

CHAPTER 2: PROPOSED ACTION AND OFF-SITE ALTERNATIVES

2.1 INTRODUCTION

This chapter presents information concerning the Applicant; briefly describes the Applicant's proposal, including the project location and project facilities, and discusses reasonable off-site alternatives considered by EFSEC. The information presented in this section is primarily based on information provided by the Applicant in the ASC (Sagebrush Power Partners LLC 2003a, and 2003b), the Wild Horse Wind Power Project ASC submitted to EFSEC in March 2004 (Wind Ridge Power Partners, 2004), the Draft EIS developed by Kittitas County for the Desert Claim Wind Power Project (Kittitas County, 2003), the Wild Horse Wind Power Project Off-Site Alternatives Analysis (Jones and Stokes, 2004a); and the Wild Horse Wind Power Project Off-Site Alternatives Impact Analysis (Jones and Stokes, 2004b).

2.1.1 The Applicant

The Applicant for the Kittitas Valley Wind Power Project is Sagebrush Power Partners LLC, a wholly owned subsidiary of Zilkha Renewable Energy.

2.1.2 Scope of this Supplemental EIS

Draft Environmental Impact Statement

In January, 2003, Sagebrush Power Partners submitted an Application for Site Certification to EFSEC for the Kittitas Valley Wind Power Project. The SEPA scoping process for the Project was completed on March 14, 2003. The scope of the Draft EIS consisted of: a description of the proposed action and alternatives; a discussion of the affected environment; an evaluation of the project's potential direct, indirect, and cumulative impacts; and an identification of suitable mitigation measures associated with the construction, operation, maintenance, and decommissioning of all components (and connected actions) of the proposed project, including the turbines, electrical collector infrastructure, substations, access roads, operations and maintenance facility, and meteorological towers.

The Draft EIS evaluated the potential impacts from construction and operation of the Project and connected actions on the following elements of the natural and built environment:

- Earth Resources
- Vegetation, Wetlands, Wildlife and Habitat, Fisheries, and Threatened and Endangered Species
- Water Resources
- Health and Safety
- Energy and Natural Resources
- Land Use and Recreation
- Socioeconomics
- Cultural Resources
- Visual Resources

- Transportation
- Air Quality
- Noise
- Public Services and Utilities

A Public comment meeting was held in Ellensburg, Washington on January 13, 2004, and public comment on the Draft EIS was completed on January 20, 2004. Over 100 comment letters and oral comments were received, and are being considered by EFSEC. Responses to the comments will appear in a Final EIS to be issued after conclusion of EFSEC's adjudicative proceeding in late 2004.

Draft Supplemental Environmental Impact Statement

The purpose of this Draft SEIS is to present an analysis of the impacts on the natural and built environment assuming a project similar to the KVVPP were constructed and operated on these alternative sites. The scope of this SEIS therefore consists of: a description of the process used to identify reasonable off-site alternatives; a brief description of the sites selected for analysis as alternatives; a description of the affected environment for each off-site alternative; and a description of the impacts to the environment for each off-site alternative.

This Draft SEIS has been issued for public comment. Following the adjudicative proceeding required by Chapter 80.50 RCW, the Draft EIS and Draft SEIS will be incorporated into a single Final EIS. The Final EIS will also address both comments on the Draft EIS and the Draft SEIS.

This Draft SEIS will not repeat detailed information about the Project Action, No-Action Alternative, affected environment, and analysis of project impacts on elements of the environment, unless new information has become available since issuance of the DEIS. However, summaries of the information in the DEIS are presented for context.

2.2 DESCRIPTION OF PROPOSED ACTION

2.2.1 Project Overview

A complete description of the Kittitas Valley Wind Power Project is included in the Draft EIS. Sagebrush Power Partners LLC proposes to construct and operate a wind generation facility that would produce 181.5 to 246 megawatts of power, which would be sold through long term power purchase contracts. Elements of the project include wind turbine generators, roads, foundations, underground and overhead electrical lines, grid interconnection facilities, one or two substations, an operations and maintenance (O&M) facility, and associated supporting infrastructure and facilities. Figure 2-1 illustrates the general site layout of these key elements.

Figure 2-1

The expected service life of the facility is 20 years, with the possibility of upgrade of older equipment with more efficient turbines (repowering) after the initial 20-year period.

The project site is located on open ridgetops between Ellensburg and Cle Elum, about 12 miles northwest of the City of Ellensburg in Kittitas County, Washington. The estimated 90-acre project site lies within an area covering approximately 3.5 miles (east-west) by 5 miles (north-south). Project site ridges rise as high as 1,300 feet above the surrounding valley floor. The center of the site is located approximately at the intersection of the main Bonneville Power Administration (Bonneville) and Puget Sound Energy (PSE) east-west transmission line corridors with US 97.

Wind Generation Turbines

The project would install three-bladed wind turbines on tubular steel towers ranging in size from 1.3 MW to 3 MW (generator nameplate capacity). The Applicant has requested the ability to select the exact make and model of wind turbine to be used depending on a number of factors including equipment availability at the time of construction. The number of turbines and the resulting nameplate capacity of the project would therefore depend on the type of technology used. To capture a “reasonable range” of potential project impacts, the Draft EIS defined and evaluated the following three project scenarios:

- Lower End Scenario, representing the project configuration with the lowest number of turbines erected. For turbines with a nameplate capacity of 3 MW, up to 82 turbines would be used, resulting in nameplate capacity of 246 MW.
- Middle Scenario, representing the project configuration that would be chosen based on current pricing and performance for wind turbine technology presently on the market. For turbines with a nameplate capacity of 1.5 MW each, 121 turbines would be used for a total for a total of 181.5 MW. This scenario is illustrated in Figure 2-1.
- Upper End Scenario, representing the project configuration with the highest number of turbines erected. For turbines with a nameplate capacity of 1.3 MW each, up to 150 turbines would be used, resulting in a project total nameplate capacity of 195 MW.

The permanent project footprint (for the life of the project) would occupy between 93 and 118 acres for wind turbines, access roads, substations, and other facilities. Between approximately 231 and 371 acres would be temporarily occupied during construction by facilities such as staging areas and equipment laydown areas. The only features that would vary in size between the three project scenarios would be the temporary laydown areas at each wind turbine during construction and the permanent roadway and turbine and transformer pad footprints; under the lower end scenario, roads would be wider to accommodate larger construction cranes. The amount of land disturbance required for the operations and maintenance facility, substations, and meteorological towers would not change under the three scenarios.

The turbines would be arranged in numerous “strings” labeled A through J throughout the project site, for a maximum of 23 total miles of turbine strings (Figure 2-1). The length of the 10 turbine strings would remain constant under the three project scenarios; only the density of turbines sited within each string would change. The height of the turbines (referred to as the “tip height”)

would range from about 260 feet to 410 feet from the ground to the blade tip in its highest position, depending on the turbine size selected. In any scenario chosen by the Applicant only a single size of turbines would be used; different sizes of turbines would not be mixed. The diameter of the circle swept by the blades would range from approximately 200 to 300 feet under the upper and lower end scenarios, respectively (that is, each blade would be approximately 100 to 150 feet long). The blades would turn at about 10 to 23 rotations per minute (RPM), with the larger turbines having slower rates of rotation.

The property ownership shown in Figure 2-1 was developed at the time the ASC was prepared (January 2003). The Draft EIS indicated property ownership changes through September 2003.

Access Roads

To access and service the wind turbines and other facilities at the site, up to 7 miles of existing private roads would be improved, and up to 19 miles of new access roads would be constructed. Roads would be 24 to 34 feet wide depending on the size of turbine selected.

Electrical System and Regional Transmission Interconnection

The project's electrical system would have two key elements: (1) a collector system, which would collect energy at between 575 and 690 volts (V) from each wind turbine (depending on the type of turbine used), increase it to 34.5 kilovolts (kV) through a pad-mounted transformer, and connect to the project substations; and (2) the substations and interconnection facilities, which would transform energy from the collection lines (at 34.5 kV) to the transmission level (230 kV for the PSE line and Bonneville's Columbia to Covington line or 287 kV for Bonneville's Grand Coulee to Olympia line). Approximately 23 miles of underground and 2 miles of overhead 34.5-kV electrical power lines would be used to collect power from the turbines and terminate at the main substation.

The project could interconnect with either the PSE or Bonneville electrical transmission lines traversing the site or possibly both. If connected to Bonneville's system, the project would interconnect directly with either the Grand Coulee to Olympia 287-kV line or the Columbia to Covington 230-kV line. If connected to PSE's system, the project would interconnect directly with PSE's Rocky Reach to White River 230-kV line.

Operation and Maintenance Facility

One Operation and Maintenance (O&M) facility, approximately 5,000 square feet on a 2-acre site, also would be constructed. An information kiosk and public viewing area near the proposed O&M facility off Bettas Road would be constructed. Signs would be provided to direct tourists to this site. Vehicle access to the information kiosk and public viewing area would occur from Bettas Road at the same location as the access to the O&M facility.

Meteorological Towers

The Applicant proposes to erect up to nine permanent meteorological towers in the project area, although it is likely that only four would be constructed. The permanent meteorological towers installed for the project would be approximately as tall as the turbine tower hub height (i.e., 150 to 262 feet) and would consist of a central lattice structure supported by three to four sets of guy wires that extend up to 100 to 210 feet from the base of each tower, on a 16-foot-by-16-foot base. The towers may alternatively be of a free standing design.

Project Setbacks

The Applicant has proposed setbacks for the project's proposed turbine towers as follows (Sagebrush Power Partners LLC, 2003b):

- Setback from residences of neighboring landowners (i.e., those without signed agreements with the Applicant): 1,000 feet.
- Setback from property lines of neighboring landowners: 50 feet beyond the tip of the blade at its closest point to the property line.
- Setback from county/state roads: Turbine tip height.
- Setback from residences with signed agreements with the Applicant: At least blade tip height. However, it may be greater (less?) based on the property owner's approval. Some landowners want to have turbines closer than 1,000 feet to their residence in exchange for more turbines on their land and the revenue generated by them.
- Setback from property lines of landowners with signed agreements with the Applicant: None. All property owners with signed agreements with the Applicant have agreed to a zero setback from property lines, as this allows the most efficient and lowest impact of wind turbines on various landowners' property.
- Setback from Bonneville/PSE transmission lines: Blade tip height.

If the final turbine selected for the project is larger or smaller than the turbine scenario layout presented in Figure 2-1 (the middle scenario), minor adjustments would be made to the proposed project layout such as moving the turbine tower foundations to maintain the setbacks described above. The proposed setback for the meteorological towers from public roads and residences is tip height. There are no designated setbacks for the other project components such as the O&M facility, substations, and gravel access roads.

2.3 DESCRIPTION OF NO ACTION ALTERNATIVE

Under the No Action Alternative, the project would not be constructed or operated, and the environmental impacts described in this EIS would not occur. The No Action Alternative assumes that future development would comply with existing zoning requirements for the project area, which is zoned Agriculture-20 and Forest and Range. According to the County's zoning code, the Agriculture-20 zone is dominated by farming, ranching, and rural lifestyles, and permitted uses include residential and agriculture and forestry practices. Permitted uses in the Forest and Range zone include logging, mining, quarrying, and agricultural practices, as well as residential uses (Kittitas County, 1991). However, if the proposed project is not constructed, it is

likely that the region's need for power would be addressed by the development of a gas-fired combustion turbine. Such development could occur at conducive locations throughout the state of Washington. Because constructing and operating a gas-fired combustion turbine is a predictable consequence of not building the project, it is considered a predictable outcome of the No Action Alternative (Bonneville et al., 2002).

Because the project has a nameplate capacity of approximately 181.5 MW (under the anticipated middle scenario) and is expected to have a 33% net capacity factor, a natural gas-fired combustion turbine would have to generate 60 average MW of base-load energy to replace an equivalent amount of power generated by the project.

2.4 ALTERNATIVES CONSIDERED BUT REJECTED

During the development phase of this project, the Applicant considered alternative wind turbine technologies to be used, alternative wind turbine locations, and an alternative project layout. These alternatives considered but rejected were described in detail in the Draft EIS. Additional technologies or turbine layouts have not been brought forward since issuance of the Draft EIS.

2.5 CONSIDERATION OF OFF-SITE ALTERNATIVES

Prior to Issuance of the KVVPP Draft EIS, EFSEC coordinated the evaluation of off-site alternative sites in Kittitas County with Kittitas County. Four broad geographic areas were defined for investigation: west of US 97, east of US 97, Whiskey Dick Mountain, and south of Whiskey Dick/Boylston Mountains. The four areas were then compared against five key suitability criteria: (1) sufficient wind resource (the most important); (2) proximate/adequate transmission facilities; (3) large land area; (4) absence of significant environmental constraints; and (5) property owner interest.

EFSEC re-examined the four previous sites considered in the KVVPP Draft EIS, namely Springwood Ranch, Swauk Valley Ranch, Manastash Ridge, and the Boylston Mountains, and two new sites, Skookumchuck Creek and Quilomene (Jones and Stokes 2004a). These sites were then evaluated against five criteria that are generally necessary for a site to be amenable for wind farm development. Two of the four sites, Swauk Valley and Springwood Ranch, were selected for further off-site alternative analysis, as were the Wild Horse Wind Power Project, and the Desert Claim Project.

2.5.1 Process for Identifying Off-site Alternatives

The methodology used to identify and evaluate off-site locations for KVVPP was modeled after the approach used in the Desert Claim Wind Power Project Draft EIS developed by Kittitas County. The objective of the investigation was to identify wind resource sites within Kittitas County that could accommodate a wind power project in the megawatt size range and project footprint of the "Middle Scenario" for the KVVPP (i.e. 121 wind turbines and a permanent project footprint of 93 acres). The permanent project footprint for the "middle scenario" would include 23 miles of gravel surfaced access roads, 121 turbine tower foundations, underground and overhead electrical lines, grid interconnection substations, step-up substations, feeder lines

from the on-site step-up substations to the interconnection substations, an operations and maintenance center and supporting infrastructure.

In order to be considered as a potential off-site location, a site had to generally meet the following criteria:

Minimum average wind speed of 16 mph. In the Pacific Northwest, the site for a potential wind power facility must have a minimum average wind speed between 15 to 17 miles per hour to be considered economically viable. Potential sites are initially identified using wind energy maps, such as those published by the U.S. Department of Energy's National Renewable Energy Laboratory (NREL). Promising sites undergo intensive meteorological investigations, typically over a one to two year period. Once a site is selected, a computer model is used to identify the optimal location for each turbine.

Existing 115kV or 230 kV transmission line with unused capacity within 10 miles of site. Wind energy projects must connect to an electric transmission line to deliver power to the regional power grid. The costs associated with constructing a transmission line much further than 10 miles to connect to the regional grid can make a site financially impractical.

Large undivided parcels of land totaling a minimum of approximately 6,000 acres. The amount of land required for a wind power project is directly related to the size of the project (in terms of power output) and the size and number of turbines. Large parcels in rural or agricultural settings with a dispersed population are preferred and tend to minimize the potential for land use conflicts.

Kittitas County zoning classification of AG 20, Commercial AG, or Forest and Range. The zoning classifications of AG 20, Commercial AG and Forest and Range are associated with land uses that are generally compatible with wind farm development. The Kittitas County Zoning Code (Title 17) includes a Wind Farm Resource Overlay Zone that can be applied to any zone as long as the proposed site is appropriate, the welfare of the public can be protected and the wind farm is compatible with nearby land uses.

Absence of significant environmental constraints or conflicting land uses. Examples of significant on-site environmental constraints include lakes, rivers and streams; wetlands; critical habitat; or recorded cultural or archaeological resources. Conflicting land uses include parks, recreation areas and wildlife refuges. Sites with significant environmental constraints or conflicting land uses typically experience higher construction costs. Such sites are also subject to a complicated federal, state and local permitting process that can be time-consuming and unpredictable. It is often best to entirely avoid sites burdened with substantial environmental constraints or conflicting land uses.

Consideration of alternatives has been limited to sites within Kittitas County, based on EFSEC's requirement to consider alternative locations within the same county where the project has been proposed (WAC 463-28-040 (3)).

A variety of Geographic Information System (GIS) files for Kittitas County were obtained to assist with identifying potential wind power sites. Wind speed data was obtained from the U.S. Department of Energy National Renewable Energy Laboratory (NREL). NREL wind data for potential sites was reviewed and validated by a professional meteorologist with extensive knowledge of wind conditions in Kittitas County (Jones and Stokes, 2004a).

Information on transmission line locations was obtained from the Bonneville Power Administration. GIS mapping showing parcel boundaries, zoning designations, parks and recreation land, and wildlife refuges were obtained from Kittitas County. Information on wetlands was obtained from the USFWS National Wetland Inventory and Kittitas County. Information on Priority Habitats was obtained from the Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species Database.

A total of six potential off-site locations were identified using the criteria and GIS mapping described above. These sites include Springwood Ranch, Swauk Valley Ranch, Manastash Ridge, Boylston Mountains and two new sites—Skookumchuck and Quilomene. Figure 2-2 shows the locations of these off-site alternatives in relation to one another.

2.5.2 Results of Site Screening Process

Table 2-1 summarizes how the off-site alternatives compare to each other relative to the five major screening criteria described in the previous section. A brief summary for each site is presented below. It should be noted that NREL wind maps for Kittitas County have been found to have an average error of +/-2.5 mph in most locations. In particular, the NREL maps tend to over-estimate wind speeds at higher elevations (Nierenberg, 2004).

Figure 2-2

Table 2-1 Summary of Initial Screen Findings

Screening Criteria	Springwood Ranch	Swauk Valley Ranch	Manastash Ridge	Boylston Mountains	Skookumchuck Creek	Quilomene
Minimum average wind speed of 16 mph	"Good 15.7 – 16.8 mph"	"Good 15.7 – 16.8 mph"	"Good 15.7 – 16.8 mph"	"Good 15.7 – 16.8 mph"	"Good 15.7 – 16.8 mph"	"Good 15.7 – 16.8 mph"
Existing transmission line within 10 miles of site	Existing line located approx. 1.5 miles north of site across the Yakima River.	Existing line crosses through center of the site.	Two existing lines are located within 3 miles of the site.	Existing line approx. 2 to 3 miles east of site across the Columbia River.	Closest line is approx. 6 miles east of site, across the Columbia River.	Closest line is approx. 8 miles east of site across the Columbia River.
Large undivided parcels of land totaling approx. 6,000 acres	Most parcels within site are moderate in size (~1/8 ac.). Total size ~4,200 acres.	Most parcels are large. Some smaller parcels in central portion of site. Total size >6,000 acres.	Most parcels are very large. Total size >6,000 acres.	Large parcels. Total size >6000acres	Large parcels. Total size >6,000 acres	Checkerboard site comprised of seven or more very large 1-square mile parcels. Total size ~5,000 acres.
Zoning: AG20, Commercial AG, or Forest and Range	Primarily Forest and Range, some Commercial AG and AG20.	Forest and Range	Commercial Forest	Commercial AG. Site currently used for military training.	Forest and Range	Commercial AG and Forest and Range.
Absence of significant environmental constraints	Taneum Creek crosses site and Yakima River borders eastern edge, riparian habitat, anadromous fish habitat, scattered wetlands and steep slopes, two recorded archaeological sites.	Numerous small streams, small lakes and scattered wetlands. Western bluebird nesting, several DNR-designated plant communities, designated mule deer and black-tailed deer habitat. No recorded archaeological sites. Northern portion of site is designated as Nature Conservancy easement.	South Fork Manastash Creek crosses site and provided priority fish habitat, scattered small lakes, wetlands and steep slopes. Site supports elk, mule/black-tailed deer and bighorn sheep three recorded archaeological sites.	Numerous springs, small streams, and scattered wetlands. Site supports mule deer and chuckar partridge, nesting for Swainson's hawk, prairie falcon, and peregrine falcon and four sensitive plant communities Fifty-six recorded archaeological sites.	Situated between 2 wildlife areas. Skookumchuck Creek flows eastward through the center of the site. Site supports mule deer, elk, bighorn sheep and two sensitive plant species. No known archaeological sites.	Two streams and 3 archaeological sites Site supports shrub-steppe, mule deer, elk, and two sensitive plant species. Adjacent to Quilomene Wildlife Rec. Area and Ginkgo State Park and Petrified Forest.

Swauk Valley Ranch

The Swauk Valley Ranch site is located north of the Yakima River approximately 12 miles northwest of the City of Ellensburg in the vicinity of Lookout Mountain (Figure 2-3a). Topography on the 6,000 plus acre site is gently rolling to steep. Typical elevations range from 500 m to 1000 m above sea level.

The NREL wind maps show the quality of wind resources on the site falling primarily in the “Good 15.7 – 16.8 mph” range with a few upper elevation locations falling into the “Excellent 16.8 - 17.9 mph” and “Outstanding 17.9 – 19.7 mph” categories. However, wind data from other public domain and confidential sources suggest a more accurate rating for the site would be “Good 15.7 – 16.8 mph.” A transmission line crosses through the center of the site in an east-west direction.

Several streams and small lakes are located on the site. Kittitas County wetlands maps identify nine wetlands on the site ranging from ¼ acre to slightly more than three acres. WDFW identified approximately 220 acres of the northern portion of the site as western bluebird nesting habitat (a WDFW Monitor Species) and [oak woodland as Priority Habitat Several reword] DNR-designated Natural Heritage Areas (thyme buckwheat/Sandberg’s bluegrass, Ponderosa pine/common snowberry, and Oregon oak/Geyer’s sedge plant communities) lie? Are located? along the eastern edge of the site. WDFW also indicated all of the site as mule deer/black-tailed deer habitat and the northern portion as elk habitat (WDFW 2004).

No recorded archaeological sites are located within the boundaries of Swauk Valley Ranch, however, 11 sites are located within a one-mile radius of the site. Most of the site is composed of large parcels (i.e. greater than 1/8 section). Fifteen or so smaller parcels are located in the central portion of the site. Land cover on southern half of the site is a mixture of grasslands and shrublands while the northern half of the site is dominated by Conifer forest. The entire site is zoned Forest and Range. A large part of the site in the northern panhandle (over 3 square miles) is designated as a Nature Conservancy easement and is off limits to development.

Springwood Ranch

Springwood Ranch is an approximately 3,610-acre site located approximately one-half mile northwest from the town of Thorp and 10 miles northwest of Ellensburg. Springwood Ranch is bounded by I-90 (or Thorp Prairie Road) on the south and the Yakima River on the north (Figure 2-3b). The western end of the property abuts the Sunlight Waters community, in the Elk Heights area. The Iron Horse State Park/John Wayne Trail runs adjacent to or through the northern and eastern edge of the site. The northern boundary of the L. T. Murray Wildlife Recreation Area, managed by WDFW, is located near the site but south of I-90.

The topography of most of the site is gently rolling, but steep bluffs and numerous canyons are located along the northern and eastern edges of the site. Typical elevations on the site range from 500 m to 800 m above sea level. Taneum Creek runs in a southwest/northeast direction through the eastern one-third of the site. The predominantly upland terrain on the site drops

Figure 2-3a

Figure 2-3b

approximately 200 feet to the valley along Taneum Creek, causing a wind shadow over the eastern third of the property.

The quality of wind resources on the site fall primarily in the “Good 15.7 – 16.8 mph” category based on NREL wind speed maps. A Bonneville transmission line is located approximately 1.5 miles north of the site across the Yakima River.

A tributary to the Yakima River (Taneum Creek) cuts across the southern half of the site in a southwest/northeast direction. Several smaller streams and irrigation canals are scattered across the site. Nationwide Wetland Inventory maps identify numerous (up to 20) wetlands on the site ranging from less than three acres to approximately eight acres. Most wetlands are associated with irrigation channels or excavated ponds. Both the Yakima River and Taneum Creek are designated by the WDFW as Priority Habitat for anadromous spawning and rearing. Riparian habitat along the entire length of Taneum Creek within the Springwood Ranch site is designated as Priority Habitat, as are portions of the Yakima River on the eastern boundary of the site (WDFW 2004). Habitat on the site would support animals adapted to open grasslands or the ecotone between forest and grasslands. The Yakima River in this vicinity supports one run of spring chinook salmon. Several species of trout, including bull and steelhead, have been reported. Lower Taneum Creek has been historically used by resident trout and anadromous fish for spawning and rearing. Taneum Creek is listed as “water quality limited” surface waters (for temperature and instream flow) under section 303 (d) of the federal Clean Water Act.

Two recorded archaeological sites are located within the boundaries of Springwood Ranch and eight sites are located within a one-mile radius of the site.

The surrounding area is primarily rural/agricultural (designated Forest Multiple Use and Agriculture in the Kittitas County Comprehensive Plan, and zoned Agriculture-20 and Forest and Range). A small cluster of commercial uses is located at Thorp (designated an Urban Growth Node [UGN] in the Kittitas County Comprehensive Plan). Most of the site is zoned Forest and Range and a small portion of the site east of Taneum Creek is zoned Commercial Agriculture and AG-20. A ranch house and several accessory structures and outbuildings are located onsite. Most parcels within the boundaries of the site are moderate in size (i.e. greater than 1/8 section). A few isolated residential and commercial land uses can be found around the perimeter of the site. Existing land cover includes substantial amounts of pastureland on the southern portion of the site and grasslands and shrublands on the northern portion of the site. A narrow band of Conifer forest is located along the Yakima River along the site’s northern boundary.

Manastash Ridge

The Manastash Ridge site is located south of I-90 and west of the Yakima River approximately 12 miles from the City of Ellensburg (Figure 2-3c). The 6,000 plus acre site is situated between the L.T. Murray Wildlife Recreation Area and the Wenatchee National Forest. Site topography is generally steep with typical elevations ranging from 500 m to 1500 m above sea level.

Figure 2-3c

Wind resources are clustered in the northern and southern portions of the site ranging primarily from the “Good 15.7 – 16.8 mph” range to a few locations in the “Excellent 16.8 - 17.9 mph” and “Outstanding 17.9 – 19.7 mph” range based on NREL wind speed maps. Similar concerns over the positive bias of the NREL data for higher elevations suggest the “Excellent” and “Outstanding” ratings should be downgraded to “Good.” Two transmission lines are located approximately three miles from the site--one to the north and one to the east.

South Fork Manastash Creek flows eastward through the center of the site. Numerous other streams and small lakes are located on the site. Kittitas County wetlands maps identify four wetlands on the site ranging from less than ¼ acre to 4.5 acres. The South Fork Manastash Creek is designated by the WDFW as Priority Fish Habitat for its entire length with the site. WDFW also indicated the eastern and southern portions of the site as cliff habitat and bighorn sheep Priority Habitat, and much of the site north of the South Fork Manastash Creek as elk and mule deer/black-tailed deer habitat (WDFW 2004).

Three recorded archaeological sites are located within the boundaries of Manastash Ridge and 21 sites are located within a one-mile radius of the site. Most of the site is made up of large parcels (i.e. greater than 1/4 section). The land cover is a heterogeneous mixture of grasslands, shrublands, and Conifer forest and the entire site is zoned Commercial Forest.

Boylston Mountains

The Boylston Mountains site is located along an east-west trending ridge within the Yakima Firing Center Military Reservation (Figure 2-3d). Topography on the 6,000 plus acre site is generally steep with typical elevations ranging from 1,000 m to 1,200 m above sea level.

According to NREL wind speed maps, high quality wind resources ranging from “Excellent 16.8 - 17.9 mph” to “Superb >19.7 mph” run the entire length of the site. . However, multi-year observations conducted by others suggest the site should more accurately be rated as “Good 15.7 – 16.8 mph.” The nearest transmission line is located approximately two to three miles east of the site across the Columbia River.

Numerous springs and small streams can be found on the site including a few scattered wetlands. Kittitas County wetland maps identify only one small wetland on the site just over ¼ acre in size. WDFW has identified nesting habitat for Swainson’s hawk, prairie falcon, and peregrine falcon at the west and central portion of the site and cliff habitat to the east.. Habitat for four sensitive plant species designated by DNR is located on the eastern portion of the site. WDFW has designated much of the south-facing drainages (approximately 7,000 acres) on the site as mule deer habitat, and the eastern portion (3,400 acres) as chuckar partridge habitat.

Fifty-six recorded archaeological sites are located within the boundaries of the Boylston Mountains site and 23 sites are located within a one-mile radius of the site.

The entire site is located within the boundaries of the Yakima Training Center, a federal military reservation administered by the U.S. Department of Defense and actively used for military training. Existing land cover is primarily shrublands interspersed with small areas of grasslands. The entire site is zoned Commercial Agriculture.

Figure 2-3d

Skookumchuck Creek

The Skookumchuck Creek site is located 6-1/2 miles north of I-90, west of the Columbia River (Figure 2-3e). The 6,000 plus-acre site is situated between the Quilomene Wildlife Area (on the north) and the Schaake Wildlife Area (on the south). Site topography is generally very hilly and steep with typical elevations ranging from 400 m to 800 m above sea level.

Wind resources across the site are considered “Good 15.7 – 16.8 mph” based on NREL wind speed maps. On-site observations conducted by others confirm the rating for the site. The closest transmission line is located approximately six miles east of the site across the Columbia River.

Skookumchuck Creek flows eastward through the center of the site. Numerous other streams are located on the site. Kittitas County wetland maps did not show wetlands to be present on the site. The site is known to support white-tailed jackrabbit and two sensitive plant species. WDFW has designated the entire site as mule deer, elk, and Rocky Mt. Bighorn sheep habitat (WDFW 2004).

No known archaeological sites were identified within the boundaries of the Skookumchuck site, although 15 known sites are located within a one-mile radius. The entire site is made up of one-square mile parcels and the existing land cover is mostly shrublands. The entire site is zoned Forest and Range.

Quilomene

The Quilomene site is located immediately north of I-90, approximately four miles northwest of the town of Vantage (Figure 2-3f). The 5,000-acre site is made up of seven or more one-square mile parcels, some contiguous, some not. Each parcel making up the site abuts an adjacent one-square mile parcel that is part of the Quilomene Wildlife recreation Area. The southernmost parcel abuts the Ginkgo State Park and Petrified Forest. Site topography is generally gently rolling with elevations ranging from 480 m to 520 m above sea level.

Wind resources for the site range from “Good 15.7 – 16.8 mph” to “Outstanding 17.9 - 19.7 mph” based on NREL wind speed maps. However, on-site observations conducted very near the site by others suggest a more accurate rating for the site would be “Good 15.7 – 16.8 mph.” One transmission line is located approximately nine miles northwest of the site and another is located approximately six miles east of the site across the Columbia River.

Two small tributaries to the Columbia River flow eastward through the site. Nationwide Wetland Inventory maps did not show wetlands to be present on the site. Shrub-steppe habitat has been identified as Priority Habitat, and habitat for the night snake, elk, and mule deer (WDFW 2004). Two sensitive plant species have been recorded in the western portion of the site.

Figure 2-3e

Figure 2-3f

Three recorded archaeological sites are located within the boundaries of the Quilomene and 17 sites are located within a one-mile radius. Existing land cover is shrublands and the site is zoned a combination of Commercial Agriculture and Forest and Range.

Off-site Alternatives Selection

All six sites were found to meet the minimum average wind criteria of 16 mph, however, none of the alternatives stood out as being superior to others based on wind data alone. Four of the sites (Springwood Ranch, Swauk Valley Ranch, Manastash Ridge and Boylston Mountains) had existing transmission lines either on site or within three miles of the site. Skookumchuck and Quilomene were furthest from existing lines at six and eight miles respectively.

All six sites are comprised of fairly large parcels. Four sites (Swauk Valley Ranch, Manastash Ridge, Boylston Mountains and Skookumchuck) are well over the desired size threshold of 6,000 acres. At 5,000 and 4,200 acres respectively, Quilomene and Springwood Ranch are both below the desired size threshold.

Most of the sites have the required zoning classifications of AG-20, Commercial AG and Forest and Range. The exception is Manastash Ridge that is zoned Commercial Forest and is therefore not suitable for operation of a wind farm. The Boylston Mountains site is also unsuitable because it is actively used for military training purposes—a use that is incompatible with operation of a wind farm.

All of the sites have varying degrees of environmental constraints including on-site springs, streams and wetlands. Springwood Ranch, Manastash Ridge and Skookumchuck all have large streams flowing across their sites that can complicate site design, especially placement of access roads and other major facilities. The northern portion of the Swauk Valley Ranch site is off limits to development because it is protected by a Nature Conservancy easement.

All sites also have varying amounts of designated Priority Habitats for anadromous fish and large mammals, and known nest sites for raptors and neotropical bird species (WDFW 2004). The Springwood Ranch site contains the most spawning and rearing habitat for anadromous fish, while the Manastash Ridge and Skookumchuck Creek sites support the diverse large mammal populations (elk, mule deer, black-tailed deer, bighorn sheep). Sensitive shrub-steppe plant communities occur at Quilomene, while four sensitive plant and plant communities are found at the eastern edge of the Swauk Valley Ranch site.

In addition, most sites have at least a few recorded archaeological sites within their boundaries. The Boylston Mountains have the greatest number at 56 recorded archaeological sites. The presence of archaeological sites can increase development costs by requiring expensive measures to avoid and possibly recover known or discovered cultural artifacts. Skookumchuck and Quilomene are both located immediately adjacent to wildlife areas that could be problematic for a wind farm operation. Quilomene also abuts Ginkgo State Park and Petrified Forest, both heavily used recreation areas.

Based on the screening criteria, it appears that only one site, Swauk Valley Ranch, stands out as a practical off-site alternative to the KVVWPP. The Springwood Ranch site, was also retained as

reasonable candidate for comparative off-site alternatives analysis, even though a wind resource developed on this site would have lower economic viability.

In addition to the Swauk Valley Ranch and Springwood Ranch sites, the Wild Horse Wind Power Project and Desert Claim Wind Power Projects that have been formally proposed for wind development, also meet the selection criteria for off-site alternatives listed above.

2.7.3 Reasonable Off-Site Alternatives Brought Forward for Impact Analysis

Swauk Valley Ranch

Although wind energy companies have investigated the prospects for wind energy development in the Swauk Valley Ranch area, there has been no specific proposal for a wind energy project on this site. The following project description is based on a conceptual layout prepared by Wind Ridge Power Partners LLC. The location of the site is presented in Figure 2-3a, and the layout is shown in Figure 2-4a. A conceptual layout of wind turbine and meteorological towers was prepared, but does not include access roads, power collection cables, a substation, operations and maintenance facility, or a transmission interconnection. These facilities would be required for a wind power project at this site, and their characteristics would likely be similar to those defined in Section 2.2 for the same components of the KVVPP.

Location and Site Characteristics

The Location and Site Characteristics of the Swauk Valley Ranch site are described in Section 2.5.2 above.

Wind Power Facilities

It is estimated that the Swauk Valley Ranch site could accommodate approximately 42 turbines, as shown in Figure 2-4a. A smaller or greater number of turbines could potentially be accommodated based on micro-siting. Using a 1.5 MW turbine, this number of turbines would generate approximately 63 MW of electric power, which is less than the capacity of the KVVPP under the Middle Scenario. This reduced scale raises questions whether this could be a commercially viable site; in any case, it is below the Applicant's objectives for a wind power facility (i.e., at least 158 MW) and less than the quantity of wind energy that is currently being sought by regional utilities (e.g., in September 2003, PSE issued a draft request for proposals to acquire approximately 150 MW of capacity from wind power (PSE, 2003)). Since Bonneville lines cross the middle portion of the site, connection to the power transmission grid could be accommodated.

Other project facilities and construction techniques would be the same as described for the proposed action. The project substation would be located on the property, while a switchyard would be located at the interconnect point. Project access roads would be similar in design to the proposed action, and are estimated to be 10 miles in length. Based on corresponding unit factors for the various project components, the total area permanently occupied by project facilities in

Figure 2-4 a

this case would be approximately 53 acres. The labor force required for construction and for long-term operation and maintenance of the 63-MW wind project on the Swauk Valley Ranch site would be less than for the proposed action, but the specific numbers or differences have not been estimated.

Springwood Ranch

Although wind energy companies have investigated the prospects for wind energy development in the Springwood Ranch area, there has been no specific proposal for a wind energy project on this site. The following project description is based on a conceptual layout for a wind power project on the Springwood Ranch site that was prepared by enXco, at Kittitas County's request, specifically for use in the Desert Claim EIS. The location of the site is presented in Figure 2-3b and the site layout is shown in Figure 2-4b. A conceptual layout of wind turbine and meteorological towers was presented in the Kittitas Valley Wind Power Project Draft EIS (ESFEC 2004), but did not include access roads, power collection cables, a substation, operations and maintenance facility, or a transmission interconnection. These facilities would be required for a wind power project at this site, and their characteristics would likely be similar to those defined in Section 2.2 for the same components of the KVVPP.

Location and Site Characteristics

The Location and Site Characteristics of the Springwood Ranch site are described in Section 2.5.2 above.

Wind Power Facilities

According to the Kittitas Valley Wind Power Project EIS (EFSEC, 2004), the Springwood Ranch site could accommodate approximately 40 to 45 turbines. A smaller or greater number of turbines could potentially be accommodated based on micro-siting. Using a 1.5 MW turbine, this number of turbines would generate approximately 64.5 MW of electric power, which is less than the capacity of the proposed action under the Middle Scenario. This reduced scale raises questions whether this could be a commercially viable site (PSE, 2003). Connection to transmission facilities (for the Bonneville lines) would require building a transmission line approximately 5 miles long, including crossing the Yakima River. Easements would also need to be acquired to travel across private properties located between the project site and the transmission line.

Other project facilities and construction techniques would be the same as described for the proposed action. The project substation would be located on the property, while a switchyard would be located at the interconnect point. Project access roads would be similar in design to the proposed action, but would be proportionally less in terms of total distance and disturbance. Based on corresponding unit factors for the various project components, the total area disturbed by construction activities for this alternative site would be approximately 125 acres. The total area permanently occupied by project facilities in this case would be approximately 30 acres. The labor force required for construction and for long-term operation and maintenance of a

Figure 2-4b

65-MW wind project on the Springwood Ranch site would be less than for the proposed action, but the specific numbers or differences have not been estimated.

Wild Horse Wind Power Project

Location and Site Characteristics

The Wild Horse Project is proposed on an approximately 5,000-acre site located about 10 miles east of the town of Kittitas, on the eastern slopes of Whiskey Dick Mountain. With the exception of Whiskey Dick Mountain, much of the site consists of a relatively flat plateau with steep-sided drainages. Several creeks originate on the project site (Whiskey Dick, Skookumchuck, and Whiskey Jim); several other creeks and their tributaries are located on or near the project site. The majority of the site consists of shrub-steppe habitat. No wetlands occur on the site, according to National Wetland Inventory (NWI) maps.

The proposed project area is zoned Forest and Range. It consists of open range land that is currently used for grazing. There are no residences on the project site, and none within 2 miles of any proposed turbine location. The area surrounding the Wild Horse site is sparsely populated. The proposed route for the transmission feeder line passes near a few residences.

The Wild Horse project area (as proposed by Wind Ridge Power Partners LLC) includes three parcels of State-owned land administered by DNR and totaling approximately 1,900 acres. Wind turbines and associated facilities would be developed on these lands, through a lease agreement with DNR.

Vehicle access to the site is via private road from Old Vantage Highway, at a point approximately 2 miles south of the project boundary and 10 miles east from Kittitas.

Wind Power Facilities

The proposed configuration of wind turbines on the Wild Horse site is shown in Figure 2-4c. The proposal would be comprised of between 83 to 125 wind turbines and associated facilities. The proposal would generate between 125 and 249 MW of power depending on the size of turbine ultimately chosen. Figure 2-4c presents a layout for a middle scenario of 1.5 MW nameplate capacity turbines. Facilities and construction techniques would generally be as described in Section 2.2 for the proposed action. The project would interconnect to either the existing Bonneville transmission line located approximately 4 miles west of the project site, or to the existing PSE transmission line located approximately 5 miles southwest of the project site. (If the interconnection were to the Bonneville system, the actual point of connection would be at the Schultz Substation farther to the northwest, although Bonneville would build and operate the new section of line that would run parallel to the existing Bonneville lines.)

The location of the project substation would depend upon the transmission system selected for interconnection, pursuant to an agreement with Bonneville or PSE. A location near the northwestern corner of the project site would be used for the substation if interconnection were to the Bonneville transmission system, while a substation location in the southwestern quadrant

Figure 2-4c

of the site would be used for a PSE interconnection. An operations and maintenance facility would be constructed near the center of the project area.

A network of graveled project access roads would be constructed to provide vehicle access to all of the turbine locations, as described for the proposed action. Minor or major improvements to existing primitive roads on the site would be implemented where possible, to minimize construction of new roads. Figure 2-4c shows the configuration of the project road system in relation to the turbines and other project facilities. Power collection cables (primarily underground) would generally follow the routes of the project access roads. Five permanent meteorological towers and a communications tower would be constructed at various locations on the project site.

Construction for the proposed Wild Horse project would occur over a 9-to-12 month period and is expected to be completed by the end of 2005. Gravel and other material needed for project construction (for roads, pads, etc.) would be obtained from three quarries developed on the site. Figure 2-9 shows the location of a temporary batch plant that would be built to provide concrete for the project. Five construction laydown areas would be developed for temporary use.

The total area occupied by the turbines and associated permanent facilities would be approximately 153 acres. The total area cleared/temporarily disturbed by construction activities would be approximately 309 acres. Once construction was completed, an estimated 10 to 14 local workers would be employed to operate and maintain the facility.

Desert Claim

The Desert Claim Wind Power Project (Desert Claim) is a proposed wind power project under review by Kittitas County. An application was submitted in January 2003 to Kittitas County Community Development Services by Desert Claim Wind Power LLC for permits to construct and operate the wind facility.

Location and Site Characteristics

The proposed Desert Claim project would consist of a 180 MW wind energy facility on 5,237 acres of privately-owned land (Figure 2-4d). The project area contains approximately 5,237 acres held by eight landowners. The southern edge of the project area is located approximately 8 miles north of the central part of Ellensburg. The project area extends approximately 5.5 miles from east to west and up to 5 miles in a north-to-south direction. The southwestern corner of the project area is over 1.5 miles east of U.S. Route 97 (see Figure 2-4d) and can be accessed from U.S. Route 97 via Smithson Road. Access to the project area from Ellensburg can be via Wilson Creek Road, Robbins Road, Pheasant Lane, Reecer Creek Road or Lower Green Canyon Road.

The project area is situated along the northern margin of the Kittitas Valley, which is the broad valley area of central Kittitas County on either side of the Yakima River between approximately Lookout Mountain and the Yakima Canyon. The terrain within the project area is relatively flat and open, with a gradual south-to-north rise in elevation totaling approximately 1,000 feet over a distance of approximately 5 miles. Surface elevations range from approximately 2,100 feet to

Figure 2-4d

2,500 feet above sea level across most of the project area. The northernmost portion of the project area lies within the foothills of the Wenatchee Mountains (a portion of the Cascade mountain range), which rise to the north of the Kittitas Valley. Several small, gently sloping creeks flow generally north to south across the project area, forming shallow depressions across the otherwise even landscape.

Approximately 53% of the site consists of shrub-steppe and 30% as grasslands. Remnant native shrub-steppe and grassland vegetation remain around the outer edges of the valley. The existing vegetative cover in most of the valley is dominated by agricultural cultivation and landscape plantings. Habitats range from poor to moderate quality for wildlife. Five perennial and 14 intermittent streams occur within the Desert Claim project area (Kittitas County 2003b).

There are no publicly-owned lands in the project area. The project area is in a rural, relatively lightly populated section of Kittitas County and is characterized primarily by cultivated feed crop production or pasture. There are extensive areas of rangeland used for grazing. Rural residential development occurs in a number of locations, including dwellings on farm or ranch properties, scattered residences on large lots, and a few small clusters of homes. A total of 31 occupied single-family residences (and 1 abandoned trailer) within the project area or within 1,000 feet of the project area boundary (Kittitas County, 2003).

Wind Power Facilities

The proposed Desert Claim project would occupy approximately 82 acres of land and support up to 120 turbines (Figure 2-4d). The specific facilities for the project include:

- a maximum of 120 wind turbines, each with a capacity of 1.5 MW and a total project generation capacity of 180 MW;
- free-standing tubular-steel towers up to 262 feet high and supporting three-bladed rotors (Total maximum height including blades of 393 feet);
- approximately 23 miles of roads;
- underground 34.5-kV electrical power lines;
- one substation;
- up to several miles of overhead 115- or 230-kV transmission line from the substation to the regional transmission system;
- one 5,000-square-foot operations and maintenance facility with parking, and
- up to four meteorological towers up to 164 feet in height.

Construction of the project would require nine months and 120 to 150 workers. The project would be operated and maintained during an assumed 30 years useful life. Operation and maintenance would include round-the-clock monitoring of output and performance and patrolling the project area to ensure security.