CHAPTER 1: SUMMARY

1.1 OVERVIEW

1.1.1 Introduction

Sagebrush Power Partners (the Applicant), a limited liability corporation (LLC), proposes to construct and operate a wind turbine electrical generation facility in Kittitas County, Washington (Figure 1-1). The Kittitas Valley Wind Power Project (KVWPP) would consist of up to 65 wind turbine generators with a total nameplate capacity of approximately 97 to 195 megawatts (MW). The project would be located on open ridgetops on each side of US 97 roughly halfway between Ellensburg and Cle Elum (Figure 1-2).

On January 13, 2003, the Applicant filed an Application for Site Certification (ASC No. 2003-01) with the Washington State Energy Facility Site Evaluation Council (EFSEC) in accordance with Washington Administrative Code (WAC) 463-42. The Applicant chose to receive certification of this KVWPP according to Revised Code of Washington (RCW) 80.50.060. EFSEC has jurisdiction over the evaluation and siting of certain major energy facilities in the state of Washington, including the proposed project, that have applied for site certification pursuant to WAC 463-42. As such, EFSEC will recommend approval or denial of the proposed wind facility to the governor of Washington after environmental review is completed.

With the submission of the ASC and in accordance with the Washington State Environmental Policy Act (SEPA), Chapter 43-21C RCW and WAC 463-47, EFSEC is evaluating the siting of the proposed project pursuant to the requirements of Chapter 80.50 RCW, and conducting an environmental review with this Environmental Impact Statement (EIS). The information and resulting analysis presented in this Final EIS are based primarily on information provided by the Applicant in the ASC No. 2003-01 (Sagebrush Power Partners LLC 2003a), and updated analyses prepared throughout the review process. Additional information used to evaluate the potential impacts has been referenced. EFSEC's environmental consultant, Shapiro and Associates, Inc., did not perform additional studies during the preparation of this EIS.

1.1.2 Summary of SEPA Review

Scoping

EFSEC began the SEPA review of this proposal by holding a scoping period. On March 12, 2003 EFSEC conducted agency and public scoping meetings in Ellensburg, Washington. Approximately 25 people attended the agency meeting and approximately 150 people attended the public scoping meeting. Written public comments were received until March 14, 2003. EFSEC's consultant prepared a scoping summary (Shapiro and Associates Inc. 2003), and considered these comments in the preparation of the Draft EIS.

Draft EIS

The Draft EIS for the KVWPP was issued on December 12, 2003. A public hearing to receive comments was held on January 13, 2004, in Ellensburg, Washington. The comment period for the Draft EIS closed on January 20, 2004.

During the comment period, EFSEC received comments from tribes, agencies, organizations, and individuals. Comments were submitted in letters, on comment cards, orally at the public hearing, and by email. Together, these are called "comment submissions" throughout this Final EIS. The comments and responses to the Draft EIS are presented in Volume 2, Section 3 of this Final EIS.

Draft Supplemental EIS

The Draft EIS analyzed reasonable offsite alternatives, which were coordinated between EFSEC and Kittitas County. However, to assist EFSEC in its decision-making process, an additional analysis of offsite alternatives was performed and documented in the Draft Supplemental EIS (EFSEC 2004b).

EFSEC staff prepared the Draft Supplemental EIS for the KVWPP, which was issued on August 11, 2004. A public hearing to receive comments was held on August 25, 2004, in Ellensburg, Washington. The comment period for the Draft Supplemental EIS closed on September 13, 2004. EFSEC accepted additional comment on the Draft Supplemental EIS on February 2, 2006. The comments and responses to the Draft Supplemental EIS are also presented in Volume 2, Section 4 of this Final EIS.

Addendum to Draft EIS

The applicant submitted a second Development Activities Application (DAA) to Kittitas County in August 2005, and on October 27, 2005, Kittitas County initiated its own review process (Sagebrush Power Partners LLC 2005). The Applicant presented various revisions to the project description and turbine layout in the October 2005 DAA. The Applicant proposed the revisions to address concerns raised by the County and by the public through the previous SEPA review steps held by EFSEC. The main changes to the project included:

- Reducing the number of turbines to a maximum of 80 units;
- Committing to not install the smaller turbines, and instead using turbines with a net power output ranging between 1.5 and 3 megawatts (MW);
- Revising the turbine string layout to mitigate visual, shadow flicker and noise impacts; and
- Increasing the setback from property lines of neighboring landowners without project agreements from 50 feet to 541 feet beyond the tip of the blade at its closest point to the property line.

EFSEC staff reviewed the DAA to determine whether additional information would be required to ensure a complete review under SEPA. EFSEC's SEPA official determined that an Addendum to the draft EIS should be issued according to WAC 197-11-625. The purpose of the Addendum was to update the project description, and to document the results of the analysis performed to:

- Confirm that impacts resulting from the revisions to the turbine layout were already analyzed and documented in the Draft EIS or Draft Supplemental EIS;
- If the impacts were not analyzed, present new information about the impacts that was submitted by the Applicant to EFSEC in support of the revised KVWPP layout;
- Evaluate whether the changes to the KVWPP layout would have a probable significant adverse environmental impact on any element of the environment that could not be mitigated;
- Determine whether the significance of any identified unavoidable adverse impacts had changed from the assessment made in the Draft EIS or Draft Supplemental EIS.

The Addendum was prepared by EFSEC staff, based on review of the documents regarding the revised KVWPP layout submitted by the Applicant to Kittitas County, and further supplemented by additional reports on visual, noise and shadow flicker impacts (see Section 1.1.5, Other Updated Environmental Information Since Draft EIS Publication). The Addendum was issued on December 23, 2005 (EFSEC 2005d).

Final EIS

During the review of the DAA by Kittitas County, and during the adjudicative hearings held by EFSEC (see Section 1.1.3, Summary of Other EFSEC Review, below), the Applicant made additional commitments to mitigate the impacts of the KVWPP. In particular, the Applicant further reduced the number of turbines to a maximum of 65 units, and committed to shutting turbines down during periods when they might cause shadow flicker impacts to residences of non-participating landowners. With these changes, the project description for the KVWPP, and the description for the proposed action in this EIS were finalized (see Chapter 2, Proposed Action and Alternatives). This EIS therefore assesses the impacts of a 65-turbine wind power project, with a total net generating capacity of approximately 97 to 195 MW. The Final EIS was prepared by Shapiro and Associates, and EFSEC staff.

1.1.3 Summary of Other EFSEC Review

In addition to the environmental review performed under SEPA, EFSEC has also received information about the impacts of the proposed action through the processes described below.

Adjudicative Hearings

EFSEC's statute chapter, 80.50 RCW, requires that an adjudicative hearing be conducted according to the requirements of the Administrative Procedure Act Chapter, 34.05 RCW. EFSEC conducted the adjudicative proceeding as follows:

- In May 2003, EFSEC issued a notice of Adjudication and Opportunity to File Petitions for Intervention;
- In July 2003, EFSEC granted party status to the following agencies and organizations: the Applicant; the Counsel for the Environment; the Washington State Department of Community, Trade and Economic Development; Kittitas County; the Economic

Development Group of Kittitas County; Sierra Club; Residents opposed to Kittitas Turbines (ROKT); Chris Hall; and F. Steven Lathrop;
- From June 2003 through August 2006, EFSEC conducted a number of procedural pre-hearing conferences;
- In September 2006, EFSEC conducted the Adjudicative Hearing, in Ellensburg, Washington;
- In September 2006, as part of the Adjudicative Hearing, EFSEC held two public testimony sessions;
- From October through November 2006, the parties to the proceeding filed post-hearing briefs.

Land Use Consistency Review and Applicant's Requests for Preemption

EFSEC rules require that a determination be made whether the project as proposed is consistent with local land use plans and zoning regulations.

- In May 2003, EFSEC conducted a land use hearing to receive testimony from the Applicant, Kittitas County, and the public on the consistency of the KVWPP with local land use plans and zoning regulations;
- In May 2003, EFSEC determined that the project was not consistent with local land use plans and zoning regulations;
- From May 2003 through February 2004, the Applicant and Kittitas County attempted to resolve the land use inconsistency; the applicant submitted a first Development Activities Application (DAA) to Kittitas County and the County began review of this DAA during this period;
- In February 2004, the Applicant submitted a request for preemption to EFSEC;
- In July 2005, the Applicant withdrew its first request for preemption;
- In September 2005, the Applicant submitted a second DAA to Kittitas County;
- Kittitas County denied the DAA in June 2006;
- The Applicant submitted a second request for preemption in June 2006.

Recommendation to the Governor

At the conclusion of the EFSEC review described above, and after a Final EIS has been issued, EFSEC is required to make a recommendation to the Governor as to whether the construction and operation of the KVWPP should be authorized, and whether the state should preempt local land use and zoning requirements.

1.1.4 Project Changes and Updated Environmental Information Since Draft EIS Publication

As noted above, the Applicant made additional mitigation commitments during the review of their second DAA submitted to Kittitas County, and during the EFSEC Adjudicative hearings. Table 1-1 compares the main changes to the originally proposed KVWPP described in the Draft EIS, to the proposal being now considered for action by EFSEC, and presented in this EIS. The

Applicant has now limited the number of turbines proposed to a maximum of 65, with tip height not to exceed 410 feet.

As a result of the changes, the Final EIS includes updates to analyses that were presented in the Draft EIS, as summarized below:

- The Applicant has provided revised noise, shadow flicker, and visual assessments for the 65-turbine project layout;
- Information on wildlife, including avian species, health and safety hazards, and the project's effect on property values has been refined based on testimony presented to EFSEC through the adjudicative proceedings held pursuant to Washington State statute, through comments received on the Draft EIS and Draft Supplemental EIS, and through coordination with applicable agencies;
- The requirements for wetland mitigation and the 401 water quality certification have been determined through further consultation with the U.S. Army Corps of Engineers and Washington Department of Ecology;
- Impacts on historic cultural resources have been addressed through further consultation with the State Office of Archaeology and Historic Preservation and preparation of a report entitled *Cultural Landscapes Investigation and Impacts to Historical Inventory for the Kittitas Valley Wind Power Project* (Trautman 2004);
- The Applicant has provided additional information on radio interference.

1.2 PURPOSE AND NEED FOR PROJECT

The purpose of the KVWPP is to construct and operate a new electrical generation resource using wind energy that will meet a portion of the projected growing regional demand for electricity produced from nonrenewable and renewable resources. In the Pacific Northwest Electric Power Planning and Conservation Act, Congress established that development of renewable resources should be encouraged in the Pacific Northwest (16 United States Code [USC] Section 839[1][B]). The Act defines wind power as a renewable resource (Section 839a[16]).

The project has a transmission and interconnection request under review with the Bonneville Power Administration (Bonneville) and Puget Sound Energy (PSE). The Applicant is in the process of marketing the electricity that would be produced by the KVWPP to local and regional utilities and power markets.

Table 1-1: Comparison of KVWPP as Described in the Draft and Final EIS

	Project as Described in Draft EIS[1]			Project Described in Final EIS[2]	
	Upper End Scenario: 150 Turbines/ 1.3 MW	**Middle Scenario: 121 Turbines/ 1.5 MW**	**Lower End Scenario: 82 Turbines/ 3 MW**	**330-foot Turbine Scenario: 65 Turbines/ 1.5 MW**	**410-foot Turbine Scenario: 65 Turbines/3 MW**
Project Design Features					
Number of turbines	150	121	82	65	65
Rated output of turbine	1.3 MW	1.5 MW	3 MW	1.5 MW	3 MW
Axis	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Rotor orientation	Upwind	Upwind	Upwind	Upwind	Upwind
Minimum wind speed for turbines to begin operating	7-10 miles per hour[3]	7-10 miles per hour[3]	7-10 miles per hour[3]	7-10 miles per hour[3]	7-10 miles per hour[3]
Number of blades	Three	Three	Three	Three	Three
Rotor (blade) diameter	197 feet	231 feet	295 feet	231 feet	295 feet
Tower type	Tubular steel	Tubular steel	Tubular steel	Tubular steel	Tubular steel
Tower hub (nacelle) height	150 feet	215 feet	262 feet	215 feet	263 feet
Total (tip) height (to top of vertical rotor)	260 feet	330 feet	410 feet	330 feet	410 feet
Rotational speed	10-23 rotations per minute	10-23 rotations per minute	10-23 rotations per minute	10-23 rotations per minute	17-20 rotations per minute
Nacelle	Fully enclosed steel or steel reinforced fiberglass	Fully enclosed steel or steel reinforced fiberglass	Fully enclosed steel or steel reinforced fiberglass	Fully enclosed steel or steel reinforced fiberglass	Fully enclosed steel or steel reinforced fiberglass
Color	Neutral gray	Neutral gray	Neutral gray	Neutral gray	Neutral gray

Sources: Sagebrush Power Partners LLC 2003a; Sagebrush Power Partners LLC 2005b; Potter 2006; Brown 2006; Sagebrush Power Partners LLC 2006b

1 For purposes of this comparison Draft EIS includes the Draft EIS, and the Supplemental Draft EIS.

2 For purposes of this comparison includes the project as described in the Addendum to the Draft EIS and additional commitments made to Kittitas County and EFSEC in 2006.

3 Wind turbines rotate in winds as low as 2-3 mph, but generator cut in occurs at 7-10 mph.

4 Totals may not add up due to rounding.

5 Project Site Roadways: Project in Draft EIS: Existing: 7 miles New: 19 miles; Project in Final EIS: Existing: 8 miles New: 13 miles.

6 Number of permanent meteorological towers: Project in Draft EIS: up to 9; Project in Final EIS: up to 5.

Table 1-1 continued: Comparison of KVWPP as Described in the Draft and Final EIS

	Project as Described in Draft EIS[1]			Project Described in Final EIS[2]	
	Upper End Scenario: 150 Turbines/ 1.3 MW	**Middle Scenario: 121 Turbines/ 1.5 MW**	**Lower End Scenario: 82 Turbines/ 3 MW**	**330-foot Turbine Scenario: 65 Turbines/ 1.5 MW**	**410-foot Turbine Scenario: 65 Turbines/3 MW**
Acres of Temporary Disturbance Footprint					
Disturbance beside roads	41	41	41	49.4	49.4
Laydown area at turbines	309.9	250	169.4	134.3	134.3
Material laydown area at substation	5	5	5	5	5
Meteorological tower temporary footprint	3.7	3.7	3.7	3.7	3.7
Temporary overhead line pole footprint	8.8	8.8	8.8	8.8	8.8
Temporary area at O&M facility	3	3	3	10	10
Total Temporary Footprint (acres)[4]	371	311	231	211.2	211.2
Acres of Permanent Disturbance Footprint					
Project site roadways[5]	95	67	67	82.6	82.6
Turbines and crane pads	5.4	8	9.9	4.4	4.4
O&M facility with parking	2	2	2	5	5
Overhead line pole footprint (50 poles)	0.25	0.25	0.25	0.25	0.25
Step up substation (up to 2)	6	6	6	6	6
Turn-around areas (up to 18)	9	9	9	9	9
Meteorological towers[6]	0.75	0.75	0.75	0.42[6]	0.42[6]
Total Permanent Footprint (acres)[4]	118	93	95	108	108

Sources: Sagebrush Power Partners LLC 2003a; Sagebrush Power Partners LLC 2005b; Potter 2006; Brown 2006; Sagebrush Power Partners LLC 2006b

1 For purposes of this comparison Draft EIS includes the Draft EIS, and the Supplemental Draft EIS.

2 For purposes of this comparison includes the project as described in the Addendum to the Draft EIS and additional commitments made to Kittitas County and EFSEC in 2006.

3 Wind turbines rotate in winds as low as 2-3 mph, but generator cut in occurs at 7-10 mph.

4 Totals may not add up due to rounding.

5 Project Site Roadways: Project in Draft EIS: Existing: 7 miles New: 19 miles; Project in Final EIS: Existing: 8 miles New: 13 miles.

6 Number of permanent meteorological towers: Project in Draft EIS: up to 9; Project in Final EIS: up to 5.

1.2.1 Need for Additional Power Generation Facilities

Recent national and regional forecasts predict increasing consumption of electrical energy will continue into the foreseeable future, requiring development of new generation resources to satisfy the increasing demand. The Energy Information Administration (EIA) published a national forecast of electrical power through the year 2025. In it, the EIA projected that total electricity demand would grow between 1.8% and 1.9% per year from 2001 through 2025. Rapid growth in electricity use for computers, office equipment, and a variety of electrical appliances in the residential and commercial sectors is only partially offset by improved efficiency in these electrical applications (U.S. Energy Information Administration 2003).

The Western Electricity Coordinating Council (WECC) forecasts electricity demand in the western United States. According to WECC's most recent coordination plan, the 2001-2011 summer peak demand requirement is predicted to increase at a compound rate of 2.5% per year (WECC 2002).

Based on data published by the Northwest Power and Conservation Council (NWPCC), electricity demand for the NWPCC's four-state Pacific Northwest planning region (Washington, Oregon, Idaho, and Montana) was 20,080 average MW in 2000 (NWPCC 2003).

As shown in Table 1-2, the NWPCC's recently revised 20-year demand forecast projects that electricity demand in the region will grow from 20,080 average MW in 2000 to 25,423 average MW by 2025 (medium forecast), an average annual growth rate of just less than 1% per year. While the NWPCC's forecast indicates that the most likely range of demand growth (between the medium-low and medium-high forecasts) is between 0.4% and 1.50% per year, the low to high forecast range used by the NWPCC recognizes that growth as low as -0.5% per year or as high as 2.4% per year is possible, although relatively unlikely (NWPCC 2003).

Table 1-2: Projected Pacific Northwest Electricity Demand, 2000-2025

Forecast Scenario	Electricity Demand (Average Megawatts)			Growth Rates (% Change)	
	2000	2015	2025	2000-2015	2000-2025
Low	20,080	17,489	17,822	-0.92	-0.48
Medium Low	20,080	19,942	21,934	-0.05	0.35
Medium	20,080	22,105	25,423	0.64	0.95
Medium High	20,080	24,200	29,138	1.25	1.50
High	20,080	27,687	35,897	2.16	2.35

Source: NWPCC 2003

Generated power typically requires interconnection with a high-voltage electrical transmission system for delivery to purchasing retail utilities. The Applicant has submitted requests for transmission interconnection services for the project to both PSE and Bonneville (Bonneville 2003). If connected to PSE's system, the project would interconnect directly with PSE's Rocky Reach to White River 230-kV line. 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.

1.2.2 Wind Power Project Purpose and Need

There is a growing market for electricity powered by renewable energy ("green resources") in the Pacific Northwest. RCW 19.29A, "Implementation of Retail Option to Purchase Qualified Alternative Power," signed into law in 2001, directed sixteen of Washington's electric utilities to offer a voluntary "qualified alternative energy product" (essentially an electricity product powered by green resources) starting by January 2002. The law defined a "qualified alternative energy resource" as electricity fueled by wind, solar energy, geothermal energy, landfill gas, wave or tidal action, gas produced during the treatment of wastewater, qualified hydroelectric power, or biomass. A survey of participating utilities in October 2002 found that each of the sixteen utilities has a green power electricity product to offer its customers and that wind power represented the vast majority of the green power sales in the program during 2002 (approximately 90%) (CTED and WUTC 2002). (See Section 3.5, Energy and Natural Resources, for a detailed discussion of this program.) The results of this survey demonstrate that local and regional markets for green power have been increasing.

Many regional utilities are seeking to acquire new generating resources to meet their loads. More specifically, several regional utilities, including Avista, PSE, 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 Plans or Least Cost Plans with oversight from the Washington Utilities and Transportation Commission (WUTC). As a result, PSE, PacifiCorp, and Avista have issued requests for proposals specifically for wind power or other renewable resources. Avista is seeking to acquire 50 MW; PSE is seeking to acquire a minimum of 150 MW, and PacifiCorp is seeking to acquire 1,100 MW (see Section 3.5.1 for more information on these utilities). Thus, the regional demand for wind-generated energy exceeds the existing regional supply.

In summary, electrical consumers served by the Northwest Power Pool and in other western states need increased power production to serve the predicted long-term increasing demand and high-voltage transmission lines to deliver the power, and it appears that this demand will increasingly be met by production of renewable resources. The proposed KVWPP would help meet this growing regional demand for renewable, wind-generated electricity.

1.3 DECISIONS TO BE MADE

This document is a SEPA Final EIS intended to meet the environmental review needs of EFSEC. EFSEC has jurisdiction over all of the evaluation and licensing steps for siting certain major energy facilities in the state of Washington that have applied for site certification pursuant to WAC 463-42. EFSEC is the sole non-federal agency authorized to permit the proposed project. For informational purposes, Table 1-3 lists the major state and local permitting requirements preempted by EFSEC, as well as federal requirements. Not all listed permits and approvals may be required.

After issuing the Final EIS EFSEC will make a recommendation to the governor of Washington to approve or deny the proposed project. If EFSEC makes a recommendation that the project be approved, EFSEC would specify the conditions of construction and operation in a proposed Site

Certification Agreement (SCA). If the Governor approves the project, EFSEC would issue the SCA instead of any individual state or local permitting authority, and manage the environmental and safety oversight program of project operations. EFSEC's SCA acts as an umbrella authorization that incorporates the requirements of all state and local laws and regulations.

EFSEC has determined pursuant to WAC 463-28-030 that the KVWPP is not consistent with Kittitas County land use plans and zoning ordinances (EFSEC 2003). The Applicant submitted a second request for preemption in June 2006 (Sagebrush Power Partners LLC 2006a). EFSEC will make a recommendation to the governor of Washington whether the state should preempt local land use plans and zoning ordinances for this proposal.

1.4 DESCRIPTION OF ALTERNATIVES

Six alternatives were evaluated in the Draft and Draft Supplemental EIS, the proposed action (constructing and operating the KVWPP and associated components), four offsite alternative locations (Swauk Valley Ranch, Springwood Ranch, Wild Horse, and Desert Claim), and the No Action Alternative (not constructing and operating the proposed action). Three turbine size scenarios were considered as part of the proposed action. Alternatives considered by the Applicant and eliminated from further study are also described.

Offsite alternative locations

As a result of the changes to the project brought forward by the Applicant in the final stages of review, the alternatives discussed in the Draft EIS, Draft Supplemental EIS, and Addendum to the Draft EIS have been revised as described below.

The Governor of Washington State approved the construction and operation of the Wild Horse Wind Power Project in July 2005 (EFSEC 2005b). Construction of the project began in October 2005, and commercial operation is expected to begin in December 2006 (Diaz 2006). The Wild Horse site it therefore no longer an alternative location available to the Applicant.

In April 2005 Kittitas County denied the Development Activities Application (DAA) for the Desert Claim Project, which was under review by Kittitas County at the time the KVWPP Draft EIS and Draft Supplemental EIS were issued (BOCC 2005). In November 2006, Desert Claim Wind Power LLC submitted an Application for Site Certification to EFSEC (Desert Claim Wind Power LLC 2006). As a result, the location of the Desert Claim Wind Power Project is also no longer a possible alternative location.

Therefore the Swauk Valley Ranch and the Springwood Ranch locations are the remaining locations that are considered in this EIS.

No Action Alternative

The No Action Alternative continues to be included in this Final EIS.

Project Scenarios

The Applicant chose to ultimately reduce the number of turbines proposed to no more than 65, with a tip height not to exceed 410 feet. The Applicant has also dropped from consideration the smaller sized turbines described in the Draft EIS under the "Upper End Scenario". In addition, since the time the environmental analysis was originally started for this project, the nominal capacity of wind turbines currently on the market no longer directly correlates with their physical dimensions (Taylor 2006). Therefore, to capture a "reasonable range" of potential project impacts, this EIS defines and evaluates the following proposed action scenarios:

- 330-foot Turbine Scenario: This scenario represents the project configuration that would be chosen based on pricing and performance for wind turbine technology currently on the market. Up to 65 turbines would be constructed. This scenario is best represented by turbines with a nameplate capacity of approximately 1.5 to 2 MW, resulting in an approximate total nameplate capacity of 97.5 MW;
- 410-foot Turbine Scenario: This scenario represents the project configuration with the largest dimension of proposed turbines, not to exceed a tip height of 410 feet. With an approximate nameplate capacity of 3 MW each, and with up to 65 turbines constructed, the project would have a total approximate nameplate capacity of 195 MW.

1.4.1 Proposed Action

The proposed action would construct and operate up to 65 wind turbine generators with a total nameplate capacity of approximately 97.5 to 195 MW and associated components in Kittitas County, Washington (Figure 1-1). The proposed project would occupy approximately 108 acres of land and would be located on open ridgetops on each side of US 97 in Kittitas County, roughly halfway between Ellensburg and Cle Elum (Figure 1-2).

The final selection of the exact type and size of wind turbine to be used for the project depends 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 depend on the make and model of turbine used. Therefore, to capture a "reasonable range" of potential project impacts, this EIS defines and evaluates the two scenarios described above: 330-foot Turbine Scenario, and 410-foot Turbine Scenario.

The facilities, equipment, and features to be installed as part of the project include:

- approximately 13 miles of new roads, and improvements to roughly 8 miles of existing roads;
- approximately 23 miles of underground 34.5-kV electrical power lines;
- approximately 2 miles of overhead 34.5-kV electrical power lines;
- two substations;
- one 5,000-square-foot operations and maintenance facility with parking; and
- up to five permanent meteorological towers.

The KVWPP would be constructed across a land area of approximately 6,000 acres in Kittitas County, although the actual permanent facility footprint would be approximately 108 acres. The

majority of the KVWPP site and the proposed interconnect points lie on privately owned lands and there are five parcels owned by the Washington State Department of Natural Resources (DNR). The Applicant has obtained wind option agreements with landowners for all private lands within the project site boundary necessary for project installation. In June 2003, the Applicant executed a lease agreement for use of DNR property in the project area.

1.4.2 Alternatives Considered but Rejected

Alternative Wind Energy Technologies

Several types of wind energy conversion technologies have been pursued over the past 30 years:

- Vertical Axis Darrieus Wind Turbines;
- Two-Bladed Downwind Wind Turbines;
- Smaller Three-Bladed Upwind Wind Turbines (500 to 750 kilowatts [kW]);
- Larger Three-Bladed Upwind Wind Turbines (1.3 to 2.5 MW).

The technology that has demonstrated itself as the most reliable and commercially viable is the three-bladed, upwind, horizontal axis. The proposed action contemplates the use of larger megawatt-class wind turbines (i.e., 1.5 to 2.5 MW). Compared to the other three technologies identified, this type of turbine requires fewer machines, covers a smaller overall project footprint, and is anticipated to have fewer avian impacts because of a smaller rotor swept area and fewer rotations per minute. The reasons for rejecting other wind energy technologies from further consideration are described in more detail in Chapter 2.

Alternative Wind Turbine Locations

The siting of wind turbines is constrained by the need for a location with a sufficient wind resource to allow the project to operate in a commercially and technically viable manner. The Applicant's proposal for the KVWPP identified and presented only the proposed project area for development. Both the Applicant and other wind project developers have considered other possible project site locations, but such locations were rejected because of a lack of sufficient wind resource (leading to a price for the project's output that is higher than the market price, thus rendering the project economically infeasible) or remoteness from nearby transmission lines (which would require constructing a lengthy transmission line to interconnect with the power grid). However, other alternative sites to the Applicant's proposal are considered in this Final EIS, as described in Section 1.4.3.

An alternative layout of individual turbines and turbine strings in the project area (referred to as Alternative A) was evaluated during the early stages of project development and was subsequently refined to reduce potential impacts; the resulting layout defines the proposed action. Alternative A was rejected for further consideration in this EIS because of its higher environmental costs. The specific reasons for rejecting Alternative A are described in more detail in Chapter 2.

Figure 1-1

Figure 1-2

Table 1-3: Pertinent Regulations, Statutes, and Ordinances

Permit, Approval, or Review	Agency with Jurisdiction[1]	Evaluation/Issue	Statute or Regulation
Federal			
Endangered Species Act	NOAA Fisheries, U.S. Fish & Wildlife Service	Endangered Species Protection/Compliance; Habitat Conservation Plan	ESA 7; ESA10; 16 USC 1531 et seq.; 50 CFR 402
Clean Water Act, Section 404 (Nationwide Permit)	U.S. Army Corps of Engineers	Wetlands	33 USC 1344, Section 404; 40 CFR 231 (Authority), 233 (State); 33 CFR 320-330
National Pollutant Discharge Elimination System Permit	U.S. EPA, Clean Water Act (by Washington Department of Ecology)	Stormwater and Industrial Discharges	40 CFR 122; also see #13-15 under Washington State
Notice of Proposed Construction or Alteration	Federal Aviation Administration	Aviation Regulations and Lighting	14 CFR Part 77; FAA Advisory Circular 70/7460-1 AC70/7460-1K; FAA Advisory Circular No, 70/460-2H
Oil Pollution Prevention and SPCC Plan	WA Department of Ecology	Discharge of soil to waters of the U.S.	Clean Water Act, 33 USC 1251; 40 CFR 112
National Historic Preservation Act	WA Office of Archaeology and Historic Preservation	Historic and Cultural Preservation/Compliance	NHPA 106; 16 USC 470 et seq.; 36 CFR 60-63, 800; et al. Chapter 27.53 RCW
Washington State			
State Environmental Policy Act	EFSEC	Environmental Review/Compliance	WAC 197-11, WAC 463-47; RCW 43.21C.
Stormwater Construction Discharge Permit	WA Department of Ecology	Water Quality	40 CFR 122, 123, and 124, subchapter D; RCW 80.50 and 90.48; et al.
Transportation and Highway Access	WA Department of Transportation	Access from State Highway	Washington Highway Access Management, RCW 47.50; WAC Chapter 468-51 and 468-52
Clean Water Act, Water Quality Certification	WA Department of Ecology	Water Quality	Federal Clean Water Act, Section 401; WAC 173-225
Groundwater Regulations	WA Department of Ecology	Construction and Maintenance of Groundwater Wells	Chapter 90.54 RCW; Chapter 18.104 RCW; Chapter 43.12 RCW; and WAC Chapters 173-160, 173-162
Fish and Wildlife Regulations/HPA Permit (Issued in Conjunction with Corps Nationwide Permit through Joint Aquatic Resources Permit Application)	WA Department of Fish and Wildlife	Classification of Wildlife Species and Construction In or Near State Waters	WAC Chapter 232-12; RCW 75.20.100-160
Electrical Construction Permit	WA Department of Labor and Industries	Installing Electrical Wires and Equipment	WAC Chapter 296-746A
Noise Regulations	Kittitas County (per State standards)	Noise Control and Abatement	RCW 70.107; WAC Chapters 173-58 and 173-60
Kittitas County			
Building Permit	Building Office	Facility Construction	WAC Chapter 51-40; RCW 19.27; Kittitas County Code 14.04
Critical Areas Review/Determination	Planning Office	Resources Protection	Kittitas County Municipal Code, Title 17A (Critical Areas Ordinance)
Kittitas County Comprehensive Plan	Planning Office	Site-Specific Amendment of Comprehensive Plan Land Use Designation Map to Wind Farm Resource Overlay District; may not be applicable pending resolution of Applicant's request to EFSEC for preemption from local land use plans and zoning ordinances.	Kittitas County Municipal Code, Title 15B.03
Zoning Ordinance	Planning Office	Re-Zone Project Site as Wind Farm Resource Overlay District; may not be applicable pending resolution of Applicant's request to EFSEC for preemption from local land use plans and zoning ordinances.	Kittitas County Municipal Code, Title 17.98
Uniform Standards for Installation of Buried Cables	Public Works Department	Culvert and Cable Installation	Kittitas County Municipal Code, Title 12.16
Stormwater Management Standards and Guidelines	Public Works Department	Stormwater Management	Kittitas County Code Title 12.70
Sewage Disposal Installation and Design and Septic Tank Cleaning Regulations	Environmental Health Department	Installation and Maintenance of Septic System	Kittitas County Code Title 13.04
County Road Franchise	Public Works Department	Underground Transmission Line	Kittitas County Code Title 12.56
Noxious Weeds	Noxious Weed Control Board	Control of Weeds	RCW 17-10

[1]EFSEC has single permit authority over all Washington State and local permits.

1.4.3 Offsite Alternatives

Consideration was given to other possible sites available for wind power generation within Kittitas County. The analysis of these other potential sites is being provided in this EIS in response to scoping and Draft EIS comments suggesting the viability of other sites for wind power project development. Consistent with the SEPA rules, specifically WAC 197-11-440(5), EFSEC conducted an independent evaluation (EFSEC 2004a) for offsite alternative locations within Kittitas County. At that time, the Applicant was still attempting to resolve the land-use inconsistency with Kittitas County, and a rezone action by the County was a possible outcome. The off-site alternatives analysis was performed to assist the County in meeting its environmental review obligations. As documented in the August 2004 Draft Supplemental EIS for the KVWPP, the offsite alternatives analysis was conducted at a "non-project" level, consistent with WAC 197-11-442, sufficient to evaluate their comparative merits.

With the second request for preemption being submitted by the Applicant to EFSEC in August 2006, a rezone of the Project Area by the County was no longer a possible outcome, and the future final action on the project fell to the Governor of Washington State. Therefore, the inclusion of an off-site alternatives analysis was no longer formally required by WAC 197-11-440(5). Nevertheless, the off-site alternatives analysis was retained for informative purposes. The two offsite alternatives evaluated in this Final EIS are the Swauk Valley Ranch site and the Springwood Ranch site. The affected environment and impact analysis for these offsite alternatives are incorporated into this Final EIS under each element of the environment. Detailed discussion of the screening and selection process of the offsite alternatives to be carried forward in this EIS is presented in Chapter 2. Table 1-5 presents a summary of impacts and mitigation for the two offsite alternatives considered in this EIS.

As described in Section 2.6, Consideration of Offsite Alternatives, analysis of the Wild Horse Wind Power Project, and Desert Claim Wind Power Project have not been included in this EIS. The Energy Facility Site Evaluation Council has, however, considered the environmental impacts of these two projects through other finalized and on-going permitting actions (EFSEC 2004b, 2005a; Kittitas County 2004; Desert claim Wind Power Project LLC 2006).

1.4.4 No Action Alternative

Under the No Action Alternative, the proposed KVWPP would not be built, and the environmental impacts described in this EIS would not occur. However, development by others, and of a different nature, including residential development, could occur at the project site in accordance with the County's existing Comprehensive Plan and zoning regulations.

If the proposed project were not constructed, power providers would continue to use other or new power sources to meet the needs of their customers. It is likely that the region's need for power would be addressed by a combination of energy efficiency and conservation measures at the user's end, existing power generation sources, or by the development of new renewable and nonrenewable generation sources. Baseload demand would likely be filled through expansion of existing, or development of new, thermal generation sources, such as gas-fired combustion

turbine technology. Such development could occur at appropriate locations throughout the state of Washington.

A baseload natural gas-fired combustion turbine would have to generate 60 average MW to replace an equivalent amount of power generated by the project. (An "average MW" is the average amount of energy supplied over a specified period of time, in contrast to "MW," which indicates the maximum or peak output [capacity] that can be supplied for a short period.) Although it would be speculative to estimate impacts of a similarly sized combustion turbine because of uncertainty about the location and type of technology, impacts from a typical combustion turbine include: site specific construction and operation impacts in the vicinity of the new plant; short and long range air emissions; impacts associated with natural gas extraction and transport; impacts associated with transmission of the generated power; impacts associated with withdrawal of large quantities of water used for cooling and discharge of wastewater; noise impacts; and associated impacts on fish, plant, and wildlife resources.

1.5 SUMMARY OF PUBLIC INVOLVEMENT, CONSULTATION, AND COORDINATION

In addition to the SEPA and other review processes conducted by EFSEC (see Sections 1.1.2 and 1.1.3 above), the Applicant has been communicating and meeting with local, state, and federal agencies, Indian tribes, the public, and nongovernmental organizations throughout development of the proposed project.

EFSEC has also contracted with the Washington Department of Fish and Wildlife (WDFW) and the Department of Ecology (Ecology) to review and provide input regarding the Applicant's proposal. The WDFW was consulted to identify agency issues and concerns regarding potential project impacts on vegetation, wetlands, wildlife, fisheries, and threatened and endangered species with the potential to occur in the project area, as well as to solicit guidance on project mitigation measures. Ecology was consulted to solicit their input regarding potential project impacts on wetlands, water resources and water quality, and air quality.

Both the Applicant and EFSEC have coordinated with Kittitas County throughout the Application and EIS development phases of the project. The Applicant submitted draft land use application materials for the proposed action to the Kittitas County Community Development Services Department for administrative review in March, May, and June of 2003. The Applicant submitted a Second Development Activities Application to Kittitas County in September 2005.

Both the Applicant and EFSEC have informed the Yakama Nation about the project. To date, the Tribe has indicated it has concerns about the cumulative effects of wind turbine projects on the lands and resources of the Yakama Nation. Prior to Draft EIS publication, the Yakama Nation had been offered opportunities for meetings and site visits to discuss the project but declined to participate. However, in January 2004 the Yakama Nation requested a meeting with EFSEC and the Applicant to discuss and plan for the cumulative effect of wind power on a regional basis. Consultation with the Yakama Nation is ongoing.

Project documents are available to the public on the EFSEC Web site and in local libraries.

1.6 DOCUMENT ORGANIZATION

This Final EIS analyzes the KVWPP (the proposed action), two offsite alternatives, and a No Action Alternative. The document is organized as follows:

Volume 1:

- Chapter 1 summarizes this Final EIS for the KVWPP. This section briefly describes the alternatives evaluated in the environmental analysis and includes a matrix summarizing anticipated impacts and mitigation measures of the proposed action, the No Action Alternative, and two offsite alternatives;
- Chapter 2 presents a description of the alternatives analyzed in this document;
- Chapter 3 conducts an environmental analysis of the affected environment, impacts, mitigation measures, and significant unavoidable adverse impacts related to the alternatives for 13 elements of the environment. Cumulative impacts are also addressed in Chapter 3.

Volume 2:

- Chapter 1 summarizes the contents of Volume 2 of the Final EIS;
- Chapter 2 presents responses to key issues;
- Chapter 3 presents the comments to the Draft EIS, and the responses to those comments;
- Chapter 4 presents the comments to the Draft Supplemental EIS, and the responses to those comments.

1.7 ISSUES TO BE RESOLVED

Several unresolved issues were identified in the Draft EIS. The majority of these issues have been resolved, as indicated below.

1.7.1 Wetland Impacts and Mitigation

In August 2003, the Applicant submitted a Joint Aquatic Resource Permit Application (JARPA) to the U.S. Army Corps of Engineers (Corps) and other applicable resource agencies to mitigate for the project's expected minor loss of jurisdictional wetlands and waters of the U.S. The Corps issues Nationwide Permits (NWP) that authorize minimal project impacts on wetlands and waters. Ecology, contracted by EFSEC, would provide Section 401 water quality certification to the Corps before the NWP is approved.

The Applicant submitted a revised JARPA to the Corps on February 11, 2004, to address four additional underground electrical cable crossings that were identified after the initial JARPA was submitted in August 2003. Based on this new and updated information, total project impacts on wetlands and streams would be 165 and 1,105 square feet, respectively, under the three action scenarios proposed at the time. In the spring of 2004, the Corps determined that the activities described in the February 2004 JARPA are eligible for coverage under NWP 12 (Utility Line Discharges) (Corps 2004). NWP 12 authorizes the KVWPP to place dredged or fill material into waters of the U.S. to construct utility line crossings and road crossings. The Applicant will

comply with the terms and conditions required by NWP 12 for impacts on jurisdictional waters and wetlands, and it is expected that compliance with these requirements would satisfactorily mitigate for potential impacts on these resources. Furthermore, Ecology indicates that an individual water quality certification is not required for the proposed project, but that the Applicant must adhere to the applicable federal requirements mandated by NWP 12 (Kraege, pers. comm., 2004). See Section 3.2 of this Final EIS for further information.

In March 2006, the Applicant submitted a request to extend the Corps' 2004 authorization, and to include provisions for an additional stream crossing resulting from changes to the project layout (Schafer 2006b). The Corps authorized the extension and inclusion of the additional stream crossing in April 2006 (Lehto 2006).

1.7.2 Economic Effects of Various Project Scenarios

The Draft EIS quantified the economic effects for the "middle scenario", based on the turbines the Applicant was most likely to purchase at the time the Application was submitted. Based on the range of project scenarios considered in the Draft EIS, additional quantification of economic effects for the remaining two scenarios was flagged as an unresolved issue.

As described in Section 1.1.2 above, the Applicant proposed revisions to the project that ultimately reduced the proposed number of turbines to a maximum of 65 units. In August 2006, the Economic Development Group of Kittitas County (EDGKC - formerly known as the Phoenix Economic Development Group) prepared an updated economic analysis entitled *Economic Impacts of the Kittitas Valley Wind Project* (ECONorthwest 2006). This document was an update to the former study prepared in August 2002, and which was used to prepare the discussion in the Draft EIS (ECONorthwest 2002). The 2006 ECONorthwest analysis specifically focuses on the economic impacts of a 65-turbine project. In addition, whereas the 2002 ECONorthwest report evaluated the potential economic impacts of the KVWPP and the Desert Claim projects, the 2006 update evaluates the economic impacts of the KVWPP alone. Since the economic impacts are primarily driven by the number of turbines being installed, the size of the turbines (330 feet high versus 410 feet high) does not significantly influence the economic outcome.

1.7.3 Economic and Environmental Effects of Tourism

At the time the Draft EIS was published, the indirect economic and environmental impacts associated with tourism generated by project operations were identified as unknown. Visits to the KVWPP area by tourists can be expected. This conclusion is supported by data collected at operating wind power projects. The level of future tourist activity at the KVWPP cannot be specifically predicted. It is reasonable to assume, however, that potential visitation to the KVWPP would be considerably less than the level of visitation experienced at operating wind plants that are marketed as tourist attractions and provide a range of services to accommodate visitors. Proposed mitigation measures would adequately reduce potential tourism-generated impacts such as increased automobile traffic on local roadways. See Sections 3.7 and 3.10 of this Final EIS for more information.

1.7.4 Impacts on Historical and Tribal Resources

At the time the Draft EIS was published, the indirect visual impacts on potentially affected cultural resources in the immediate project vicinity had yet to be determined and depended upon receipt of requested information from the Washington State Department of Archaeology and Historic Preservation (DAHP) (formerly the Office of Archeology and Historic Preservation) regarding the boundaries of the area of potential effect. In addition, clarification of the National Register of Historic Places (NRHP) eligibility status of the North Branch Canal tunnel had been requested from DAHP to determine indirect visual impacts on this resource.

In July 2004, Lithic Analysts prepared a report entitled *Cultural Landscapes Investigation and Impacts to Historical Inventory for the Kittitas Valley Wind Power Project* (Trautman 2004). This report outlined the potential impacts on the North Branch Canal tunnel and other eligible NRHP resources in the project area, including cultural landscapes. Lithic Analysts found that the project would not indirectly affect potentially significant cultural resources in the project area and that the section of the North Branch Canal in the project area is not eligible for inclusion in the NRHP. DAHP reviewed this report and concurred with the findings. See Section 3.8 of this Final EIS for more information.

In addition, tribal consultation with the Yakama Nation regarding the project's potential effect on tribal resources is ongoing. Should consultation with the Yakama Nation identify significant tribal resources, then there is the potential for the project to result in significant unavoidable direct or indirect adverse impacts due to construction or operation. In correspondence with the Yakama Nation the Applicant offered members of the Yakama Nation use of the project's 550-acre mitigation parcel for cultural and spiritual practices, including the gathering of traditional foods and medicines, throughout the life of the project. The Applicant has not yet received a response to this request.

1.7.5 Television Interference

The current quality of television reception in the Swauk Prairie area, located northwest of the project site, has been surveyed in a preliminary manner and found to be highly variable; televisions in this area rely on standard antennas and are not connected to cable. The project's potential effect on television reception in this area is unknown, but because this area is sparsely populated and existing television reception is poor, the project is not expected to generate complaints of degraded television reception from residents of this area (Polisky, Prefiled Testimony, Exhibit 31).

The Applicant proposes to conduct a baseline field study to precisely measure the current level of television reception in this area. This information will be used to evaluate potential impacts on television reception from the project. After the project is built, the Applicant plans a follow-up field study to determine if the quality of television reception is degraded in this area by the project. If the project does create significant television reception problems for people in this area, the Applicant plans to develop a solution in cooperation with affected residents. Additional potential mitigation for this impact is identified in Section 3.13, Public Services and Utilities.

1.7.6 Radio Interference

All rotating electrical machines generate a certain amount of electrical noise that is a combination of many frequencies. As a result, each generator and its associated systems may create harmful interference. At the time the Draft EIS was published, information regarding the frequency spectrum of electrical noise generated by the wind turbine generators at locations surrounding the generator had been requested from the Applicant but had not yet been provided. Since publication of the Draft EIS, the Applicant and its consultants analyzed the issue of radio interference for the KVWPP using field data taken from one of the Applicant's operating wind power projects in Iowa. Based on this new analysis (Comsearch 2004), the proposed KVWPP's wind turbines would not disturb radio operations in the project area beyond what is typical for suburban areas from either electromagnetic interference or physical obstruction. See Section 3.13 of this Final EIS for further information.

1.8 SUMMARY OF IMPACTS AND MITIGATION MEASURES OF PROPOSED ACTION AND NO ACTION ALTERNATIVE

Potential environmental impacts from the proposed action and the No Action Alternative are described in Chapter 3 of this EIS. Types of measures to avoid or reduce adverse environmental impacts resulting from the project presented in the EIS include: (1) measures inherent in project design; (2) best management practices (BMPs) incorporated into construction and operation; (3) mitigation measures proposed by the Applicant; and (4) additional mitigation measures recommended by governmental agencies participating in the SEPA review.

This section provides a summary of the direct, indirect, and cumulative impacts for the proposed action. Direct impacts include both construction, operational, and decommissioning impacts and occur as an immediate result of the proposed action. Indirect impacts are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Cumulative impacts occur in combination with previous or simultaneous development in the project area (see Section 1.9, below). The No Action Alternative would not have significant adverse impacts on the environment at the particular location of the proposed project. Other environmental impacts could result from power providers' continued use of other or new power sources to meet the needs of their customers. The EIS also identifies impacts that cannot be mitigated. These impacts are identified as "significant unavoidable adverse impacts" and are discussed under each element of the environment.

Table 1-4, Summary of Impacts and Mitigation Measures, provides a synopsis of the environmental analysis for the proposed action and the No Action Alternative for each element of the environment. It lists construction, operations and maintenance, and decommissioning impacts.

Cumulative and significant unavoidable adverse impacts are summarized below in Sections 1.9 and 1.10, respectively.

1.9 CUMULATIVE IMPACTS

The Pacific Northwest has short-term and long-term supply needs for electrical power. The WECC forecasts electricity demand in the western United States. According to WECC's most recent coordination plan, the 2001-2011 summer peak demand requirement is forecasted to increase at a compound rate of 2.5% per year (WECC 2002).

The NWPCC regularly prepares a 20-year forecast of electricity demand in the Pacific Northwest. NWPCC's latest long-term forecast found that the total consumption of electricity is forecasted to grow from 20,080 average MW in 2000 to 25,423 average MW by 2025, an average yearly rate of growth of just under 1% (NWPCC 2003).

Although the environmental impacts of proposed power projects are typically evaluated on an individual basis, the recent number of wind power generation applications in Kittitas County has prompted EFSEC to consider potential cumulative impacts. The Kittitas Valley, Wild Horse, and Desert Claim wind power projects are three similar but independent developments proposed in Kittitas County. The Wild Horse Project received approval from the State of Washington in July 2005. The Desert Claim Project sought approval through Kittitas County, and was denied in April 2005 (BOCC 2005). Desert Claim Wind Power LLC submitted an Application for Site certification to EFSEC in November 2006 (Desert Claim Wind Power LLC 2006). The Wild Horse Project began construction in the fall of 2005, and is expected to begin commercial operation in December 2006. Since construction of the Wild Horse Project will be essentially completed by Spring of 2007, cumulative impacts of the Wild Horse Project would only apply for permanent impacts and impacts associated with the operational phase.

The Kittitas Valley and Desert Claim projects are relatively close to each other (within approximately 1 mile at the closest point), while the Wild Horse project is 14 miles from the Desert Claim project and 21 miles from the Kittitas Valley project. SEPA requires consideration of cumulative impacts. A brief description of the Desert Claim and Wild Horse projects is provided in Chapter 3, Section 3.14. Potential cumulative impacts associated with the Kittitas Valley, Wild Horse, and Desert Claim wind power projects are addressed in Section 3.14 for each resource topic, and are summarized below.

Land uses (and associated population growth) within Kittitas County, both current and projected, would also contribute to cumulative impacts. Future land use in the project vicinity is assumed to continue as primarily agriculture. Anticipated population growth within the county would require additional infrastructure, services, and housing. The forecasted population for the year 2020 is 41,776, an increase of 6,976 people since 2002. Assuming 2.5 people per household, an additional 2,790 housing units will be necessary to support this population increase. According to the Comprehensive Plan, approximately 55% of this growth will occur in unincorporated Kittitas County with the remaining 45% allocated to municipalities (Kittitas County 2000). Potential cumulative impacts associated with this land use and corresponding growth are addressed in Section 3.14 for applicable resources topics and summarized below.

1.9.1 Earth Resources

Significant cumulative impacts on soil, topography, and geology resulting from construction of the three proposed wind power projects in Kittitas County are not anticipated. Impacts on earth resources from development of the three wind power projects would generally be confined to localized, temporary erosion impacts from ground disturbance during construction. The intensity of impacts on near-surface soils would be within the construction footprint for the respective project and would not be overlapping in geographic extent and the impacts of the respective projects would not represent the potential for significant cumulative impacts on earth resources.

Cut and fill would be required to construct access roads, tower foundations, transformer pads, and other project facilities. Given the magnitude of offsite gravel resources that could be imported to the KVWPP site, the cumulative effect on offsite fill resources could be substantial if all projects used offsite sources for fill materials.

In addition, construction of the three proposed wind power projects could result in a loss in area where Ellensburg Blue agate is potentially found and a potential reduction in the amount of this resource available for prospecting. Cumulative cut and fill activities could also destroy agate.

Cumulative impacts from seismic hazards would not occur from the wind power projects and county-related growth, assuming projects are designed to withstand the seismic risk.

Development associated with population growth within the county would result in localized impacts from ground disturbance and cuts and fills for infrastructure, support services, and housing assuming construction follows prescribed engineering standards and requirements. Future agricultural activities are not anticipated to appreciably affect earth resources.

1.9.2 Vegetation, Wetlands, Wildlife, and Fisheries

Vegetation

Implementation of the proposed wind power projects would result in the loss of vegetation through clearing and ground disturbance, including the potential loss of lithosols, a unique habitat often associated with the shrub-steppe region. The combined figures for the three projects amount to approximately 350 total acres of existing vegetation lost, including 216 acres of shrub-steppe and 97 acres of lithosol habitat. In the context of the three wind power project areas that collectively cover approximately 19,380 acres, the approximate 2% loss of vegetation at each project site would not be considered an adverse cumulative effect. This combined loss of vegetation would similarly not be considered cumulatively adverse in a more regional context. Because the precise regional extent of lithosol habitat is not quantitatively known, it is difficult to assess the specific magnitude of cumulative lithosol impacts at the three wind power project sites within the context of the surrounding region.

No federally listed rare plants were identified at either the Kittitas Valley or Wild Horse project sites. One Washington State listed species, hedgehog cactus, was found extensively in lithosolic habitats at the Wild Horse project site, but less than 10% of the individuals identified during a

rare plant survey are considered at risk from direct impact from the Wild Horse project (Taylor, pers. comm., 2003). Field surveys of wet meadow habitats at the Desert Claim project site resulted in no findings of Ute ladies'-tresses, an orchid that is federally listed as endangered. No other rare plants protected by either the federal or state governments were found in searches of the areas of likely disturbance in the Desert Claim project area (Kittitas County 2003a). The minimal potential impacts of the proposed wind projects on rare plants would not represent a significant cumulative impact on any species.

Wetlands

Cumulative impacts of the three proposed wind power projects on wetlands could result from directly filling or grading wetland systems, as well as from indirect effects caused by stormwater runoff, increased pollutant loading, and water quality degradation, which in turn could result in loss of wetland diversity and reduced wetland functions and values. The Kittitas Valley project would disturb approximately 165 square feet of two small potential wetland systems at the project site. As presented in the November 2006 Application for Site Certification, the Desert Claim project would not have any wetlands impacts; project facilities have been sited outside of any wetlands areas and their designated buffers. No wetlands were identified within a 164-foot buffer around the planned locations for Wild Horse project facilities; therefore, no impacts on wetlands have ocurred for that project.

Wetland impacts of the Kittitas Valley project would be minimized through avoidance, and mitigated as required by federal and local regulations for wetlands that would not be avoided. Because the collective effects of these projects are not expected to extend to downstream surface waters or wetlands, no significant cumulative impact on wetland resources is expected.

Development associated with population growth may incrementally reduce wetlands in the county. The development is scheduled to occur within rural and designated-municipal Urban Growth Areas. Development that affects wetland resources will be subject to wetland regulations.

Wildlife

Some temporary displacement of wintering mule deer and elk is anticipated from winter construction activities of the three wind projects. These temporary impacts may be greater if construction occurs simultaneously on two of the projects because of the larger area subject to disturbance. During the construction period, deer would likely be temporarily displaced from the three project sites because of the influx of humans and construction equipment and associated noise and disturbance. Temporary loss of habitat from project construction would be considered a minor impact because of the availability of suitable habitat for mule deer near the proposed projects. Based on the distances of elk calving areas from the three proposed wind power projects, no cumulative impacts on elk calving areas are anticipated.

Human activity levels from operation and maintenance at the Kittitas Valley and Desert Claim projects would not greatly differ from current human activity levels. Human activity levels from operation and maintenance at the Wild Horse site would occur at a low level year-round. While

operational impacts on wintering mule deer and elk at the Wild Horse site may be greater than under existing conditions, cumulative impacts for all three wind power projects are expected to be low.

The estimated combined raptor mortality rate for the three wind power projects could be up to 27 raptor fatalities per year with 282 turbines. Given the distances between the Wild Horse, Kittitas Valley, and Desert Claim projects, and the typical home ranges of the raptors at risk of collision at the three projects, the same individual breeding raptors that use the Kittitas Valley and Desert Claim project areas are not expected to use the Wild Horse project area.

The cumulative impacts on bald eagle winter habitat from all projects would be small. During project operation, bald eagles that occupy the area would be at some risk of collisions with turbines. Assuming risk of collision is proportional to bald eagle use at a given site, the overall risk of one bald eagle fatality every two to three years would be expected to occur only at the KVWPP and Desert Claim project sites. The Wild Horse project is not expected to contribute to bald eagle impacts because the site does not provide good roosting or foraging opportunities. Observed bald eagle use of the Wild Horse project site appeared to be incidental, with no patterns of regular use (EFSEC 2004a, 2005a). Based on these estimates, the cumulative effects of this low level of mortality on the increasing winter bald eagle population in the Kittitas Valley and the State of Washington would not be measurable.

It is expected that passerines would make up the largest proportion of bird fatalities for the three projects combined. Based on the mortality estimates from other wind projects studied, combined passerine mortality for the three projects would range from 180 to 1000 fatalities per year. This level of mortality is not expected to have any population-level consequences for individual species.

A few of the species observed at these project sites have documented, declining populations in the Columbia Plateau, including Brewer's blackbird, Brewer's sparrow, horned lark, loggerhead shrike, western meadowlark, mourning dove, and killdeer. Of these species, horned lark and western meadowlark have the highest collision risks. Increased risk of mortality for these species may contribute to declines in local populations (EFSEC 2004b).

Using mortality estimates from other wind projects (one to two bat fatalities per turbine per year), total annual bat mortality for all three wind power projects in Kittitas County is expected to range from 282 to 564 bat fatalities. However, the significance of bat mortality from the three projects is hard to predict because there is very little information available regarding the size of bat populations. Studies suggest, however, that resident bats do not appear to be significantly affected by wind turbines (Johnson et al. 2003; Gruver 2002) because nearly all mortality is observed during the fall migration period.

Construction of the three wind power projects would reduce foraging and breeding habitat for wildlife such as badger, coyote, pocket gophers, rabbits, mice, and voles. Impacts on reptiles and amphibians would also occur.

In addition to the three wind projects, development associated with population growth within the county would result in localized and incremental impacts on wildlife resources associated with the construction of infrastructure, support services, and housing. These impacts would include the reduction of habitat for a variety of species and an incremental reduction in populations of species occupying habitats at the wind energy sites and areas of anticipated future population growth.

Fisheries

No impacts on fish habitat or fish species associated with construction and operation of the KVWPP are anticipated. Similarly, the Wild Horse project would not result in adverse impacts on fish or fish habitat onsite or in downstream areas. With the mitigation measures presented in the Application for Site Certification, development of the Desert Claim project is not expected to result in disturbance or displacement impacts on streams and riparian zones in the project area

Because the effects of these projects would be negligible and would not extend to downstream waters, no significant cumulative effect on fishery resources is expected (EFSEC 2004a).

Development associated with population growth may incrementally affect fish habitat in the county. Development scheduled to occur within rural and designated Urban Growth Areas would increase impervious surface area and modify stream flows. Development that affects stream resources would be subject to critical areas regulations.

1.9.3 Water Resources

Cumulative effects to surface water resources could result from increases in the amount of impervious surfaces that in turn could alter the amount and quality of drainage to area creeks and other water features. However, because the three projects are sufficiently distant from each other and are located in different tributary watersheds, there would not be combined effects from multiple projects on the same stream or aquifer. The minor, localized effects of each project would occur within the drainages of minor tributaries to the Yakima River and the Columbia River and at a distance of at least several miles upstream from either river. Therefore, significant cumulative effects on water resources within the Upper Yakima River basin or the northeastern portion of the Kittitas Valley are not expected, even if all three projects were constructed.

Development associated with projected population growth in the county would incrementally increase water demand within urban and rural areas. The projected operational water demand for the three wind projects would have a negligible effect on water quantity conditions for surface water and groundwater resources because the projects would have minimal demands for water consumption.

1.9.4 Health and Safety

The potential for exposure to fuel and non-fuel hazardous substances would increase, particularly during the construction period if construction periods were to overlap. However, the effects

would be localized in the area of the spill, and would not be likely to result in an adverse cumulative impact.

The greatest fire risk for each project would occur during the construction period, because of the level of activity and the numbers of workers and equipment active at that time. The greatest cumulative fire risk would occur if and when construction schedules for the KVWPP and Desert Claim Project overlapped. However, while the wind energy projects would introduce additional human activity, machinery, and fuels into the affected environment for each project, they would also implement fire protection measures, including having trained personnel onsite to respond to fires. In addition, the construction program for each project would include contracted fire protection services from the respective local rural fire districts, which would facilitate response to fire incidents. Therefore, it is unlikely that the cumulative risk of potential fires associated with construction of the three proposed wind turbine projects would be significant.

Certain fire risks specific to wind energy projects would also exist during the operating period for each project. The presence of turbine towers where none currently exists would likely increase the probability of lighting strikes and, despite the grounding systems that the wind power projects would use, the likelihood of fire. Project towers would also increase the chance of impact by low-flying aircraft, which could result in a fire. Appropriate marking and lighting of the towers would lessen the probability of occurrence. However, the probability would be proportional to the number of wind power projects and, thus, the number of towers constructed. Specific measures to counteract or manage fire risks would be implemented during project operation. For example, the project facilities would be continually monitored, the project areas would be regularly patrolled, and access to the project areas would be limited. Therefore, the concurrent operation of the three proposed wind power projects would not likely pose a cumulatively significant increased fire risk.

Site-specific health and safety concerns associated with wind energy production include the potential for ice to be thrown from rotating blades, blades to disengage and be thrown from the tower, and tower collapse during extreme weather conditions. These potential health and safety impacts from the three projects would be localized in nature and would not be expected to be cumulatively significant.

Potential shadow flicker impacts from the three proposed wind power projects would be limited to the immediate vicinity (approximately 2,000 feet) of the wind turbines within each respective project area. Some residences that are close to turbine locations for the Desert Claim or Kittitas Valley projects would be subject to shadow flicker for varying numbers of hours per year. These impacts would be limited to a number of discrete locations that are well separated from each other, and would not constitute a cumulative impact from these two proposed projects.

The electric and magnetic fields associated with the three proposed wind power projects would be less than those produced by electrical facilities already present in the vicinity of the respective project areas, and would diminish to background levels at distances within which public exposure could occur. Therefore, there would not be cumulative exposure impacts from development of multiple wind energy projects.

1.9.5 Energy and Natural Resources

When combined with other planned wind projects in the region, construction activity associated with the KVWPP would contribute to local energy and natural resource demands. The combined demands of the three projects for fuel and construction materials would cumulatively contribute to the local and regional demand for, and irreversible expenditures of, nonrenewable resources on a temporary basis.

The three proposed wind power projects would provide a combined nameplate capacity of up to 604 MW of electricity . Assuming long-term operation of the three projects at a typical plant factor of 33%, combined they would produce approximately 200 average MW of electricity on a long-term basis. Two proposed hydroelectric projects in Kittitas County (Easton Diversion and Kachess to be developed by Symbiotics LLC) would generate 6.2 additional MW of electricity (Northwest Power Planning Council 2004). The collective energy output of 610.2 MW from those five projects represents the first electrical generating facilities in Kittitas County. Operation of these three wind and two hydroelectric projects would also cumulatively add to the capacity, production, and availability of renewable energy sources in Washington State and the greater Pacific Northwest. The projects would provide a sustainable, renewable source of electric power supply to supplement the region's existing hydroelectric, nuclear, and coal or gas-fired power projects, although it would represent a relatively small addition to the total regional electricity supply.

Development associated with population growth within the county would result in demand for energy and natural resources for the construction of infrastructure, support services, and housing. These impacts would include the use of petroleum products, wood, steel, sand, and gravel.

1.9.6 Land Use and Recreation

Development of the KVWPP concurrent with the proposed Desert Claim and Wild Horse wind projects would convert approximately 350 acres of open space and rangeland uses in central Kittitas County to wind energy production. In the short term, proposed wind energy facilities would not collectively disrupt or change the underlying land use pattern of this portion of the county. While some localized land use conflicts could occur based on the location of specific turbines, these are seen as site-specific and not indicative of conflict with the broader underlying rural land use pattern.

Temporary population increases associated with construction workers from the KVWPP and Desert Claim Project could cumulatively increase demand for and use of local and regional recreation resources during overlapping construction periods.

Individually or collectively, the proposed projects would not likely attract supporting uses or generate spin-off development. Also, the relatively small number of full-time employees would not create cumulative demand for services or create pressure to change or convert existing land uses.

1.9.7 Socioeconomics

The proposed projects could contribute to increases in temporary and permanent job opportunities and populations in the region. The majority of cumulative population and housing impacts would be temporary and would occur during construction. Assuming that the KVWPP and Desert Claim Project are constructed simultaneously, temporary population increases resulting from construction work forces could result in cumulative effects to the local housing supply. However, it appears that the study area has an adequate supply of temporary housing to accommodate the potential cumulative increase in construction workers from outside the area.

The three wind power projects would increase retail sales and overall economic activity in the area, as well as employment opportunities for residents of Kittitas County. The three projects would also increase the amount of annual property tax revenue to the county.

Projected population growth in the county (6,976 additional people by 2020) would increase the demand for housing, infrastructure, and support services. The estimated number of full-time workers for the three projects (32 to 38) represents less than 1% of the anticipated population growth in the county.

1.9.8 Cultural Resources

Constructing the three proposed wind power projects would result in ground disturbance that could potentially impact identified and unidentified prehistoric or historic sites, as well as cause impacts on traditional cultural properties. Cultural resource surveys have been conducted at each of the project sites. Direct and indirect impacts on cultural resources within the three project areas would occur within the context of comparable impacts from past and ongoing land uses in the vicinity.

Tribal representatives of the Yakama Nation have expressed concern about the cumulative effect wind power projects could have on tribal and traditional and accustomed use lands. Efforts to bring together wind farm applicants, government agencies, and tribal representatives to discuss these and other issues of concern are ongoing.

While impacts from these and other projects in the county could result in a net cumulative loss of cultural resource values in the region, mitigation programs in each individual project would help to limit project-specific impacts, thereby reducing overall cumulative impacts on cultural resources.

1.9.9 Visual Resources

There are a number of locations in the Kittitas Valley where the Desert Claim project could be seen in the foreground to middle ground and the KVWPP could be seen in the middle ground to background. However, the addition of the KVWPP from these viewing locations would not substantially increase the effect that the Desert Claim project alone would have on the visual character and quality of these views. Because the Wild Horse project is located far from the other two projects and in an entirely different portion of the landscape, it has limited potential to be

seen in the same view as the other two projects. Travelers on Interstate 90 (I-90), however, would be likely to recall having seen a collection of wind turbines a few minutes before seeing more wind turbines. This progressive realization could leave the impression with some viewers that wind turbines are plentiful in Kittitas Valley. The development of the three proposed wind power projects would also cumulatively contribute to increased nighttime lighting in the Kittitas Valley. These lights are likely to have an adverse cumulative effect on views from residential properties in the vicinity of the Kittitas Valley and Desert Claim project areas.

Development associated with population growth within the county would result in both localized and landscape-scale changes in visual resources. These changes would occur because of the changes in land use with the construction of infrastructure, support services, and housing to support the population increases.

1.9.10 Transportation

The Draft EIS considered the impacts to transportation systems if all three projects were to be constructed simultaneously. The Draft EIS determined that the segment of I-90 immediately west of Exit 106 (to US 97) may temporarily carry construction traffic for all three projects. The combined construction traffic volumes would result in an operating condition that is still within the numerical range for LOS B. This impact was determined acceptable by county and state standards, and it is anticipated that the LOS would return to background conditions (LOS A) once the projects are completed.

With the Wild Horse Project finishing major construction activities in late 2006, it is likely that the anticipated impacts will be less than those expected with all three projects under construction. However, if turbine components or offsite gravel materials were delivered to the KVWPP and Desert Claim project at the same time, there could be increased delays or additional detours within the area near the Desert Claim and Kittitas Valley projects.

Development of multiple wind farms in the Kittitas Valley area would likely result in a larger total number of tourists visiting wind project facilities, relative to the level of activity with a single project. However, the tourist traffic would likely be localized to the individual areas around the projects and would not likely be additive or cumulative (i.e., it is likely that most tourists interested in wind energy would visit any one of the projects, but would not visit two or all three projects).

Aircraft operations in the Kittitas Valley are centered at Bowers Field. Airspace over and near the Yakima Training Center near the Wild Horse project is restricted by military operations in that area. Given its location, the proposed Desert Claim project as originally proposed represented a cumulative addition to natural and constructed features within the Bowers Field airspace. Ten of the proposed turbines were expected to intrude into the protected airspace for Bowers Field. However, this issue was resolved in early 2005 when the Federal Aviation Administration (FAA) approved an increase of the Traffic Pattern Altitude to 1,540 feet (Steeb 2006). The Kittitas Valley and Wild Horse projects would not potentially conflict with air traffic operations at Bowers Field or other facilities, and there would be no cumulative significant impacts on air transportation resulting from development of those projects.

1.9.11 Air Quality

Gravel needed for construction of the Kittitas Valley and Desert Claim projects would likely be transported from offsite sources. This activity could result in a temporary increase in localized cumulative air quality impacts on travel routes shared by the two projects, but not at a broader, countywide level. This potential impact would be greatest if construction activities for the Kittitas Valley and Desert Claim projects overlapped and occurred during periods of peak winds.

Based on the prevailing west-northwesterly wind direction, it is possible that dust generated by construction activity in the Kittitas Valley project area could be carried into portions of the Desert Claim project area during peak wind conditions and contribute to localized dust impacts in that area. In general, however, any dust emissions that might be transported beyond the boundary of the two project areas would typically be carried into undeveloped areas to the east and southeast, rather than into the more populated areas of Kittitas Valley (Kittitas County 2004).

The air emissions from contemporaneous construction of the KVWPP and Desert Claim Project would be additive in terms of their contribution to total regional pollutant loads. However, it is not anticipated that the incremental impact of the aggregate air emissions from construction of both wind power projects would be sufficient for regional air pollutant concentrations to temporarily exceed the applicable air quality standards.

No significant aggregated air pollutant concentrations that would exceed national or Washington State ambient air quality standards are anticipated. In addition, the generation of electricity through the three proposed wind power projects would avoid cumulative emissions of regulated pollutants from other fossil fueled sources of power that would have otherwise been built or operated to produce an equivalent amount of electricity.

Development associated with population growth (6,976 additional people by 2020) in the county would incrementally increase exhaust and dust emissions from construction and operation of infrastructure and housing and resulting increases in vehicular traffic. The incremental impact would not be sufficient for regional air pollutant concentrations to exceed applicable air quality standards.

1.9.12 Noise

Construction noise generated by the KVWPP and Desert Claim Project would be temporary in nature, and would primarily be from operation of construction equipment and vehicles. The magnitude of this temporary cumulative impact would depend upon the timing of construction activities but any adverse effects would be limited to the area immediately surrounding each construction site.

The Kittitas Valley and Desert Claim projects are a sufficient distance apart that residents near the Desert Claim project would not also experience elevated noise levels from operation of Kittitas Valley project facilities, and vice versa. Noise modeling results for both projects indicate

that receptors located between the two projects would be unlikely to experience noticeable increases in noise levels as a combined effect of project operations.

Development associated with population growth within the county would likely result in localized and incremental increases in the sources of noise and background noise levels. Short-term increases in noise levels would occur with construction of infrastructure and housing. Long-term noise increases would occur as development takes place in urbanizing areas. These noise increases would be confined to specific locations.

1.9.13 Public Services and Utilities

Concurrent development of the three projects could create significant additional demand for law enforcement, fire protection, and emergency medical service response during both construction and operations and maintenance phases. The level of impact would depend on the timing of concurrent construction activities as well as the availability of emergency response resources at the time of an incident.

Increased permanent worker populations required to operate the three proposed wind farms could contribute to increased cumulative demands for school services in central and eastern Kittitas County. However, local residents would probably fill a portion of the operations jobs and it is unlikely that all of the in-migrants would have school-age children or would locate in the same school district. Therefore, no significant cumulative adverse impacts on schools are anticipated from project operation.

Cumulative impacts on utility service providers would consist primarily of cumulative increases in the demand for solid waste disposal services. However, this increased demand is not anticipated to be significant with respect to either collection capability or the capacity of the county's construction and demolition waste disposal site. No long-term cumulative impacts on regional water and wastewater treatment plants are anticipated because water and wastewater demands would be limited to temporary needs generated during construction activities and those from operations and maintenance staff.

No significant cumulative impacts on electricity or telecommunications are anticipated. Based on the distances between residences and the respective project facilities, there does not appear to be a potential for cumulatively significant interference impacts on radio and television reception in the areas near the proposed wind power projects.

In order to connect to either the Bonneville or PSE grids, the three wind power projects would require interconnection and transmission agreements that comply with Federal Energy Regulatory Commission and National Electric Reliability Council standards. The interconnection and transmission agreements would ensure the safe and reliable delivery of power from the project to the grid.

To gain access to the grid, every type of power project must apply for access under the utility's Open Access Transmission Tariff. Under this system, both a detailed System Impact Study and a

Facility Study need to be performed by the interconnecting host utility. All three projects are currently under study by both Bonneville and PSE.

1.10 SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

The Applicant, during the preliminary design of the proposed project, has mitigated several potentially significant adverse impacts associated with the proposed action. However, even with implementation of Applicant proposed mitigation measures as well as additional mitigation measures recommended in this EIS, the following have been identified as significant unavoidable adverse impacts of the proposed action:

1.10.1 Cultural Resources

If consultation with the Yakama Nation identifies significant tribal resources at or near the project site, such as natural resource gathering, or history, cultural, and religious areas, the project could cause significant unavoidable direct or indirect adverse impacts from construction or operation. Mitigation measures appropriate for the affected resource should be developed by the Applicant and approved by EFSEC and the Yakama Nation before any potential construction begins. The Applicant proposed to establish procedures to be followed in the event of any unanticipated finds during the construction and decommissioning phases of the proposed project, in coordination with EFSEC, the Washington State Department of Archeology and Historic Preservation, and affected tribes.

1.10.2 Visual Resources

For many viewers, the presence of the wind turbines represents a significant unavoidable adverse impact because it significantly alters the appearance of the rural landscape over a large area of the Kittitas Valley. Nighttime lighting of the tops of some turbines would similarly be considered a significant unavoidable adverse impact. The perceived significance of these impacts depends on the viewer's location and sensitivity and the impact on view quality.

1.10.3 Threatened and Endangered Species

While potential bald eagle fatalities associated with operation of the project are possible, the likelihood is considered remote because there have been no documented bald eagle fatalities at other wind power projects in the United States. Any loss of a bald eagle would be considered a significant unavoidable adverse impact. However, the permitting process under Section 10 of the Endangered Species Act allows private individuals and states to receive exemptions from the prohibitions on incidentally "taking" (i.e., harming) threatened and endangered species.

1.11 SUMMARY OF IMPACTS OF OFFSITE ALTERNATIVES

Table 1-4, Comparison of Potential Impacts and Mitigation Measures of Proposed Action and Offsite Alternatives, summarizes the comparative merits between the proposed action and the two offsite alternatives.