPC Contractor would be required to prepare a safety plan that would apply to EPC Contractor personnel and all subcontractor personnel working at the site. The plan would be designed to ensure compliance with all laws, ordinances, regulations, and standards concerning health and safety. The EPC Contractor would have a safety manager with the authority to issue a "stop work" notice when health and safety issues are violated, including any subcontractor safety issues, and the health and safety of construction personnel are in danger. Upon identification of a health and safety issue, the safety manager would work with the responsible department or subcontractor to correct the issue.

2.13.3 ENVIRONMENTAL PROTECTION PROGRAM

The environmental compliance program would ensure that construction activities meet the conditions, limits, and specifications set in environmental standards established in the Site Certification Agreement and all other environmental regulations.

Copies of all applicable construction permits would be kept on site. The lead project construction personnel and construction Project Managers would be required to read, follow, and

be responsible for all required compliance activities. A project Environmental Monitor would be responsible for ensuring that all construction permit requirements are adhered to, and that any deficiencies are promptly corrected. The Environmental Monitor also would have the authority to stop work. The environmental compliance program would cover avoidance of sensitive areas during construction, waste handling and storage, stormwater management, spill prevention and control, and other components required by State and County regulations.

2.13.4 TRAINING PROGRAMS

Each EPC Contractor would be required to have a training program to ensure that safety and environmental regulations and permits are followed. The program would include training on:

- Drug and alcohol free workplace policy
- Personal health and safety
- Fall safety
- Confined space
- Excavation
- Crane and rigging
- Equipment and operations safety
- Fire prevention
- Electrical safety
- Emergency response
- Hazards communication
- Stormwater pollution prevention
- SPCCP
- Uptower rescue plan

During operations, personnel would receive initial and annual training. In addition to training to support proficiency on the Operations and Maintenance required for the facility, personnel would receive training related to health and safety, hazards communication, stormwater pollution prevention, and SPCCP.

2.13.5 QUALITY CONTROL SYSTEMS AND RECORD KEEPING

A QA/QC program would be implemented during all phases of the project to ensure that the engineering, procurement, construction, and startup of the facility are completed as specified. The elements of the QA/QC program would include:

- A formal QA/QC program would be in place to ensure that the equipment suppliers deliver their components as designed and specified and that the installation of equipment is completed as specified.

- A procedures manual would be developed that describes Whistling Ridge Energy Project activities from the initiation of final design activities through startup of the plant.

- The EPC Contractors would describe the activities and responsibilities within their organizations, and measures taken to assure quality work. Some of the topics would include design control, configuration management, and drawing control.

- Independent QA/QC personnel would review all documentation and witness field activities as a parallel organization to that of the construction organization to assure compliance with the specifications.

- Field inspectors' acceptance would be required for the installation, alignment, and commissioning of all major equipment.

Typical QA/QC checks include:

- Factory QA/QC
  - Inspection of major equipment at manufacturer's facilities
  - Review and inspection of third party test verification reports
  - Review and inspection of manufacturer's QA/QC procedures
  - Manufacturing drawing review and verification
  - Visual inspection
  - Witness and/or review of testing
  - Verification of welding procedure specifications compliance
  - Inspection of flange interface flatness measurements, finishing, and protection
  - Witness or review of turbine run-in load testing
  - Inspection of paint finishing and protection
  - Shipment packaging and handling, tracking, and identification
  - Pre-commissioning field testing and verification

- Field Inspection QA/QC
  - Reviewing equipment and material delivery acceptance inspection procedures
  - Inspection of all critical interfaces
  - Verification of all mechanical assembly work including erection of major components

  - Verification of field wiring and tagging
  - Pre-commissioning field testing and verification

- Concrete/Structural
  - Inspection of forms, structural steel, and rebar prior to backfilling and prior to casting
  - Field engineer's witness of concrete pouring
  - Inspection of concrete testing during pour (slump) and verification of break test results

- Roads
  - Field verification of road locations to site plan and survey markings
  - Review of clearing process (if necessary)
  - Verification of adequate road materials and compaction to engineer's specifications
  - Verification of road grade to plans

- Electrical Collection System
  - Inspection of cables and trenches prior to burial and backfilling
  - Witness of proper backfilling procedures
  - Inspection of terminations and termination hardware
  - Witness and/or review of polarity, cable marking, and phase rotation tests
  - Witness and/or review of grounding system resistance measurements
  - Inspection of all lock-out/tag-out locations and energizing sequences and plan

- Transformers
  - Inspection of transformers at manufacturer's facilities
  - Witness and/or review of winding resistance, polarity and phase displacement tests
  - Witness and/or review of no load losses and excitation current at rated voltage and frequency
  - Witness and/or review of impedance voltage and load losses at rated current and rated frequency
  - Witness and/or review of high potential and induced potential tests
  - Witness and/or review of impulse tests, reduced full wave, chopped wave and full wave tests
  - Witness and/or review of regulation and efficiency calculations
  - Verification of compliance to engineering specifications
  - Inspection of painting/tagging/preparation for shipment
  - Verification of field wiring and tagging

- Breakers
  - Witness and/or review of rated continuous current and short circuit tests
  - Witness and/or review of dielectric withstand tests

- Witness and/or review of switching tests
- Witness and/or review of insulator tests
- Witness and/or review of mechanical life tests
- Witness and/or review of terminal loading tests
- Witness and/or review of partial discharge tests
- Verification of compliance to engineering specifications
- Inspection of painting/tagging/wiring/preparation for shipment
- Verification of field wiring and tagging

Whistling Ridge Energy LLC would periodically audit the EPC Contractor, including reviews of documentation and surveillances of field activities, to ensure compliance with the specifications and with the requirements of the QA/QC plan. Checks may include:

- Verification of drawings
- Verification of materials
- Verify compliance to engineering specifications
- Verify compliance with environmental permits and regulations
- Verify compliance with health and safety program

Records would be maintained at the on-site Operations and Maintenance building in accordance with Whistling Ridge Energy LLC's records management program and state archivist requirements.

SECTION 2.14 CONSTRUCTION METHODOLOGY (WAC 463-60-255)

2.14.1 CONSTRUCTION SUMMARY

The proposed Whistling Ridge Energy Project would be located on private commercial forestland owned by S.D.S Co., LLC and Broughton Lumber Company in an unincorporated area of Skamania County, approximately 7 miles northwest of the City of White Salmon. Several private logging roads exist around the site. The project site is composed of complexes of very deep soils that formed in alluvium, colluvium, and residuum weathered primarily from basalt and mixed with volcanic ash (USDA NRCS 2003). The land is in commercial forest production and has been harvested.

Stormwater pollution prevention activities would occur prior to any clearing and site preparation. Measures would include installation of a stabilized construction entrance, wheel wash, silt fences, hay bales, temporary and/or permanent water conveyance systems, and installation of temporary and/or permanent retention ponds.

Before construction can commence, a site survey would be performed during the micrositing process to stake out the exact location of the wind turbines, the site roads, electrical cables, access entryways from public roads, substation areas, etc.

Once the surveys are complete, a detailed geotechnical investigation would be performed to identify subsurface conditions which would dictate much of the design work of the roads, foundations, underground trenching and electrical grounding systems. Typically, the geotechnical investigation involves a drill rig which bores to the engineer's required depths (typically 8 inch diameter drill to 30-40 feet deep) and a backhoe to identify the subsurface soil and rock types and strength properties by sampling and lab testing. Testing is also done to measure the soil's electrical properties to ensure proper grounding system design. A geotechnical investigation is generally performed at each turbine location, the substation location and at the Operation and Maintenance building location.

During construction, foundations would be installed, followed by installation of the equipment and construction of the Operations and Maintenance building. Approximately 5,000 amperes of 480-volt, three-phase temporary power would be installed within the site boundary to supply construction power. Startup power would be obtained by a step down transformer located adjacent to the high voltage switching station.

Field toilets and temporary holding tanks would be placed on site for use by construction personnel. During construction, potable water would be provided in containers until the potable water supply system is installed.

Construction worker parking would be provided primarily at the Operations and Maintenance/construction office area and throughout the project area where major activities are occurring. Materials to be used during construction are expected to be staged primarily at the

Operations and Maintenance building complex within a fenced storage yard and in two to three other areas to be determined after site surveys are completed.

2.14.2 SITE PREPARATION AND ROAD CONSTRUCTION

Preliminary analysis by URS Corporation indicates that the potential for liquefaction is very low at this site. Based on test pits and field observations, unconsolidated soils extend up to 3 feet below ground surface. The surficial soils are primarily characterized as soft, moist sandy silt, clay and sand. Immediately beneath the unconsolidated soils, rock with variable strength and weathering properties is present. It is anticipated that rock quality of the basalts would improve with depth but that weaker interflow zones consisting of volcaniclastic material and paleosols are possible at any depth. Prior to final design and location of the tower foundations, additional subsurface investigations (boreholes) would be required to provide geotechnical data at foundation and anchor depths. The final determination of foundation type would be determined by the EPC contractor's geotechnical engineer in consultation with the turbine manufacturer.

During site preparation, the contractor would install storm water pollution prevention measures. Dust would be controlled as needed by spraying water on dry, exposed soil. A Certified Erosion and Sediment Control Lead would be responsible for ensuring that storm water pollution prevention measures meet BMPs in accordance with the most recent version of Ecology's applicable Stormwater Management Manual.

Roadway access would be provided using Cook-Underwood Road to Willard Road. A new connection would be made directly from Willard Road to West Pit Road and West Pit Road would be improved. West Pit Road is an existing private logging road of approximately 2.5 miles in length. West Pit Road was originally built to enable large trucks and logging equipment to access the project site for ongoing commercial logging purposes. This road was generally 8 to 12 feet wide, however improvements were made during summer 2009 for logging purposes to widths between 20 and 26 feet. Improvements to allow use by construction vehicles generally would involve additional widening to the roadway and the existing culvert, widening of some corners, and providing a gravel all-weather surface. West Pit Road would be widened to approximately 25 feet (width of finished road), with an additional 5 feet of shoulder on either side to provide access to the site by construction vehicles, and to continue to provide access for logging activities.

The project roads would be gravel surfaced and generally designed with a low profile. Road construction would be performed in multiple passes starting with the rough grading and leveling of the roadway areas, if necessary. Once rough grade is achieved, a fabric layer would be installed, base rock would be trucked in, spread and compacted to create a road base. A capping rock would then be spread over the road base and roll-compacted to finished grade.

There are two existing quarry pits, one located on site and one on the project boundary along West Pit Road (see Figure 2.3-1). Both are under 3 acres in size and were established to support the commercial forestry use. There is a potential that some rock used for roadway surfacing of West Pit Road may come from one or both of these quarry pits. The quarries will remain at or below 3 acres in size, and West Pit Road will continue to be used for forest access. Alternatively, rock would be hauled in from off-site commercial quarries.

Excavated soil and rock that arises through grading would be spread across the site to the natural grade and would be reseeded with native grasses to control erosion by water and wind. Approximately 50 percent of excavated soils are anticipated to be too large for re-use as backfill at foundations. These larger cobbles would be crushed into smaller rock for use as backfill or road material or disposed of off-site. Those materials that cannot be reused on site would be disposed of in accordance with Skamania County and Ecology regulations for clean fill materials.

2.14.3 FOUNDATION CONSTRUCTION

The Project would require several foundations including bases for each turbine and pad transformer, and the Operations and Maintenance facility. Often, separate subcontractors are mobilized for each type of foundation they specialize in constructing.

Foundations and buildings would be designed for Seismic Zone 2. The initial phase of foundation construction would include foundations for all heavy equipment except for transformers and other electrical switchyard foundations, which would be constructed at a later time.

The presence of relatively shallow rock indicates that the proposed structures would be supported on rock anchored mat-slab foundations. Foundation construction would occur in several stages including drilling, blasting and hole excavation, outer form setting, rebar and bolt cage assembly, casting and finishing of the concrete, removal of the forms, backfilling and compacting, construction of the pad transformer foundation, and foundation site area restoration.

Excavation and foundation construction would be conducted in a manner that would minimize the size and duration of excavated areas required to install foundations. Portions of the work may require over excavation and/or shoring. Foundation work for a given excavation would commence after excavation of the area is complete. Backfill for the foundations would be installed immediately after approval by the engineer's field inspectors. The Applicant plans on using on-site excavated materials for backfill to the extent possible.

Based on preliminary calculations and depending on the type of foundation design used, approximately 20 cubic yards of excavated soil would remain from each turbine foundation excavation. The excess soils not used as backfill for the foundations would be used to level out low spots on the crane pads and roads consistent with the surrounding grade and reseeded with a designated mix of grasses and/or seeds around the edges of the disturbed areas. Larger cobbles would be disposed of off-site, or crushed into smaller rock for use as backfill or road material. All excavation and foundation construction work would be done in accordance to a formal SWPPP for the project as outlined in Section 2.10, Surface Water Runoff.

Construction of foundations would require the use of a number of types of heavy equipment, including excavation equipment, concrete-pumping equipment, and concrete finishing equipment. In addition, light and medium duty trucks, air compressors, generators, and other internal combustion engine driven equipment are anticipated.

The EPC contractor, in consultation with the Applicant, would determine the need for an on-site concrete batch plant, rock quarries, and rock crushers.

2.14.4 ELECTRICAL COLLECTION SYSTEM CONSTRUCTION

Once the roads and turbine foundations and transformer pads are complete for a particular row of turbines, underground cables would be installed on the completed road section. If any unanticipated environmental, geological, or historic constraints are discovered, limited portions of above-ground electrical collection lines may be proposed. A trench is cut to the required depth with a rock trencher. Clean fill would be placed above and below the cables for the first several inches of fill to prevent cable pinching. All cables and trenches would be inspected before backfilling. Once the clean fill is covering the cables, the excavated material would then used to complete the backfilling. Blasting would be used in areas where solid rock is encountered close to the surface, or a shallower trench would be cut using rock cutting equipment and the cables may be covered with a concrete slurry mix to protect the cables and comply with code and engineering specifications if site conditions warrant such coverage.

The high voltage underground cables are fed through the trenches and into conduits at the pad transformers at each turbine. The cables run to the pad transformers' high voltage (34.5 kV) compartment and are connected to the terminals. Low voltage cables are fed through another set of underground conduits from the pad transformer to the bus cabinet inside the base of the wind turbine tower. The low voltage cable would be terminated at each end and the whole system would be inspected and tested prior to energization.

For overhead transmission, once the survey and design work are done, the installation of poles and cross-arms to support the conductors can commence. The poles are first assembled and fitted with all of their cross-arms, cable supports and insulator hardware on the ground at each pole location. Holes for each pole would then be excavated or drilled and the poles would be erected and set in place using a small crane or boom truck. Once it is set in place, concrete would be poured in place around the base of the pole, or clean fill would be compacted around the tower base according to the engineer's specifications. The overhead lines would connect to underground cables at each end through a switchable, visible, lockable riser disconnect with fuses.

Excavated soil and rock that arises through grading would be spread across the site to the natural grade and would be reseeded with native grasses to control erosion by water and wind. Approximately 50 percent of excavated soils are anticipated to be too large for re-use as backfill at foundations. These larger cobbles may be crushed into smaller rock for use as backfill or road material or disposed of off-site. Those materials that cannot be reused on site would be disposed of in accordance with Skamania County and Department of Ecology regulations for clean fill materials. All excavation, trenching and electrical system construction work would be done in accordance to a SWPPP for the project as outlined in Section 2.10, Surface Water Runoff.

The electrical construction work would require the use of several pieces of heavy machinery including a track-hoe, a rock trencher, rock cutting equipment, front-end loaders, drill rigs for the pole-line, dump trucks for import of clean back fill, transportation trucks for the materials, small cranes and boom trucks for off-loading and setting of the poles and pad transformers, concrete

trucks, cable spool trucks used to un-spool the cable, man-lift bucket trucks for the pole-line work and a winch truck to pull the cable from the spools onto the poles.

2.14.5 WIND TURBINE ASSEMBLY AND INSTALLATION

The wind turbines consist of three main components: the towers, the nacelles (machine house) and the rotor blades. Other smaller components include hubs, nose cones, cabling, control panels and tower internal facilities such as lighting, ladders, etc. All turbine components would be delivered to the Project site on flatbed transport trucks and main components would be off-loaded at the individual turbine sites.

Turbine erection is performed in multiple stages including: setting of the bus cabinet and ground control panels on the foundation, erection of the tower (usually in 3-4 sections), erection of the nacelle, assembly and erection of the rotor, connection and termination of the internal cables, and inspection and testing of the electrical system prior to energization.

Turbine assembly and erection involves mainly the use of large truck or track mounted cranes, smaller rough terrain cranes, boom trucks, rough terrain fork-lifts for loading and off-loading materials and equipment, and flat bed and low-boy trucks for transporting materials to site.

In sequence with the installation of component equipment, support systems would be installed, including electrical equipment, control equipment, piping installation, wiring cable, and conduits. Typical construction activities would include mechanical fastening, welding, preparation, and painting.

2.14.6 STARTUP TESTING

At the completion of the construction sequence, each system would be energized and operational testing undertaken. This would include testing of each of the major component systems in a predetermined sequence and completion of QA/QC checks to ensure that each system is ready for full operation. At the end of the startup testing phase, each unit would be separately certified for commercial operation.

2.14.7 PROJECT CONSTRUCTION CLEAN-UP

Since project clean-up generally consists of landscaping and earthwork, it is very weather and season sensitive. Landscaping clean-up is generally completed during the first allowable and suitable weather conditions after all of the heavy construction activities have been completed. Disturbed areas outside of the graveled areas would be reseeded to control erosion by water and wind. To the extent feasible for the Project, cleared areas would be reforested in accordance with typical commercial forestry management practices. All construction clean-up work and permanent erosion control measures would be done in accordance to a SWPPP for the Project as outlined in Section 2.10, Surface Water Runoff.

Other project clean-up activities may include interior finishing of the Operations and Maintenance building, landscaping around the substation area, washing of towers, painting of scratches on towers and exposed bolts as well as other miscellaneous tasks that are part of

normal construction clean-up. Construction clean-up would require the use of a motor grader, dump trucks, front-end loaders, and light trucks for transportation of any waste materials, packaging, etc.

SECTION 2.15 PROTECTION FROM NATURAL HAZARDS (WAC 463-60-265)

2.15.1 INTRODUCTION

This section describes conditions that exist on site or measures that are planned as part of the Whistling Ridge Energy Project design to protect the facility from natural hazards.

2.15.2 EARTHQUAKE HAZARD

Earthquake-related damage to industrial facilities, such as the Whistling Ridge Energy Project facility, typically arises from surface fault rupture, liquefaction and lateral spreading of soils, slope failures, or ground shaking. In addition, tsunamis or seiches may impact facilities located near the Pacific Coast or adjacent to other water bodies in seismically active areas. Due to the project site location and elevation, impacts from tsunamis or seiches are not expected to occur.

The Pacific Northwest has four types of seismic sources due to the presence of the Cascadia subduction zone: (1) the subduction zone megathrust, which represents the boundary (interface) between the subducting Juan de Fuca plate and the overriding North American plate; (2) faults located within the Juan de Fuca plate (referred to as the intraplate or intraslab region); (3) crustal faults principally in the North American plate; and (4) volcanic sources beneath the Cascade Range (Wong and Silva 1998). Each of these events has different causes, and therefore produces earthquakes with different characteristics (that is, peak ground accelerations, response spectra, and duration of strong shaking).

Because of their proximity, crustal faults are possibly the most significant seismic sources to inland sites. Studies by Pezzopane (1993) and Geomatrix Consultants (1995) show that at least 70 crustal faults with earthquake potential exist in southwest Washington and northwest Oregon. Many of these faults were unknown or not recognized as being seismogenic a decade ago. Although the largest known crustal earthquake in southwest Washington and western Oregon is only about moment magnitude ($M_{w)}$ 6 (Wong and Bott 1995), potential exists for events of M_w 6.5 or greater along several recognized faults including the Portland Hills and the recently discovered East Bank faults in Portland and the Gales Creek-Mt. Angel fault zone.

2.15.2.1 Surface Fault Rupture

Coseismic surface rupture occurs when a fault breaks to the land surface during an earthquake. Surface rupture is usually associated with moderate to large earthquakes (magnitude 6.5 or greater) or, rarely during smaller, very shallow events. Surface rupture is highly unlikely at the project site because of the absence of known faults beneath the site and the absence of evidence of historical or geologically recent surface rupture in the project site area. No surface fault movement has been recorded in Washington within historic time (McCrumb et al. 1989, Rogers et al. 1996, Lidke et al. 2003). In general, faults that have had a surface rupture during the Holocene epoch (last 10,000 years) or multiple ruptures during the Pleistocene epoch of the Quaternary period (last 10,000 to 1.8 million years) are considered to have a potential for future surface rupture. The known faults with Holocene or late Pleistocene surface displacement within the Puget Sound and Willamette lowlands are distant from the site. No Quaternary faults have

been previously mapped or inferred within the site boundaries (Walsh et al. 1987, Noson et al. 1988, Rogers et al. 1996, Lidke et al. 2003). Due to the lack of recognized Quaternary faults at the project site, the potential for surface fault rupture is considered remote.

2.15.2.2 Strong Ground Motion

The southwestern Washington and northwestern Oregon region, in which the project site is situated, is an area of low to moderate historical seismicity but characterized as one of high seismic hazard due to the potential for strong earthquake ground motion (see Section 3.1.3, Seismicity) from regional potential seismic sources. These sources include the Cascadia Subduction Zone (CSZ) located offshore of the west coast of the US, deep intraplate earthquakes beneath the site vicinity within the subducted plate slab, and shallow crustal faults from the Puget Sound and Willamette lowlands and eastward. According to the US Geological Survey (USGS) probabilistic Seismic Hazard Maps published in 2008 (Peterson et al. 2008 and http://earthquake.usgs.gov/research/hazmaps/), the estimated peak ground acceleration for the site is on the order of 0.18g for a 475-year return period earthquake (10 percent chance of being exceeded in 50 years). For a 2,475-year return period earthquake (2 percent of being exceeded in 50 years), the estimated peak acceleration for the site is on the order of 0.40g. Design of facilities for the USGS estimated levels and potentially higher levels of ground shaking can be accommodated within the current level of earthquake engineering design practice and applicable building codes.

2.15.2.3 Liquefaction and Lateral Spreading

Liquefaction is a phenomenon whereby soils undergo significant loss of strength and stiffness when they are subjected to vibration or large cyclic ground motions produced by earthquakes. Typically, cyclic loading of saturated soils leads to the buildup of excess pore-water pressure as a result of soil particles being rearranged with a tendency toward denser packing. Under undrained conditions (such as during earthquake shaking), loads are transferred from the soil skeleton to the pore-water with consequent reduction in the soils' shear strength.

Saturated granular soils without cohesive fines (i.e., gravels, sands, and silts) are most susceptible to liquefaction. Other factors affecting the potential for liquefaction in soils are density, amplitude of loading, confining pressure, past stress history, age of soil deposit, the size, shape and gradation of particles, and the soil fabric structure. Liquefaction-induced ground settlement and lateral spreading have been the primary cause for extensive damage to aboveground structures, foundations, and pipelines during many earthquakes.

Test pits excavated at the project site encountered shallow bedrock covered with a combination of cohesive and cohesionless soil. No groundwater was observed in any of the test pits. Based on the soils encountered during the field explorations, it is URS's opinion that the potential for liquefaction at this site is very low.

The risk of seismically inducted settlement and lateral spreading is low due to the low liquefaction potential. It is URS's opinion that settlements and lateral spread induced by a seismic event would be minimal. If, during additional subsurface investigations at the site, liquefiable soils and high groundwater are observed, design of the facilities can be

accommodated within the current level of earthquake engineering design practice and applicable building codes.

2.15.2.4 Tsunamis and Seiches

Tsunami waves may enter the Columbia River from distant circum-Pacific earthquakes, local offshore earthquakes on the CSZ, or submarine landslides in the adjacent Pacific Ocean offshore area. The project site is located on a series of north-trending ridges that range in elevation from approximately 2,100 to 2,300 feet above msl and would be above the area potentially affected by a tsunami wave.

Although seiches have been observed in the Pacific Northwest during the 1949 Queen Charlotte Islands, Canada, and the 1964 and 2002 Alaskan earthquake of approximately M_w 8 or greater, seiches have not been reported in the Columbia River, except in the reservoir directly behind the Grand Coulee Dam farther upstream. In our judgment, the seiche potential in this river near the site is minimal, and, due to the elevation of the site, the potential for damage from any seiche that might occur is considered to be remote.

2.15.2.5 Mitigation Measures for Earthquake Hazards

All structures on the site would be built in accordance with the seismic design provisions presented in the 2006 version of the International Building Code (IBC), and the American Society of Civil Engineers 07-05 standard. The site soil is best represented as Stiff Soil (Soil Site Class D). Based on the site location and site conditions described above, we recommend that the values listed in Table 2.15-1 be used for seismic design of the project in accordance with Section 1613.5.3 of the 2006 IBC. The occupancy category of the proposed structure is assumed III as per Section 1613.5.6 of the 2006 IBC.

Table 2.15-1
2006 IBC Seismic Design Values

Parameter	Value	2006 IBC/ASCE 7-05 Reference
Soil Profile Site Class	C	Table 1613.5.2
0.2 Second Spectral Acceleration S_s	0.60 g	Figure 1613.5 (1)
1.0 Second Spectral Acceleration S_l	0.20 g	Figure 1613.5 (2)
Peak Ground Acceleration ($0.4S_{Ds}$)	0.186 g	ASCE 7-05 equation 11.4-5
Site Coefficient F_a	1.16	Table 1613.5.3 (1)
Site Coefficient F_v	1.6	Table 1613.5.3 (2)
Seismic Design Category[a]	D	Tables 1613.5.6 (1) & (2)

a. Assumes Seismic Use Group III

A visual inspection would be conducted following abnormal seismic activity. These inspections would look for signs of incipient mass movement in those areas identified as potentially susceptible to such failures.

2.15.3 SLOPE FAILURE AND MASS WASTING

Pursuant to Skamania County Code (SCC) Title 21A, Chapter 21A.06 - Landslide Hazard Areas, URS has conducted a preliminary landslide hazard evaluation of the proposed Whistling Ridge Energy Project wind turbine site. The project location is shown in Figure 3.1-1, Site Geology.

A URS Licensed Engineering Geologist conducted a site-specific landslide hazard investigation. The investigation consisted of:

- Review of Sections of the County Code that address Geologically Hazardous Areas
- Review of existing available topographic, geologic and soils literature and maps
- Analysis of project-specific stereo aerial photographs
- Review of project test pit logs and soil samples
- A one day site reconnaissance

According to the County Code, the primary criteria for landslide hazard designations are: presence of pre-existing, known mappable landslides; slope angle; and/or composition of the near-surface soils or rock.

URS has created a color-coded map of the study area using an existing USGS 10 meter digital terrain model (DTM) to segregate slopes into three categories: slopes less than 20%; slopes between 20% and 30%; and slopes greater than 30%. We then superimposed the Natural Resources Conservation Services (NRCS) soil survey map onto the slope map to provide soil type information. The resulting Landslide Hazard Map is presented herein as Figure 2.15-1.

2.15.3.1 Landslide Hazard Area Delineation

Skamania County recognizes three classes of landslide hazard areas (LHAs). Class I (Severe) LHAs are considered to present a severe landslide hazard and are distinguished as areas of known mappable landslide deposits which have been designated landslide hazard areas by the local legislative body. Class II (High) LHAs are areas with slopes between twenty and thirty percent that are underlain by soils that consist largely of silt, clay or bedrock, and all areas with slopes greater than thirty percent. Class III (Moderate) LHAs are areas with slopes between twenty percent and thirty percent not included in Class II.

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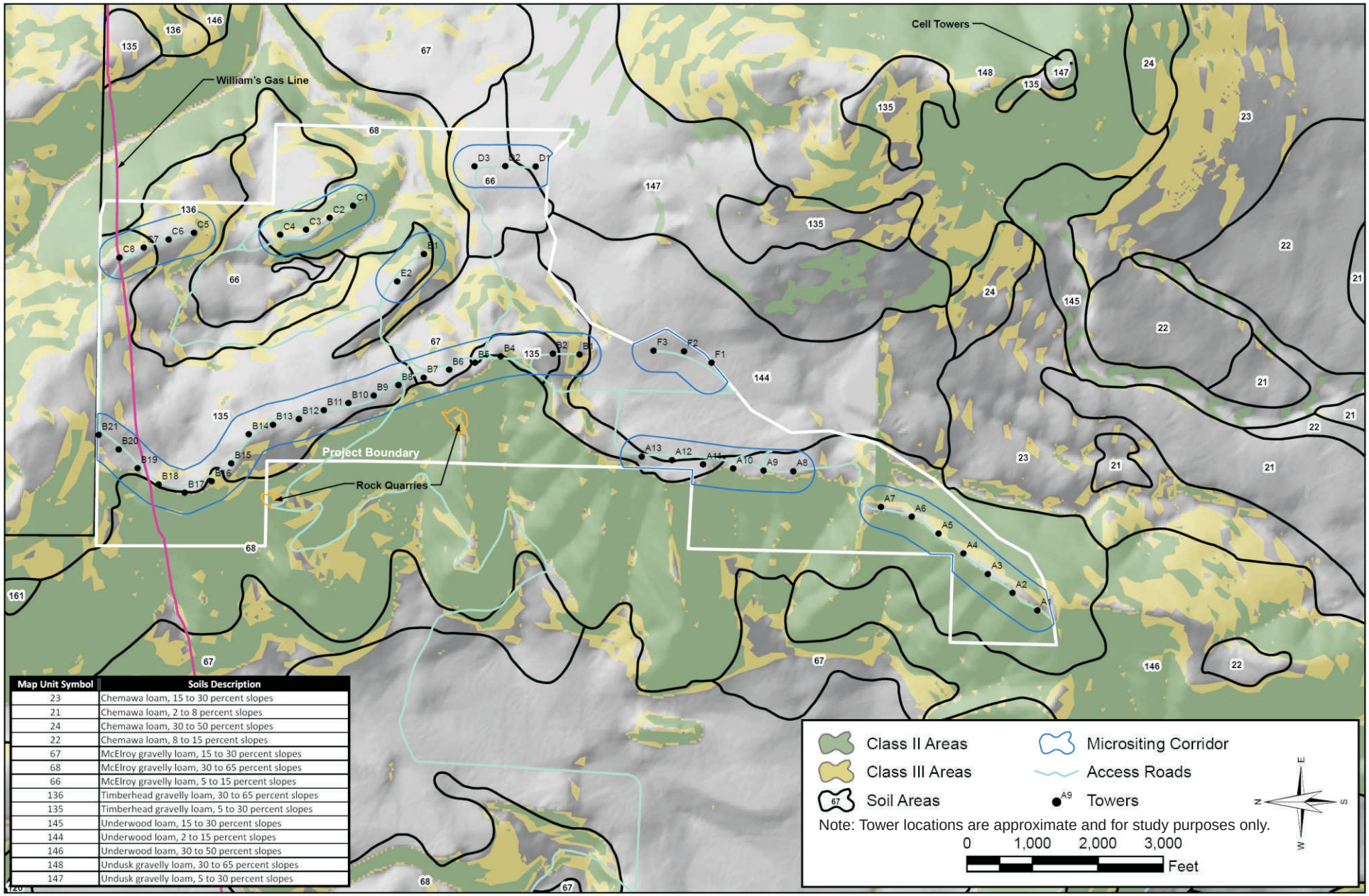

Map Unit Symbol	Soils Description
23	Chemawa loam, 15 to 30 percent slopes
21	Chemawa loam, 2 to 8 percent slopes
24	Chemawa loam, 30 to 50 percent slopes
22	Chemawa loam, 8 to 15 percent slopes
67	McElroy gravelly loam, 15 to 30 percent slopes
68	McElroy gravelly loam, 30 to 65 percent slopes
66	McElroy gravelly loam, 5 to 15 percent slopes
136	Timberhead gravelly loam, 30 to 65 percent slopes
135	Timberhead gravelly loam, 5 to 30 percent slopes
145	Underwood loam, 15 to 30 percent slopes
144	Underwood loam, 2 to 15 percent slopes
146	Underwood loam, 30 to 50 percent slopes
148	Undusk gravelly loam, 30 to 65 percent slopes
147	Undusk gravelly loam, 5 to 30 percent slopes

Source: GeoDataScape.

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Revised Figure 2.15-1

Landslide Hazard Classifications

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URS reviewed available geologic and soils literature to develop a landslide hazard classification for the proposed Whistling Ridge Energy Project. An existing published regional geologic map (partially recreated in Figure 3.1-1 of this report) indicates a large landslide in the northeast corner of the study area underlying Tower Line C. Review of stereo photographs of the area where the landslide deposits are mapped, coupled with a site reconnaissance, indicate that there is little geomorphic evidence for landslide activity such as obvious scarps, hummocky or benched terrain, lobate toe areas, or redirected watercourses. No deep subsurface investigations have been carried out at the site to date, but future explorations in support of design for the turbine tower foundations would provide subsurface information regarding the presence of landslide deposits in the area. Based on our preliminary investigation, there does not appear to be any area of the site that meets Skamania County's criteria for a Class 1 LHA.

Class II LHAs are shown in green on Figure 2.15-1. The Class II LHAs at the site are predominantly associated with the steep slopes to the west of proposed Tower Lines A and B. There are also steep slopes east of the seven southernmost Tower Line A towers, and on both sides of Tower Line C.

2.15.3.2 Impacts

Although none of the proposed turbines are located within Class II LHAs, several of the towers along the western side of the project site (Tower Lines A and B) are located along ridgelines with descending slopes that are locally greater than 35 degrees (70%). The heads of some of the drainages along these slopes are arcuate, indicating possible mass wasting activity such as landslides, debris flows, and / or earthflows.

Based on aerial photo and field observations, the primary mass wasting process below the ridgelines appears to be debris flows and soil creep. No evidence for deep-seated, block failure type landslides was observed. Local surficial creep of near-surface soils is indicated by the presence of pistol-butted trees on some of the slopes, primarily on the descending slope west of the northern portion of Tower Line A. Other slopes have mature conifer stands that indicated little or no soil creep. Further subsurface investigation in support of final tower foundation design would help determine if there are weak rock or soil layers that could contribute to more deep-seated failure of the ridges and provide information on the quality of the rock mass underlying the ridgelines.

It appears that the primary concern for towers located adjacent to the Class II LHAs is the potential for headward erosion of the steep drainages by debris or earth flow processes. Erosion rates of these drainages are unknown, but no obvious recent mass wasting features were observed in the aerial photos or during the site reconnaissance.

Class III LHAs have been delineated adjacent to proposed wind turbines along the southern Tower Line A, and Tower Line C. Class III LHAs are not anticipated to have any impact on the proposed facilities, due to the robust nature of the proposed foundation designs.

The Landslide Hazard Evaluation identified several areas where the proposed wind turbine generators are located adjacent to slopes that meet Skamania County's criteria for Class II and Class III Landslide Hazard Areas. The primary hazard to the proposed towers appears to be the

potential for exposure to headward erosion of steep drainages on the slopes below some of the tower locations. Exposure of the towers to headward erosion of the steep slope drainages can be minimized by providing maximum possible setbacks from the tops of the steep slopes and/or by siting the turbines along portions of the ridgelines that are above intervening spur ridges. The most critical area of exposure to Class II LHAs is the narrow ridge at the southern portion of Tower Line A.

It is URS's opinion that the proposed project can be constructed and operated without danger to human life or the surrounding environment due to landslide hazards.

2.15.3.3 Mitigation Measures

No mitigation measures are required.

2.15.4 VOLCANIC ERUPTION

The Cascade Mountains of the Pacific Northwest region contain sixteen major volcanoes which extend from Mount Garibaldi in British Columbia to Lassen Peak in California (Harris 1988). Four of the volcanoes within Washington and Oregon have experienced activity within historic time: Mount Baker, Mount Rainier, Mount Hood, and Mount St. Helens. Mount Adams is the closest volcano to the project site, situated approximately 30 miles due north, but is not historically active. Mount St. Helens is the closest historically active volcano to the project site, situated approximately 42 miles to the northwest (see Figure 2.15-2).

Effects of volcanic activity may include lava flows, mudflows, pyroclastic flows, and ash-fall. Volcanic flows are typically limited to the flanks of the volcano and major drainage channels extending from the volcano. The USGS has estimated the areas most likely to be affected by future eruptions of Mount St. Helens. The site is not situated in an area identified as having a potential hazard from a pyroclastic flow or lahar (Wolfe and Pierson 1995). Of greatest impact in terms of area affected by an eruption is the tephra, or ash, carried aloft that subsequently falls to the land surface. Modern meteorological records show that both high altitude wind directions and speeds in Washington have been more prevalent and stronger toward east than toward the west in the site region. The USGS (Wolfe and Pierson 1995) estimates that there is between a 0.02% and 0.1% annual probability that there would be 4 inches (10 cm) or more of ash deposited at the site from eruptions throughout the Cascade Range (Figure 2.15-2). Therefore, no mitigation measures are proposed for direct volcanic hazards.

Secondary processes associated with volcanic eruption, such as lahars, flooding and sediment loading can result in more serious damage. The Whistling Ridge Energy Project site is not located within the modern floodplain of rivers within the watershed of Mt. St. Helens or Mount Adams.

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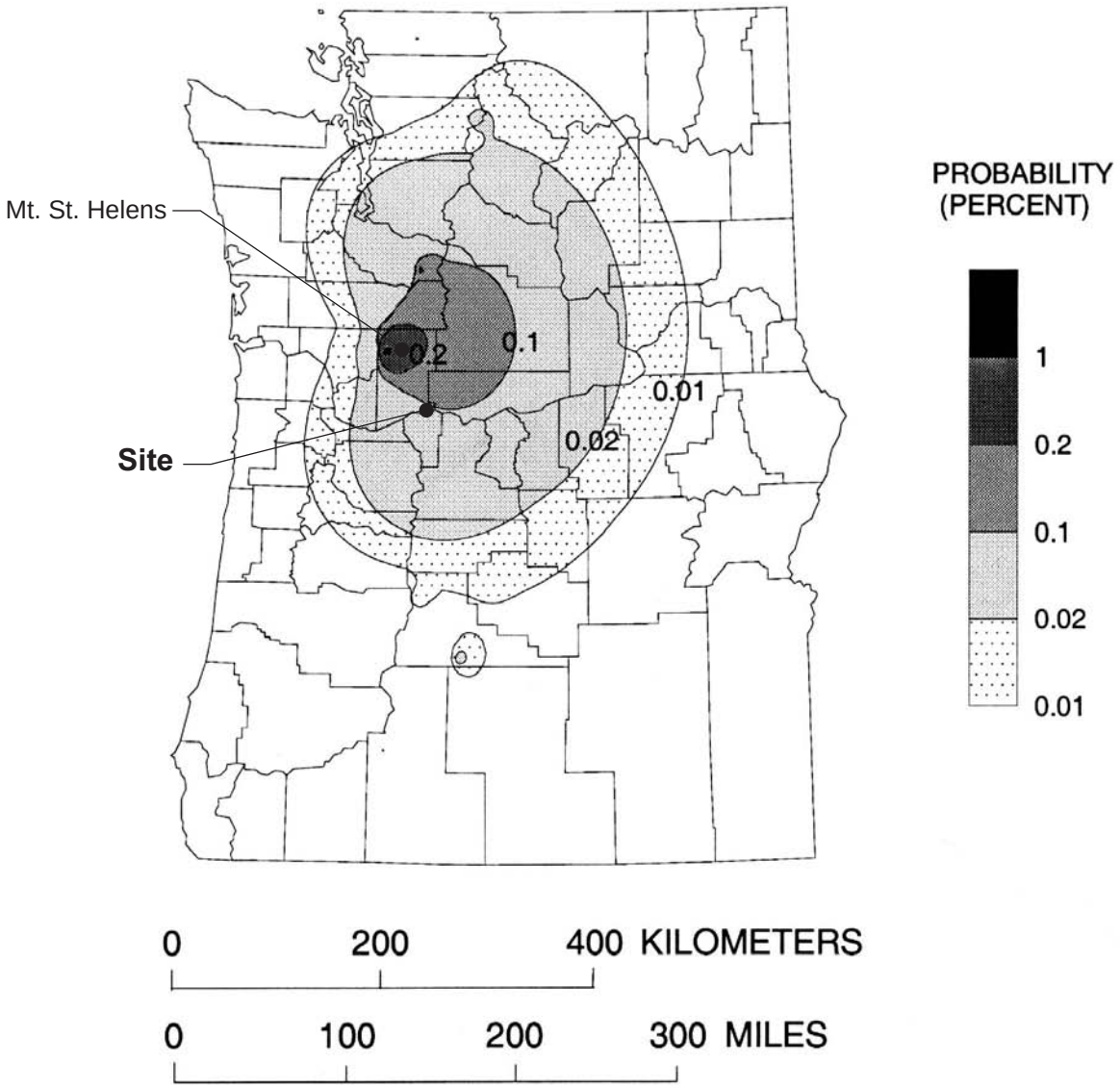

Explanation

Annual probability of accumulation of ten or more centimeters (four or more inches) of tephra in Washington and Oregon from eruptions throughout the Cascade Range. Probability distribution reflects the frequency of explosive eruptions at each major Cascade volcano, the variability in the thickness of tephra that could be deposited at various downwind distances, and the variability in wind direction.

SOURCE: Wolfe and Pierson, 1995

Figure 2.15-2

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Annual Probability of 10 cm of Volcanic Ash

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In the event that a volcanic eruption would damage or impact project facilities, the project facilities would be shut down until safe operating conditions return. If an eruption occurred during construction, a temporary shut-down would most likely be required to protect human health and equipment.

2.15.5 FLOODING

The Whistling Ridge Energy Project site is not located within any 100-year floodplains as currently mapped by the Federal Emergency Management Agency (FEMA). The current elevation of the site is above the 100-year floodplain of the Little White Salmon and Columbia Rivers, and mitigation measures for flooding are not planned.

SECTION 2.16 SECURITY CONCERNS (WAC 463-60-275)

2.16.1 SECURITY PLAN

The Whistling Ridge Energy Project site is located on private land approximately 7 miles northwest of the City of White Salmon in Skamania County, Washington. The project would consist of a substation, an Operations and Maintenance building, and graveled site access roads which lead to the wind turbines. Security is primarily a function of controlled access to the project site and lock-out provisions to major equipment and controls.

A thorough review with WindPro Insurance of Palm Desert, CA, a major insurer of wind power projects around the world, found no recorded cases of terrorism, sabotage, or other similar security threats in the past 15 years of their knowledge for more than 17,000 wind turbines operating in 14 different countries. Vandalism has occurred on some wind power projects, which generally has been limited to petty theft of tools and/or equipment.

A full time security plan would be implemented during project construction. Once construction is completed, a comprehensive operations security plan would be prepared along with a detailed emergency plan.

2.16.1.1 Construction Phase

The Site Project Manager would work with a security contractor to develop a plan to effectively monitor the overall site during construction including drive-around security and specific check points. The security inspection and monitoring plan would be changed throughout the course of construction based on the level of construction activity and amount of sensitive or vulnerable equipment and materials in specific area. Much of the security monitoring activities would be straightforward since all site access ways would be accessible from private logging roads.

Security

All site staff and subcontractors would be required to wear an identity badge and display vehicle clearance tags at all times. Newcomers to the project site would be required to check in, log in, and log out at the main site construction trailers. The main site construction trailers would be equipped with outdoor lighting and motion sensor lighting as required.

Parking for the construction contractor employees would be in an assigned parking area. A barrier or other device would be erected around protected areas to exclude vehicles and pedestrians until protection is no longer required.

Secured Lay-Down Areas

Construction materials would be stored at the individual turbines locations, or at the lay-down area around the perimeter of the Operations and Maintenance facility and site construction trailers. Temporary fencing with a locked gate would be installed for a roughly 1.5-acre area adjacent to the site trailers for the temporary storage of any special equipment or materials. After construction is

completed, the temporary fencing would be removed and the area re-seeded with an appropriate seed mix.

2.16.1.2 Operation Phase

Site visitors including vendor equipment personnel, maintenance contractors, material suppliers and all other third parties would be required to obtain permission for access from authorized Whistling Ridge Energy Project staff prior to entrance. The Plant Operations Manager, or designee, would grant access to any critical areas of the site on an as-needed basis.

Access ways to the main Operations and Maintenance facility area, site trailers, and all wind turbine roads would be constructed with lockable access gates. The access gates would be open during working hours and be secured by project site security personnel after working hours.

Both the Operations and Maintenance facility and the main substation would be equipped with outdoor lighting and motion sensor lighting. The substation would be surrounded by an eight-foot-tall chain-link fence with razor wire along the top. All wind turbines, pad transformers, pad mounted switch panels and other outdoor facilities would have secure, lockable doors.

The plant operations group would prepare a detailed security plan to be implemented to protect the security of the project and project personnel.

2.16.2 EMERGENCY RESPONSE PLAN

Whistling Ridge Energy LLC would establish an emergency response plan for the plant to ensure employee safety from the following emergencies: on-site chemical release, medical emergency, major power loss, fire, extreme weather, earthquake, volcano, and bomb threat. The plan would be established prior to completion of construction. The plan would follow the requirements of WAC 296-24-567 and 296-62-3112 and 29 Code of Federal Regulations (CFR) 1910.38, Emergency Action Plan. All hourly and salaried employees, including administrative staff as well as contractors and visitors, would be covered by the plan. The Emergency Response Plan would be administered by the Plant Manager who would be responsible for overall coordination of the plan. See Section 4.1.6, Emergency Response Plans.

The plan elements would include:

- General evacuation
- Downed power system hazards with specific attention to power lines and the substation
- Personnel injury
- Uptower rescue
- Construction emergencies
- Fire/explosion on-site

- Natural gas release off-site
- Chemical release
- Oil release
- Tornado
- Earthquake
- Emergency freeze protection
- Volcanic eruption (ashfall)
- Injury
- Facility blackout
- Facility bomb threat

SECTION 2.17 STUDY SCHEDULES (WAC 463-60-285)

2.17.1 INTRODUCTION

Surveys of the project site have been completed in full consultation with wildlife agencies. Habitat areas have been fully mapped and included in this Application. Additional surveys are planned for northern goshawks and bats to augment information already obtained, as described in Section 2.17.2. Subsequent to the March 2009 submittal of the Application for Site Certification, a~~A~~dditional surveys ~~are planned~~were performed for the roadway corridor~~ within the Columbia River Gorge National Scenic Area in the spring of 2009~~, and existing surveys ~~will be~~were confirmed. All will be included in the information prepared for the environmental impact statement.

2.17.2 ADDITIONAL STUDIES

Additional northern goshawk and anabat surveys will be made in the project area:

- The northern goshawk is not listed as "threatened" or "endangered" by either the state of Washington or federal agencies. The applicant completed northern goshawk surveys in accordance with protocols accepted and recommended by the Washington Department of Fish & Wildlife (WDFW). The surveys were conducted during the relevant seasons in 2004, 2005, 2008 and again in ~~2008~~spring and summer, 2009, in accordance with agreed upon protocols. No goshawks were found on the project site, nor were any observed on any surrounding properties. It is highly unlikely that goshawks will be found on the project site or in areas to the north, owned and managed by Washington State Department of Natural Resources (WDNR). ~~The applicant will conduct an additional survey on the project site in spring 2009 to confirm these findings, in accordance with agreed protocols.~~ The WDNR property near the project site has similar habitat characteristics to the project site, and was recently logged. ~~While no goshawks are expected on the area to the north, due to the proximity of turbines to the WDNR property to the north, the Applicant will conduct an intensive survey effort on approximately 360 acres to the north of the project site to confirm that the project does not present any significant impact to this species.~~

- Anabat detection surveys ~~proposed~~ for 2009 were started in July and will ~~be implemented during the months of July~~continue through October, and will augment our understanding of bat activity within the vicinity of the proposed micrositing corridors. Anabat detectors also will be elevated to gain a better understanding of bat activity at rotor swept height.

The access roadway has been revised to use West Pit Road, ~~that would traverse the Scenic Area is~~ an existing road in a developed area managed for commercial forestry that connects the project area to the Cook-Underwood Road (via Willard Road), entirely outside of the Columbia River Gorge National Scenic Area. The roadway would be widened to provide access for construction vehicles. ~~The following s~~Plant and wildlife surveys ~~are planned for~~were performed in June~~ spring~~ 2009 and the results have been incorporated into this amended application~~:~~.

- ~~Scenic Area Wetland and Habitat Survey~~
- ~~Scenic Area Sensitive Plant Field Survey~~
- ~~Scenic Area Wildlife Survey~~
- ~~Scenic Area Cultural Resource Reconnaissance Survey~~

SECTION 2.18 POTENTIAL FOR FUTURE ACTIVITIES AT THE SITE (WAC 463-60-295)

2.18.1 EXPANSION OF WHISTLING RIDGE ENERGY PROJECT

Depending on market conditions and the ability to lease land from the WDNR, there is a potential that the Whistling Ridge Energy Project could be expanded in the future. The potential expansion area would be directly north of the existing project site and consist of the lease of up to four sections[1] from WDNR for the placement of approximately 50 additional wind turbines. The potential expansion would be located in Klickitat County in an area studied during that County's Energy Overlay Zone process. See Figure 2.18-1, Potential Expansion Area.

At this time, such expansion is speculative, and sufficient environmental and engineering information and analyses are not available to pursue permitting. If the project is ultimately expanded to include the WDNR property, revenues generated from these lands would benefit the State School Trust, including local public schools.

The expanded site and the existing and planned facilities (both the transmission and the Operations and Maintenance facilities) would support an expansion in the future, should the expected demand for clean renewable energy continue to grow.

[1] A "section" is one square mile, consisting of 640 acres.

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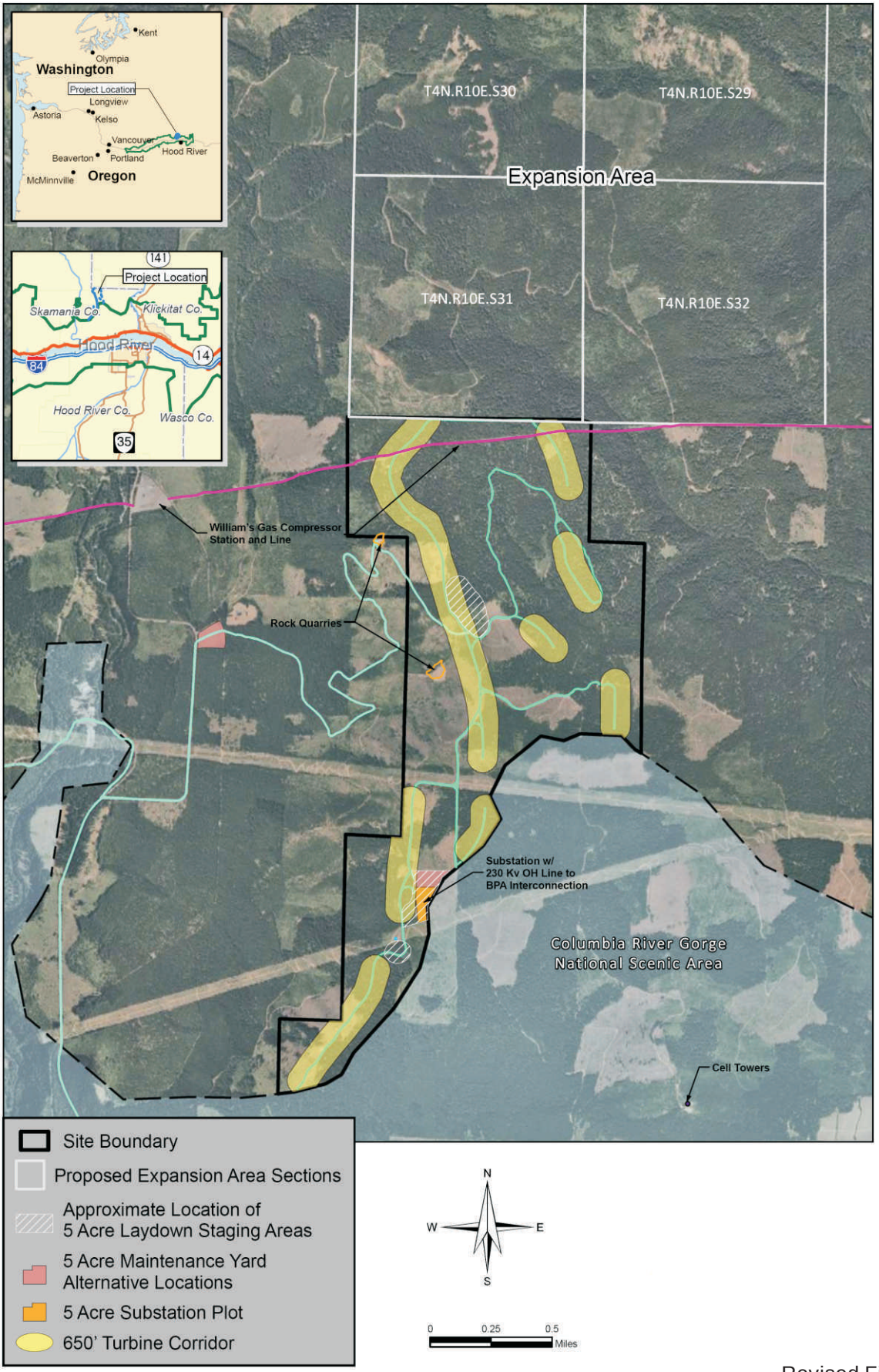

Source: GeoDataScape.

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Revised Figure 2.18-1

Potential Expansion Area

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SECTION 2.19 ANALYSIS OF ALTERNATIVES (WAC-463-60-645)

2.19.1 INTRODUCTION

This section summarizes the alternatives that were explored during the development of the Whistling Ridge Energy Project.

2.19.2 SITE SELECTION

The Whistling Ridge Energy Project would be a wind-powered energy facility constructed by Whistling Ridge Energy LLC. Whistling Ridge Energy LLC is a special-purpose corporation formed to develop, permit, finance, construct, own and operate the Whistling Ridge Energy Project. Whistling Ridge Energy LLC is a Washington corporation formed under Title 23B of the RCW. It is wholly-owned by S.D.S Co., LLC and proposed to be constructed on land owned by S.D.S. Co., LLC and Broughton Lumber Company. The project site, north of the Columbia River Gorge, is optimally suited for wind energy, and is crossed by two BPA high voltage transmission lines. The project site already has a network of logging roads, requiring the construction of relatively few new roads. Approximately ~~7.2~~7.9 miles of existing private logging roads would be improved. In areas where there are no existing logging roads near proposed wind turbine strings, approximately 2.4 miles of new gravel access roads would be constructed. Some of these construction roads would continue to be used during the project's operational phase.

As described in the Introduction, the objective of the Whistling Ridge Energy Project is to construct and operate a wind energy generation resource to meet a portion of the projected growing regional demand for new energy resources. The Energy Information Administration projects total electricity demand growth between 1.8% and 1.9% per year from 2001 through 2025. The Western Electricity Coordinating Council forecasts that, due to cooler than normal temperatures, peak demand requirement will increase at a compound rate of 2.4% per year (WECC 2005). Based on data published by the Northwest Power and Conservation Council, electricity demand for the Council's four-state Pacific Northwest planning region (Washington, Oregon, Idaho, and Montana) was 20,080 average MW in 2000 and is estimated to grow to 22,105 average MW by 2015, based on medium demand (NWPCC 2005). The Northwest Power and Conservation Council's Sixth Electric Power and Conservation Plan is expected to be published in draft in August 2009.

Washington and the Northwest region face a growing medium and long-term demand for power. Many regional utilities are seeking to acquire new generating resources to meet their loads. More specifically, several regional utilities, including Avista, Puget Sound Energy, and PacifiCorp (doing business as Pacific Power in Washington) have all completed detailed studies and demand forecasts of their own systems as part of their Integrated Resource Plan or Least Cost Plan process with oversight from the Washington Utilities and Transportation Commission. As a result of their formal Integrated Resource Plan or Least Cost Plan processes, these three utilities have issued Requests for Proposals specifically for wind power and/or other renewable

resources. Finally, Washington now requires that utilities meet the state's Renewable Portfolio Standards requirements, which will likely be confirmed nationally.

The proposed project is intended to help meet this growing regional demand for renewable, wind-generated electricity.

The project is not considered a reasonable alternative to any other wind energy facility or wind energy facility site. No project, on its own, can meet the forecasted or immediately requested demand for power in the region.

EFSEC has previously supported the application of certain criteria for the evaluation of wind energy project sites. While Whistling Ridge Energy LLC is not a developer of multiple sites, and only proposes the site described in this application, the selection of this site conforms to accepted site selection criteria:

- Commercially viable wind resource
- Access to high voltage (115kV or 230 kV) transmission lines within a reasonable distance to a project site, with sufficient available capacity to carry the project's output
- Absence of significant environmental constraints (i.e., no threatened or endangered species, major archeological resources, critical wetlands, etc.)
- Willing landowner(s) with sufficient undivided acreage to support a project
- Accessible site with sufficient road access to permit delivery of large wind turbine components and allow construction of project infrastructure
- Appropriate and compatible zoning designation and/or lack of conflicting land uses

The Whistling Ridge Energy Project site appears to meet all of the above criteria. Other potential sites are not owned and controlled by the Applicant, and they are not deemed to be viable alternatives to the proposed project. Because the site is optimally suited for the production of wind energy, has been used for forestry, has existing roads suitable for wind turbine placement and maintenance, is adjacent to BPA transmission lines, and is owned by the Applicant, no additional sites were considered.

2.19.3 ELECTRICAL TRANSMISSION ROUTING ALTERNATIVES

The project site is crossed by two BPA high voltage transmission lines. A substation with a 230 kW overhead line is proposed to be located immediately adjacent to the BPA right-of-way. The proposed location of the substation was selected to be placed in a relatively clear and low level area adjacent to the planned Operations and Maintenance facility. The elevation was selected to minimize impacts from winter snow. To minimize the need for creating new transmission corridors, no alternative transmission routing corridors were considered.

2.19.4 ALTERNATIVE TECHNOLOGIES AND FUEL

Whistling Ridge Energy LLC has proposed the project to provide an alternative source of energy that does not generate air or water emissions and does not produce hazardous waste. Wind energy is considered a renewable resource, and its operation does not deplete natural resources such as coal, oil, or gas; cause environmental damage through resource extraction and transportation; or require significant amounts of water during operation. Because of the environmental benefits of wind energy, and the suitability of the site already owned by the Applicant for wind energy, no alternative technologies or fuel sources were considered.

2.19.5 ALTERNATIVE CONSTRUCTION ACCESS

There are ~~only two~~three potential ways to access the project site. ~~Both~~ All are via County roads from SR 14 to Cook-Underwood Road. From Cook-Underwood Road the project site can ~~either~~ be accessed by:

- ***Route 1:*** Ausplund Road to a private logging road vacated by Skamania County in 1987, which crosses private property (not owned by the Applicant) that is currently used for residential, agricultural orchards, and commercial timber production and harvest.

- ***Route 2:*** Kollock-Knapp Road to Scoggins Road to a private logging road called the CG2930 road on County Assessor's maps, which crosses property owned by the Applicant that is currently used for commercial timber production and harvest. ~~(See Figures 4.3-1 and 4.3-2 in Section 4.3 Transportation for the location of CG2930.)~~

- ***Route 3:*** Cook-Underwood Road to Willard Road to a new connection to West Pit Road. West Pit Road is a private logging road that is currently used for commercial timber production and harvest. (See Figures 4.3-1 and 4.3-2 in Section 4.3 Transportation for the location of West Pit Road.)

The private logging road in Route 1 was made a County right of way in 1923. It was vacated for public use in 1987 by resolution of the Skamania Board of County Commissioners; however, the rights to use the road by abutting property owners remain. Additionally, road improvements to this route would be required for access to construct the wind energy facility and for ongoing Operations and Maintenance traffic. Impacts to a non-project landowner from these activities would occur if Route 1 were used.

Route 2~~, on the other hand,~~ would require~~s~~ minor roadway improvements that would not directly impact any non-project landowners. However, these roadway improvements would require construction within the Columbia River Gorge National Scenic Area (CRGNSA). Therefore, Route 2 ~~is the preferred, and perhaps the only practicable,~~has been eliminated as a construction roadway access alternative.

Route 3 would require a new direct connection from Willard Road to West Pit Road, and improvements to the West Pit Road. The roadway is located entirely on private property outside of the CRGNSA. Route 3 is the preferred, and perhaps only practicable, access alternative.

2.19.6 ALTERNATIVE HAUL ROUTES AND METHODS OF TRANSPORT

All wind energy components, including tower sections, the nacelle and turbines, and blades would be shipped to either the Port of Longview or Port of Vancouver and then be transported by any or all of the following three modes of travel:

- Specialized trucks along State, County, City, and private roadways
- Burlington Northern Santa Fe (BNSF) rail lines running parallel to SR 14
- Barge and tug boat up the Columbia River and through the lockage facility at the Bonneville Dam to the SDS Lumber Company industrial dock in Bingen

Wind energy components transported on specialized trucks from either of the Ports would be delivered directly to the proposed project site. Components transported either by rail or barge from either of the Ports could be delivered to the SDS Lumber Company industrial facility in Bingen, loaded onto specialized trucks, and then transported to the proposed project site. Fuel would be delivered to the proposed site by truck as needed.

Trucks transporting wind energy components could have loads as high as 17.5 feet measured from the ground to the highest point of the load, as wide as 14.5 feet or as long as 150 feet. Specialized trucks may be used to transport wind energy components from either the Port of Longview or the Port of Vancouver to the west junction of Cook-Underwood Road with SR 14 at MP 56.28. East of that intersection ~~Trucks~~ trucks traveling along SR 14 ~~between Vancouver, Washington and Cook-Underwood Road~~ would be physically constrained by a series of three very narrow tunnels with height restrictions as low as 13 feet 9 inches measured vertically from the edge of the roadway. Over-size loads that would include transport of the tower sections, the nacelles and turbines, and blades would encounter restrictions and/or prohibitions along SR 14 between Vancouver, Washington and the junction of SR 14 and Cook-Underwood Road at MP ~~63.32~~56.28 due to the length and/or width of the loads. Cook-Underwood Road near its northern most point at approximate MP 5.5 contains a bridge that crosses the Little White Salmon River. Crossing this bridge with specialized trucks transporting wind energy components would require special provisions agreed upon between S.D.S Co., LLC and Skamania County.

An alternate route for transport of wind energy components from either of the Ports to the east junction of SR 14 and Cook-Underwood Road at MP 63.32 would include trucks traveling on Interstate 84 (I-84) through Oregon to the Boardman junction, then along SR 730 to the junction of I-82 with SR 395, across the Columbia River back into Washington State, and then to SR 14. Trucks traveling on SR 14 between the junction of I-82/SR 395 and Cook-Underwood Road would be physically constrained by one very narrow tunnel with a height restriction of 13 feet 3 inches measured vertically from the edge of the roadway.

The option of using rail to transport the wind energy components from either of the Ports to the SDS Lumber Company facility also was analyzed. Wind energy components on rail cars can be up to 14.5 feet in width, up to approximately 15 feet in height, and as long as 150 feet. The BNSF rail line between Vancouver, Washington and the SDS Lumber Company facility in Bingen, Washington may not be able to accommodate loads with widths in excess of 14 feet.

This may preclude transport of the bottom tower sections using rail. The wind energy nacelles, turbines, and blades could be transported along the BNSF line to the SDS Lumber Company facility. BNSF could transport the wind energy components on standard or heavy-duty 89-foot long flat rail cars. The wind energy components would be off-loaded at the SDS Lumber Company industrial facility to a staging location to be determined and loaded onto specialized trucks for transport to the proposed project site. Transport of wind energy components using specialized trucks from the SDS Lumber Company industrial facility to SR 14 would require the use of Maple Street in the City of Bingen, Washington for approximately 0.25 mile.

The third option analyzed for transporting the wind energy components from either of the Ports to the SDS Lumber Company industrial facility was by using barges. The wind energy components would be off-loaded from a ship at either of the Ports, loaded onto barges, and then transported upriver to the Bonneville Dam using tug boats. The barges and tugs would by-pass the Bonneville Dam via the lockage facility, and continue upriver to the SDS Lumber Company industrial facility. There would be no over-size or over-weight restrictions using barges as a transport mode for wind energy components at either of the Ports, on the Columbia River, or at the lockage facility at the Bonneville Dam. Coordination with the Bonneville Dam Project Office would be required to determine optimal times for lockage use. The Bonneville lockage facility accommodates commercial, government, and recreational vessels. The heaviest lockage traffic on average occurs during the month of August. Vessel traffic is typically heaviest on Thursdays, Fridays, Saturdays, and Sundays. The wind energy components would be off-loaded at the SDS Lumber Company industrial facility to a staging location to be determined and loaded onto specialized trucks for transport to the proposed project site. Transport of wind energy components using specialized trucks from the SDS Lumber Company industrial facility to SR 14 would require the use of Maple Street in the City of Bingen, Washington for approximately 0.25 mile. There are currently no over-size or over-weight restrictions for this roadway. Like the use of rail, this option would still require using specialized trucks to transport the wind energy blades from the SDS Lumber Company industrial facility to the junction of SR 14 and Cook-Underwood Road at milepost (MP) 63.32, and this section of SR 14 has a length restriction of 125 feet.

In Section 4.3 Transportation, there is a detailed description of the limitations on area roadways in terms of the width, height, length and weight of the loads to be transported, and the needed roadway improvements.

2.19.7 ALTERNATIVE SITE FOR OPERATIONS AND MAINTENANCE FACILITY

Two sites are being considered for the operations and maintenance facility, either adjacent to the substation on site or along West Pit Road to the west of the project site. Both sites would be approximately 5 acres in size and include an approximately 3,000 square foot enclosed space, including office and workshop areas, a kitchen, bathroom, shower and utility sink. The building would be constructed of sheet metal, and would be approximately 16 feet tall (to the rook peak). The site along West Pit Road provides the advantage of being at a lower elevation than the site adjacent to the substation which would make it more accessible during winter months. The West Pit site is located on land zoned Residential 5, whereas the alternative site is Unmapped (UNM).

The maintenance and operations use would be allowed by conditional use approval in the Residential 5 zone and is allowed outright in the UNM area.

~~2.19.7~~2.19.8 NO ACTION ALTERNATIVE

Under the No Action Alternative, the proposed Whistling Ridge Energy Project would not be constructed or operated, and the environmental impacts described in this Application would not occur. The No Action Alternative assumes that future development would comply with existing zoning requirements for the project area, which include Unmapped, Forest/Agriculture 20 and Residential ~~10~~5. The project area is designated in the County's Comprehensive Plan as "Conservancy." According to the County's Comprehensive Plan, the Conservancy land use is intended to provide for the conservation and management of existing natural resources in order to achieve a sustained yield of these resources, and to conserve wildlife resources and habitats (Skamania County 2007). Logging, timber management, agricultural and mineral extraction are the main activities that take place in this area. Among the uses identified in the 2007 Comprehensive Plan as appropriate in the Conservancy designation are: public facilities, utilities, utility substations, forest management (including temporary logging and mining camps) and surface mining (by conditional use). Wind energy is considered to be a utility and could be proposed by another applicant.

If the proposed project is not constructed, Washington electrical utilities would lose an important non-polluting renewable resource alternative close to the region's major metropolitan areas. The economic benefits associated with this capital investment and the economic activity associated with construction and operation of the facility would be foregone.

It is likely that the region's need for power would be addressed by some combination of user-end energy efficiency and conservation measures, by existing power generation sources, or by the development of new renewable and non-renewable generation sources. Base load demand would likely be filled through the expansion of existing thermal generation or development of new thermal generation, such as gas-fired combustion turbine technology. Such development could occur at appropriate locations throughout the state of Washington.

A base load natural gas-fired combustion turbine would have to generate approximately 41 average MW of energy to replace an equivalent amount of power generated by the project (75 MW at 33% net capacity). An average MW (aMW) is the average amount of energy supplied over a specified period of time, in contrast to MW, which is the maximum or peak output or capacity that can be supplied for a short period.

SECTION 2.20 PERTINENT FEDERAL, STATE AND LOCAL REQUIREMENTS (WAC 463-60-297)

2.20.1 APPLICABLE FEDERAL, STATE AND LOCAL PERMIT REQUIREMENTS

Table 2.20-1 lists all applicable federal, state, and local permits and related requirements that would apply to construction of the Whistling Ridge Energy Project if Whistling Ridge Energy LLC had not elected to request approval under EFSEC jurisdiction. The table lists the permits or requirements, identifies the permitting agency, and cites the authorizing statute or regulation. The table also identifies the section(s) in the application relating to each permit or requirement.

Table 2.20-1
Applicable Federal, State and Local Requirements

Permit or Requirement	Agency/Statute & Regulation	Application §§
Federal		
National Environmental Policy Act (NEPA)	BPA; it is anticipated that there will be a NEPA/SEPA process.	
BPA Interconnection Agreement	BPA	
Threatened or Endangered Species Assessment; Migratory Bird Treaty Act	NEPA lead agency (BPA, USACE and EPA) Endangered Species Act, §7; 16 U.S.C. § 1531 et seq.; 50 CFR Pt 402 Migratory Bird Treaty Act, US Fish & Wildlife Service	§ 3.4.2
Historic Preservation/Landmark Review	National Historic Preservation Act, § 106; 16 U.S.C. § 470 et seq.; 36 CFR §§ 60-63, 800; Historic Sites, Buildings, Objects, and Antiquities, 16 U.S.C. § 469 et seq.; 36 CFR §§ 296.1; 43 CFR §§ 7.1 et seq.	§ 4.1
No Hazard Determination	Federal Aviation Authority	§ 4.2.2
State of Washington		
State Environmental Policy Act (SEPA)	Skamania County would have been lead agency absent EFSEC jurisdiction. Washington Environmental Policy Act, Chapter 43.21C RCW; Chapter 197-11 WAC Washington Department of Ecology SEPA Rules, which establishes uniform requirements for compliance with SEPA.	Parts 3,4,and 5
Temporary air permit for the concrete batch plant Temporary air permit for the rock crushing for roadways	South West Clean Air Agency RCW 70.94; Ch. 173-401 WAC	§§ 3.2 and 5.1
Forest Practices Application	Washington State Department of Natural Resources Ch. 76.09 & 76.13 RCW; Ch 222 WAC	§ 4.2.1

Table 2.20-1 (continued)
Applicable Federal, State and Local Requirements

Permit or Requirement	Agency/Statute & Regulation	Application §§
Construction Stormwater General Permit	Ecology, Water Quality Program Federal Clean Water Act, 40 CFR Parts 122, 123 & 124, Subchapter D; Chs. 80.50 & 90.48 RCW; Chs. 173-216 & 220 WAC	§ 2.10; 5.2
Approval for Over Height and Over Length Loads on State Highways	WSDOT Goldendale Office 509-427-3920	§ 4.3
Possible WSDOT right of way approval	WSDOT Goldendale Office 509-427-3920	§ 4.3
Approval of Industrial Water Well (Notice of Intent to Construct a Water Well; Water Well Report)	Ecology, Water Quality Program Ch. 18.104, 70-119A & 90.44 RCW; Ch 173-160 and 246-291 WAC Federal Safe Drinking Water Act, 42 USC § 300(f) Parts B & C	§ 2.5; 3.3
Archaeology and Historic Preservation	Washington State Office of Archaeology and Historic Preservation Archaeological Sites and Resources, Chapter 27.53 RCW.	
Electrical Construction Permit	Department of Labor & Industries Ch. 296-746 WAC	
Skamania County		
Building Permit (Civil, Structural, Mechanical, Plumbing)	Skamania County Building Official Title 15 SCC (adopting the IBC, UPC, UFC, and UMC)	§ 4.2.1
Zoning (Conditional Use Permit; Consistency with Skamania County 2007 Comprehensive Land Use Plan)	Skamania Community Development Title 21 SCC Ch. 36.70; Ch 36.70A RCW	§ 4.2.1
Compliance with Noise Regulations	Skamania County Sheriff Department Ch. 8.22 SCC Ch. 70.107 RCW; Ch. 173-60 WAC;	§ 4.1.1
Critical Areas Variance and Development Review	Skamania Community Development Ch. 21A SCC Ch. 36.70; 36.70A RCW	§ 3.1
Clearing and Grading Permit	Skamania Community Development Ch 36.70; 36.70A RCW	§ 3.1
Water Availability Verification Evaluation (WAVE); Group B Water System Approval	Skamania Community Development Ch 50.56 and 70.119A; Ch 246-291 WAC; Chapter 15 and 8.68 SCC Federal Safe Drinking Water Act, 42 USC § 300(f) Parts B & C	§ 3.3
On-Site Septic System Site Evaluation and Design Review	Skamania Community Development Ch. 70.118 RCW; Ch. 246-272A WAC	§ 2.7

Table 2.20-1 (continued)
Applicable Federal, State and Local Requirements

Permit or Requirement	Agency/Statute & Regulation	Application §§
Road Approach Permit, Haul Route Agreement and Negotiated Private Road Requirements	Skamania County Department of Public Works Ch. 12.03 SCC; Skamania County Road Approach and Private Roads Standards Development Assistance Manual	§ 4.3
~~Columbia Gorge National Scenic Area Approval~~	~~Skamania Community Development~~ ~~Ch. 22.14 SCC~~ ~~Federal National Scenic Area Act; 16 USC § 544-544p~~	~~§ 4.2.3~~

2.20.2 FEDERAL PERMITS

2.20.2.1 National Environmental Policy Act (NEPA)

Due to the interconnect with the BPA system, and the need for a Large Generator Interconnection Agreement, the project must undergo National Environmental Policy Act (NEPA) review. ~~The Applicant anticipates that~~ BPA and EFSEC ~~will undergo~~are jointly preparing a ~~joint~~ NEPA/SEPA ~~process~~Environmental Impact Statement.

Interconnection Agreement

The Applicant filed for an interconnection on in June 2002 and it is presently under study.

2.20.2.2 Threatened or Endangered Species Assessments

National Environmental Policy Act (federal) lead agency
Endangered Species Act, § 7; 16 U.S.C. § 1531 et seq.; 50 CFR Pt 402

The Endangered Species Act (ESA) provides for the conservation of endangered and threatened species and the ecosystems upon which they depend. The ESA establishes, for federal agency actions, a "procedural obligation to consult" with the US Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS).

The consultation process generally involves three steps. First, a federal agency proposing to take action inquires with USFWS and NMFS as to whether a protected species may be present in the area affected by the project. Second, if there is reason to believe the federal action will likely affect a protected species the agency must consult with USFWS and NMFS and avoid jeopardizing the species. The agency prepares a Biological Assessment to determine whether the species (if present) or its habitat would likely be affected by the action. USFWS and NMFS will review the Biological Assessment for completeness and determine whether the federal action will jeopardize the species or not, and will suggest alternatives to reduce or eliminate impacts of the action on the species.

With regard to potential mortalities to avian species, under the Migratory Bird Treaty Act, the USFWS has jurisdiction over the taking of migratory birds. The applicability of the Migratory Bird Treaty Act to wind energy facilities has been debated. However, enforcement under the Migratory Bird Treaty Act has not been initiated for projects like this one that have undergone extensive pre-

application avian survey work, have conferred with wildlife agencies, and can show that potential impacts are insignificant through sound protocols and efforts to minimize and mitigate impacts, including through compliance with voluntary wind energy siting guidelines.

Compliance Plan

The Applicant has completed extensive pre-application habitat and wildlife surveys, conducted pursuant to best industry standards, in consultation with wildlife agencies. A Biological Assessment will be prepared and consultation initiated with the USFWS concurrent with the preparation of the NEPA/SEPA EIS. Compliance is further documented in Section 3.4 Habitat, Vegetation, Fish and Wildlife.

2.20.2.3 Historic Preservation/Landmark Review

National Environmental Policy Act (federal) lead agency (OFE)
National Historic Preservation Act § 106; 16 U.S.C. § 470 et seq.; 36 CFR §§ 60-63, 800; Historic Sites, Buildings, Objects, and Antiques, 16 U.S.C. § 469 et seq.; 36 CFR § 296.1; 43 CFR § 7.1 et seq.

The National Historic Preservation Act authorizes the Secretary of the Interior to expand and maintain a National Register of districts, sites, buildings, structures, and objects significant in American history, architecture, archeology, engineering and culture. Federal agencies having authority to license any undertaking must, prior to approval of funds or issuance of any license, take into account the effect of the undertaking on any district, site, building, structure or object that is included in, or eligible for, inclusion in the National Register.

The purpose of the Natural Landmarks program is to identify and encourage the preservation of nationally significant examples of the full range of ecological and geological features that constitute the nation's natural heritage. Federal agencies are responsible for considering the existence and location of natural landmarks when assessing the effects of their actions on the environment pursuant to NEPA.

Compliance Plan

A survey for potential historic sites has been prepared and a new survey will be performed and included in the EIS. No evidence of prehistoric activity was observed during the cultural resource survey. No archaeological sites or historic properties were identified, although two historic archaeological isolates were found and documented (Section 4.2.5, Historic and Cultural Preservation). Federal and state regulations require consideration of project effects on historic and/or cultural resources. Cultural resources must undergo a Section 106 Review Process for projects with a federal nexus under the National Historic Preservation Act. Section 106 review will be included in an EIS as a part of the NEPA compliance documentation

2.20.2.4 No Hazard Determination

Pursuant to Title 14 of the CFR, Part 77 Objects Affecting Navigable Airspace, notice shall be made to the FAA of any construction of more than 200 feet above the ground level at its site. The wind

turbines, estimated at approximately 426 feet in height (262-foot hub height and 164-foot radius blades, measured from the ground to the turbine blade tip), would exceed the 200-foot measure. If a structure exceeds obstruction standards but does not result in a substantial adverse effect, a determination of no hazard would be required to be obtained from FAA prior to construction.

Compliance Plan

Whistling Ridge Energy LLC will send one executed form set (four copies) of FAA Form 7460-1, Notice of Proposed Construction or Alteration, to the Manager, Air Traffic Division, FAA Regional Office having jurisdiction over the area within which the construction or alteration will be located. The notice required under Sec. 77.13(a) (1) through (4) will be submitted at least 30 days before the earlier of the following dates: (1) the date the proposed construction or alteration is to begin; or (2) the date an application for a construction permit is to be filed.

All no hazard determinations shall address or include:

1. ***Full Description.*** A full description of the structure, project, etc., including all submitted frequencies and effective radiated power shall be included. Use exact information to clearly identify the nature of the project (e.g., microwave antenna tower; FM, AM, or TV antenna tower; suspension bridge; four-stack power plant; etc.).

2. ***Latitude, Longitude, and Height.*** Specify the latitude, longitude, and height(s) of each structure. When an obstruction evaluation study concerns an array of antennas or other multiple-type structures, specific information on each structure should be included.

3. ***Marking and/or Lighting.*** A marking and/or lighting recommendation shall be a condition of the determination when aeronautical study discloses that the marking and/or lighting are necessary for aviation safety.

2.20.3 STATE PERMITS

2.20.3.1 State Environmental Policy Act

EFSEC
Ch. 463.47 WAC

Compliance with SEPA is required before any state or local permits or approvals can be issued for the construction or operation of the facility. Skamania County would be the SEPA lead agency for local compliance absent EFSEC review at the State level. EFSEC is lead agency according to Chapter 463-47 WAC. The SEPA process is generally the same, regardless of lead agency.

Compliance Plan

On April 6, 2009 EFSEC ~~will make~~ issued a Determination of Significance, a threshold determination requiring the preparation of a SEPA EIS~~, likely a Determination of Significance~~. This

will be followed by the preparation and issuance of a Draft EIS. The Final EIS will be published following the close of adjudicatory hearings.

~~It is anticipated that~~ EFSEC ~~will~~ has joined with BPA in the preparation of a joint NEPA-SEPA EIS that will suffice for both Federal and State permitting decisions. It is further anticipated that EFSEC and BPA will coordinate this effort with Skamania County to ensure that the County has ample opportunity to participate in the process, potentially as a cooperating agency.

2.20.3.2 Temporary Air Permit (for Concrete Batch Plant and for Rock Crushing)

Southwest Clean Air Agency (SWCAA)
Ch. 70.94 RCW; Chs. 173-400; 173-460 WAC

Ecology has regulations governing the operation of portable rock crushers and concrete batch plants. Both may be utilized during the construction of roadways and wind turbine foundations.

Compliance Plan

A temporary air permit would have been required for rock crushing for roadbeds and for one or more portable concrete batch plants (for mixing material for foundations) absent EFSEC jurisdiction. Whistling Ridge Energy LLC will comply with all substantive requirements of such permits. It is anticipated based on past practice that EFSEC would coordinate with the Southwest Clean Air Agency and Ecology as appropriate to ensure compliance with local, state and federal air pollution standards and regulations for the construction phase.

2.20.3.3 Forest Practices Application

Washington State Department of Natural Resources (WDNR)
Ch. 76.09 and 76.13 RCW; Ch 222 WACA

Forest Practices Application/Notification (FPA/N) would be required for activities on forest lands including timber harvest, construction of forest roads, installation or replacement of culverts or bridges on forest roads, and constructing or expanding gravel pits on forest land for forestry use absent EFSEC jurisdiction. Chapter 222-20-050 WAC and RCW 76.09.060(3) regulates portions of forest lands that are permanently removed from forestry use within three years of harvest, the forest practice as a Class IV General conversion. Reforestation of permanently converted areas is not required. The harvest must comply with applicable water typing, riparian management zone, and channel migration zone standards limiting the amount and location of timber removed in or near streams. A WDNR-approved Road Maintenance and Abandonment Plan would be required to inventory all existing and constructed forest roads, and to schedule any needed road work. All boundaries would be marked in the field prior to submittal of the FPA/N to WDNR.

Compliance Plan

The Whistling Ridge Energy LLC will comply with the substantive requirement and it is anticipated that EFSEC will coordinate with WDNR.

EFSEC will issue a SEPA ~~determination~~ EIS specifying areas to be temporarily and permanently converted to non-forestry use because of the wind energy facility, and areas that are to remain in commercial forest production.

2.20.3.4 Construction Stormwater General Permit

Washington Department of Ecology
Federal Clean Water Act; 40 CFR Parts 122, 123 & 124, Subchapter D; Chs. 80.50 & 90.48 RCW; Chs. 173-216 & 220 WAC

Coverage under the 2005 Construction Stormwater General Permit will be required for stormwater discharges resulting from construction of the Whistling Ridge Energy Project. Construction activities that disturb more than five acres of land and certain industrial activities typically must file a notice of intent with Ecology and comply with the conditions of the general permits. Permit conditions include the preparation of SWPPPs to implement BMPs to prevent or control stormwater pollution, monitoring of discharges during construction, and regular reporting to Ecology.

Compliance Plan

EFSEC has jurisdiction regarding the NPDES Permit over the project, pursuant to WAC Chapter 463-38. Construction of the facility would disturb more than five acres of land, and EFSEC may require that the Whistling Ridge Energy Project obtain coverage under Ecology's Stormwater General Permit for construction activities.

If coverage is deemed necessary by EFSEC, at least 30 days prior to beginning construction, Whistling Ridge Energy LLC would develop and submit to EFSEC a notice of intent to be covered by Ecology's 2005 Construction Stormwater General Permit for discharges associated with construction. Pursuant to the general permit, Whistling Ridge Energy LLC would prepare SWPPPs that identify appropriate BMPs to reduce the pollution loadings resulting from construction activities and industrial operations. These BMPs would be incorporated into project design, and Whistling Ridge Energy LLC would ensure that they are observed during construction of the project. Monitoring and reporting would be carried out in accordance with permit requirements.

2.20.3.5 Approval for Over-Height and Over-Length Loads on State Highways

Department of Transportation
Road and Bridge Restrictions
Goldendale Office 509-773-4533

WSDOT has restrictions in place for portions of state highways that may be used for the transport of wind turbine equipment to the site. These load restrictions include limits on width, height, length, and weight, and vary depending on the specific roadway.

Compliance Plan

Whistling Ridge Energy LLC will work with WSDOT to select the preferred route for the transport of equipment from either the Port of Longview or the Port of Vancouver to the site. Options include

trucking, rail, and/or use of barges on the Columbia River. Depending on the option selected, the Applicant would comply with the requirements imposed by EFSEC and WSDOT.

2.20.3.6 Right of Way

Department of Transportation
Road and Bridge Restrictions
Goldendale Office 509-773-4533

There may be a need to improve and widen the turning radius of the intersection of SR 14 and Cook-Underwood Road for the deliver of turbines. Widening may require use of WSDOT right of way.

Compliance Plan

The Applicant will work with the WSDOT Goldendale Office to determine optimal intersection design and obtain right of way approval if necessary.

2.20.3.7 Water Well

Department of Ecology
Federal Safe Drinking Water Act; 42 USC § 300(f) Parts B & C
Ch. 18.104, 70.119A, and 90.44 RCW; Ch 173-160 and 246-291 WAC

Absent EFSEC jurisdiction, these matters would have been enforced by Ecology and Skamania County. Groundwater withdrawal wells for industrial use, including irrigation, of up to a maximum of 5,000 gallons per day are exempt from Ecology's water right permit requirements. However, these permit-exempt wells must still comply with the minimum construction standards set forth in Chapter 18.104 RCW and the "first in time, first in right" clause of Washington State Water Law. The well/property owner and the well driller share responsibility for ensuring compliance with the standards. A Notification of Intent to Construct a Water Well form would be submitted to Ecology at least 72 hours prior to well construction. The well driller must file a copy of a Water Well Report with Ecology upon completion of well construction and must attach a well identification tag to the well. Wells must be located at least 100 feet from septic tanks, privies, and other sources of contamination as specified in Chapter 173-160-171 WAC.

Wells to be used for potable water must receive an approved Water Availability Verification Evaluation (WAVE) from Skamania County Community Development Department in accordance with SCC 8.68 and SCC Title 15. Permit-exempt wells not meeting the elimination conditions in Chapter 246-291 WAC are classified as Group B Public Water Systems and subject to standards in SCC 8.68 as administered by Skamania Community Development.

Compliance Plan

Whistling Ridge Energy LLC will comply with the substantive requirements. It is anticipated based on past practice that EFSEC would coordinate with Ecology and Skamania County.

2.20.3.8 Archeological Sites

Washington State Office of Archaeology and Historic Preservation

The Washington State Office of Archaeology and Historic Protection regulates and protects the cultural and historic resources on private and public lands in the State of Washington. The applicable statute is: Archaeological Sites and Resources, Chapter 27.53 RCW.

Compliance Plan

The project will comply with Chapter 27.53 RCW. The Applicant has researched state and federal registries along with all archaeological and historical files and maps located at the Washington State Office of Archaeology and Historic Preservation in Olympia.

2.20.3.9 Electrical Construction Permit

Department of Labor and Industries
Ch. 296-46 WAC

The Department of Labor and Industries is responsible for inspection of electric wires and equipment within the Whistling Ridge Energy Project, and requires that electric wires and equipment comply with National Energy Code standards.

Compliance Plan

Whistling Ridge Energy LLC will design and construct the project in compliance with the applicable electrical regulations and standards to ensure that the project complies with Department of Labor and Industries inspection requirements. Whistling Ridge Energy LLC will coordinate with EFSEC to ensure all necessary Department of Labor and Industries inspections and approvals are obtained.

2.20.4 SKAMANIA COUNTY

2.20.4.1 Skamania County Building Permit

Skamania County Building Official
Title 15 SCC

Absent EFSEC jurisdiction, a building permit is required for construction of the turbine foundations and permanent buildings, including the Operations and Maintenance building, and placement of identifying signs.

Compliance Plan

Whistling Ridge Energy LLC will comply with the substantive requirements for the building permit. It is anticipated based on past practice that EFSEC would coordinate with Skamania County.

2.20.4.2 Zoning

Skamania County Community Development Department
Title 21 SCC

SCC Title 21 governs all unincorporated areas of Skamania County except those portions located within the General and Special Management Areas of the Columbia River Gorge National Scenic Area. The proposed project lies within three zones designated in the existing SCC Title 21 (Figure 4.2-1, Zoning Map). No portion of the project or roads requiring improvements are located~~lies~~ within the Scenic Area (Figure 2.1-1). ~~However, some of the proposed improvements to existing roads are proposed in the General Management Area (GMA) of the Scenic Area (see Figure 2.1-1). Scenic Area compliance for the road improvements is discussed in Section 4.2 of this Application.~~

Turbine corridor A1-A7 falls ~~into two zoning classifications. The south portion of the corridor, which could include up to a maximum of four turbines, is proposed in the Residential 10 (R-10) zone under SCC Title 21. The north portion of corridor A1-A7 will be in~~ within the Resource Production Zone (For/Ag 20). ~~A maximum of three turbines could be located in this zone.~~ The remaining turbine corridors are proposed in the unmapped zone. The alternative site for the Operations and Maintenance facility would be on land zoned Residential 5. Table 2.20-2 identifies the existing comprehensive plan designation and the zoning for each proposed turbine corridor in the project.

Table 2.20-2
Skamania County Zoning and Comprehensive Plan Designations for Proposed Turbine Corridors

Turbine Corridor	2007 Comprehensive Plan Designation	Zone Designation
A8-A13, B1-B21, C1-C8, D1-D3, E1-E2 and F1-F3	Conservancy	Unmapped (UNM)
~~North portion of~~ A1-A7 ~~(maximum 3 turbines)~~	Conservancy	Resource Production Zone (For/Ag-20)
~~South portion of A1-A7 (maximum of 4 turbines)~~	~~Conservancy~~	~~Residential 10 (R-10)~~
Alternative Operations and Maintenance Site Along West Pit Road	Rural II	Residential 5 (R-5)

Compliance Plan

Turbines located within the unmapped zone are permitted outright by the County, limited only by an inquiry concerning whether the use would constitute a "nuisance." Turbines located within the Resource Production Zone ~~and Residential Zone~~ are allowed by Conditional Use approval. The alternative location for the Operations and Maintenance facility would be on land zoned Residential 5, and would also be allowed by Conditional Use approval. Standards in SCC 21.40.050 and 21.56.050 include limitations as to lot size, density, setbacks, a 35-foot building height limit, off-street parking requirements, and prohibition of building location within easements. As proposed, the project meets all these requirements.

While EFSEC's jurisdiction and authority over local land use requirements and determinations is now well established, the analysis contained in Section 4.2.1 of this application demonstrates that, as

of the date of this application, the project can and does comply with the 2007 Comprehensive Plan, and both the zoning code in effect at the time of this Application (SCC Title 21). The Applicant anticipates this project will be fully consistent with the Skamania County Code and that it will meet local requirements.

2.20.4.3 Noise Regulations

Skamania County Sheriff Department
Ch. 8.22 SCC; Ch. 70.107 RCW; Ch. 173-60 WAC

Although no permit is required, absent EFSEC jurisdiction the Skamania County Sheriff Department would be responsible for noise control and abatement under SCC Title 8. SCC Title 8 relies on State standards established for maximum environmental noise levels. Permissible noise levels established by state and local regulation vary depending on the source of the noise (which in this case is "industrial") and the nature of the receiving environment (in this case, largely industrial and agricultural with some residential). Noise performance standards established by state regulation must be met during the construction and operation of the project.

Compliance Plan

The project will be designed to ensure that all noise generated will be below the applicable standards with noise mitigation measures. Modeling indicates that the Whistling Ridge Energy Project will meet all applicable noise regulations which will be enforced by EFSEC. See Section 4.1.1, Noise.

2.20.4.4 Critical Areas Ordinance

Skamania County Community Development Department
Ch. 21A SCC; Ch 36.70; 36.70A RCW

The Skamania County Critical Areas Ordinance would apply absent EFSEC Jurisdiction. SCC 21A.03.010 states that "no building, structure or land shall be used, and no building, structure or road shall be hereafter erected, altered or enlarged, including those proposed by State or Federal agencies, in any designated critical area governed by this title, except as allowed by this title." The Critical Areas Ordinance includes a number of exemptions that may be applicable. Proposed improvements to existing private roads will extend outside previously-disturbed areas within critical areas ~~outside the Scenic Area~~, so that they do not meet any of the allowed exemptions. SCC Title 21A would apply to the project. Two application types are established under SCC 21A.03.030:

1. Variances to buffers established under SCC 21A.04 governing watershed protection areas

2. Development reviews under SCC 21A.05 (Fish and Wildlife Protection Areas) and SCC 21A.06 (Geologically Hazardous Areas)

Compliance Plan

~~Title 21A does not apply in the Scenic Area.~~ West Pit Road crosses one unnamed drainage in the Lapham Creek watershed. This stream had observed flow through the existing culvert under West

Pit Road at the time of the July 2009 field visit. However, the surface flow and the channel disappear downstream of the culvert. West Pit Road and the underlying culver would be widened to allow access to the site by construction vehicles ~~No new construction will occur within streams or their buffers outside the Scenic Area.~~ The planned road improvements that will occur within stream buffers will result in expansion of existing roads to an extent that is less than 100% of the original footage. Thus, no variance would be required under SCC Title 21A.03.030(1) to complete the project according to SCC SCC 21A.020(B)(2)(g and i).

Critical area mitigation requirements, if necessary, are site-related, and may be implemented by EFSEC. EFSEC requirements related to critical areas would be similar to the substantive requirements resulting from the implementation of SCC Title 21A.03.030(2). Watershed protection areas (streams and wetlands) are addressed in Sections 3.3 Water, 3.4 Habitat, Vegetation, Fish and Wildlife, and 3.5 Wetlands. Fish and Wildlife Protection Areas are addressed in Section 3.3, Water. Geologically Hazardous Areas are addressed in Section 3.1, Earth.

2.20.4.5 Clearing and Grading Permit

Skamania County Community Development Department
Ch. 24 SCC; Ch 36.70; 36.70A RCW

Absent EFSEC jurisdiction, a Skamania County Clearing and Grading Permit would be required. A new Chapter of SCC, Title 24 Clearing and Grading, was adopted by the Skamania Board of County Commissioners in February 2008. All grading activity not exempted under SCC 24.02.060 would be prohibited without first obtaining a Clearing and Grading Permit under SCC Title 24.

Compliance Plan

Detailed clearing and grading plans prepared by an Engineer licensed in the State of Washington will be prepared and submitted to EFSEC for review and approval prior to the start of construction. These plans will substantively comply with SCC Title 24 standards.

2.20.4.6 Water Availability Verification Evaluation and Group B Public Water System Approval

Skamania County Community Development Department
Ch. 8.68 and 15 SCC; Ch 50.56 and 70.119A; Ch 246-291 WAC

Absent EFSEC jurisdiction, a Group B Public Water System Approval would be required for permit-exempt industrial water wells that may be used as a drinking water source. The Operations and Maintenance facility proposed in conjunction with the project would be used as such a source.

To document proof of potable water, a WAVE approval would be required from Skamania Community Development.

Compliance Plan

The project will comply with applicable potable water and Group B Water System Standards. Based on past practice, it is anticipated that EFSEC will coordinate with Skamania County and Ecology.

2.20.4.7 On-Site Septic System Site Evaluation and Design Review

Skamania County Community Development Department
Ch. 70.118 RCW; Ch. 246-272A WAC; Federal Safe Drinking Water Act 42 USC § 300(f) Parts B & C

Absent EFSEC jurisdiction, Skamania Community Development would be responsible for ensuring site and design standards identified in WAC 246-272A are met. Generally, a Site Evaluation is requested to determine the type of system required prior to installation of a new on-site septic system. A Site Evaluation Results Letter is issued, which is valid for one year. The project proponent must then hire a qualified on-site septic system designer to design a system for the site in accordance with the Site Evaluation Results Letter. The design must then be submitted for Design Review. An approved Design Review is valid for five years from the date of issuance. Extensions may be granted under certain circumstances.

Compliance Plan

The project site will be evaluated as to applicable on-site septic system design standards and all systems will comply with these standards. It is anticipated that EFSEC will coordinate with Skamania County.

2.20.4.8 Road Approach Permit and Private Road Requirements

Skamania County Public Works Department
Ch 12.03 SCC; Skamania County Road Approach and Private Roads Standards Development Assistance Manual

The proposed road improvements to West Pit Road required to access and construct the project include modifications to existing logging roads and new construction outside the Scenic Area. ~~Improvements to an unnamed private road within the Scenic Area also are proposed. County Assessor's maps identify the existing road in the Scenic Area as CG2930 (County Assessor maps 3-10, 3-10-19, 3-10-20). Figure 4-1 of the 2007 Skamania County Comprehensive Plan does not include the CG2930 road as part of the system of County roads.~~ West Pit Road is an existing private logging road. All private roads in Skamania County must comply with guidelines in the Private Road Guidelines and Development Assistance Manual adopted by County Resolution in 2008 (SCC Title 12.03.030) "where a proposed change in use converts a private driveway (Category 1 road) to a higher category road (SCC 21.03.070)." Also, a road approach permit is required where a private road enters a County road.

SCC 12.03 classifies private roads by use (12.03.030). Current use of the ~~CG2930~~ West Pit Road ~~road~~ is for access to ongoing forest operations taking place ~~in and~~ outside the Scenic Area. No homes are accessed via this road. Because it accesses fewer than four homes, ~~the CG2930 road~~West Pit Road is a Category 1 road under SCC 21.03.030. ~~Existing logging roads outside the Scenic Area are also currently Category 1 roads.~~

The Applicant's proposed wind energy facility would establish a new use on property outside the Scenic Area. It is not likely this change in use will convert the existing Category 1 roads to

Category 6 roads (SCC 21.03.030). However, construction of the project would have impacts to existing County roads and to existing Category 1 private roads that would require road upgrades and repair before, during and after construction. The specifics of this work would be determined through negotiation of a Haul Route Agreement with the County Engineer, which will be approved by the Board of County Commissioners.

A Road Approach Permit ~~would~~ may be required where the ~~CG2930 road~~ new connection of West Pit Road enters ~~Scoggins~~ Willard Road. The specific requirements of this permit would be negotiated with the County Engineer and would likely exceed Category 6 (commercial) private road approach requirements due to the nature of the project. However, it is also likely the project's access road would not be required to meet Category 6 standards for its full length as traffic volumes will remain very low.

Compliance Plan

Whistling Ridge Energy LLC will comply with Skamania County Private Road Requirements as administered through EFSEC. A Haul Route agreement and Road Approach permit will be negotiated to protect and repair Skamania County roads.

~~2.20.4.9Columbia Gorge National Scenic Area Permit~~

~~*Skamania County Community Development Department*~~
~~*Chapter 22.14 SCC*~~

~~The Applicant proposes minor upgrades to access roads located on private lands (owned and controlled by S.D.S. Co., LLC), situated within the Columbia River Gorge National Scenic Area. No portion of the wind turbine generator corridors or any related facilities are proposed within the Scenic Area, and the Scenic Area does not regulate any development activity proposed outside the Scenic Area boundary.~~

~~Columbia River Gorge National Scenic Area Permit Requirements~~

~~The Columbia River Gorge National Scenic Area Act places restrictions on development within the Scenic Area. The boundaries of the Scenic Area are defined in the Act by reference to a "map entitled 'Boundary Map, Columbia River Gorge National Scenic Area,' numbered NSA-001 sheets 1 and 2, and dated September 1986," which is on file with the Commission. Additionally, S.D.S. Co., LLC had the Scenic Area boundary surveyed by Terra Surveying, a licensed land surveyor, in 2006 and 2007. This survey was reviewed for accuracy by USFS Surveyor Don Karsch, who is responsible for reviewing such surveys to establish the Scenic Area boundaries. The survey was accepted by the USFS and recorded in Skamania County with an Auditor's File Number of 2007167932. Certain uses are allowed without review, but some uses require prior approval and others are prohibited. The restrictions depend, in part, on whether the proposed use will take place in the General Management Area (GMA) or a Special Management Area (SMA). The boundaries of the SMAs are defined in the Act by reference to a "map entitled 'Special Management Areas, Columbia River Gorge National Scenic Area,' numbered SMA-002 sheets 1 through 17, and dated September 1986," which is on file with the Commission.~~

~~The proposed access to the site would be via an existing private logging road, listed as CG2930, connecting to Scoggins Road, which is a County road. CG2930 is currently narrow, approximately 10 to 12 feet wide, and will require permanent widening to a minimum drivable section width of 16 feet with allowance for side slope and drainage from Scoggins Road to the proposed project site (see Figures 4.3-17 through 4.3-25 in Section 4.3). Widening would require possible removal of trees, and possible engineered fill and embankment cut sections. The engineered fill and embankment cut sections would not require paving, but would require an all-weather driving surface. There are two sharp left hand turns in the roadway enroute to the proposed project site (Figures 4.3-17, 4.3-23, and 4.3-24) that will require additional special considerations to accommodate the required truck turning radii for transport of the wind energy blades to the site. Road CG2930 is located within the CRGNSA and approval would be required under applicable standards in conjunction with SEPA and building permit approvals before making roadway improvements.~~

~~Certain uses are allowed without review in both the GMA and SMAs, including repair, maintenance and operation of roads. A person can also resurface or overlay existing paved roads and grade and gravel existing road shoulders, provided that the activity does not: (i) increase the width of the road; (ii) disturb the toe of adjacent embankments, slopes or cut banks; or (iii) change the existing structures or add new structures. Forest practices, including the construction of roads, are also allowed in the GMA as long as the practices do not violate conditions of approval for other approved uses and developments. However, a forest practice must relate to growing, harvesting, or processing timber.~~

~~The road improvements proposed within the Scenic Area do not fall within any of these exemption categories. The Applicant needs to improve, rather than repair, maintain, or operate, the road. Further, the necessary improvements include widening the existing road. While "forest practices" is a broad category that includes road construction, the improvement of roads for wind energy facility construction does not fall within the definition because wind energy facilities do not relate specifically to growing, harvesting, or processing timber.~~

~~The Applicant's road improvements fall within the category of uses that "may be allowed subject to review by the County Administrator for compliance with all applicable provisions protecting scenic, cultural, natural and recreation resources." In SMAs, the use must also be sited to minimize the loss of land suitable for the production of forest products. Uses the Administrator may allow subject to review on GMA lands designated as large-scale agriculture, commercial forest, large woodlands, or small woodlands include construction, reconstruction or modification of roads, not in conjunction with forest use or forest practices. Uses the Administrator may allow subject to review on SMA lands designated as forest include road and railroad construction and reconstruction. Therefore, but for EFSEC consideration of the ASC, the improvements would subject to an administrative review and approval, regardless of whether the road is located in the GMA or SMAs.~~

~~Compliance Plan~~

~~The Applicant proposes minor upgrades to access roads located on private lands (owned and controlled by S.D.S. Co., LLC) and County rights of way, all of which are situated within the Scenic Area GMA. No portion of the wind turbine generator corridors or any related facilities are proposed within the Scenic Area, and the Scenic Area does not regulate any development activity proposed outside the Scenic Area boundary. In a non-EFSEC application, applicable approvals for road~~

~~improvement work within the Scenic Area would be administered through Skamania Community Development, with appeal to the Columbia River Gorge Commission, and ultimately resolved through the State of Washington judicial appeals system. Pursuant to RCW Ch. 80.50, in this Application, the EFSEC process preempts the local process for approval of the road improvements within the Scenic Area. However, the Applicant plans to comply with all requirements set forth below by satisfying the EFSEC that all Scenic Area requirements can be met through the EFSEC application process.~~

~~Whistling Ridge Energy LLC has included information within this Application that demonstrates project compliance with the requirements of the Scenic Area for the proposed roadway improvements. See Sections 3.1 Earth, 3.3 Water, 3.4 Habitat, Vegetation, Fish and Wildlife, 3.5 Wetlands, 4.2 Land and Shoreline Use, and 4.3 Transportation.~~