CHAPTER 1: SUMMARY

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 between 82 and 150 wind turbine generators with a total nameplate capacity of between 181.5 to 246 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 the Revised Code of Washington (RCW) 80.50.060. EFSEC has jurisdiction over the evaluation of major energy facilities including the proposed project. As such, EFSEC will recommend approval or denial of the proposed wind facility to the governor of Washington after an environmental review.

With the submission of the ASC and in accordance with the Washington State Environmental Policy Act (SEPA) (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 Draft EIS are based primarily on information provided by the Applicant in the ASC No. 2003-01 (Sagebrush Power Partners LLC 2003a). Where additional information was used to evaluate the potential impacts associated with the proposed action, that information has been referenced. EFSEC's environmental consultant, Shapiro and Associates, Inc., did not perform additional studies during the preparation of this Draft EIS.

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 demands for electricity produced from non-renewable 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]).

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 1-1, 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 1-1: 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 Puget Sound Energy (PSE) and Bonneville Power Administration (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.

There is a growing market for electricity powered by "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 hydropower, 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. In particular, there has been a proliferation of requests from electric utilities to purchase wind power. Several electric utilities have recently issued requests for proposals (RFPs) to acquire wind power, including Puget Sound Energy, Avista Corporation, and Portland General Electric.

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 green energy.

1.3 DECISIONS TO BE MADE

This document is a SEPA Draft EIS intended to meet the environmental review needs of EFSEC. EFSEC has jurisdiction over all of the evaluation and licensing steps for siting major energy facilities in the state of Washington. If the proposed project is approved by the governor of Washington State, EFSEC would specify the conditions of construction and operation, issue a Site Certification Agreement in lieu of any individual state or local permitting authority, and manage the environmental and safety oversight program of project operations. EFSEC's Site Certification Agreement acts as an umbrella authorization that incorporates the requirements of all state laws and regulations. EFSEC will issue the Final EIS and will make a recommendation to the governor of Washington to approve or deny the proposed project.

EFSEC is the sole non-federal agency authorized to permit the proposed project. For informational purposes, Table 1-2 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.

1.4 DESCRIPTION OF ALTERNATIVES

Two alternatives are evaluated in this EIS, the Proposed Action Alternative (constructing and operating the KVWPP and associated components), and the No Action Alternative (not constructing and operating the proposed action). These alternatives are described below. Alternative wind energy technologies, alternative wind turbine locations, and offsite alternatives considered by the Applicant and eliminated from further study are also described.

1.4.1 Proposed Action

The proposed action is to construct and operate between 82 and 150 wind turbine generators with a total nameplate capacity of between 181.5 and 246 MW and associated components in Kittitas County, Washington (Figure 1-1). Depending on the type of wind turbine technology used, the proposed project would occupy between 93 and 118 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 following three project scenarios:

- Lower End Scenario: The lower end scenario represents the project configuration with the lowest number of turbines erected. For turbines with a nameplate capacity of 3 MW each, up to 82 turbines would be used for a total nameplate capacity of 246 MW.
- Middle Scenario: The middle scenario represents the project configuration that would be chosen based on current pricing and performance for wind turbine technology currently on the market. For turbines with a nameplate capacity of 1.5 MW each, 121 turbines would be used for a total nameplate capacity of 181.5 MW.
- Upper End Scenario: The upper end scenario represents the project configuration with the highest number of turbines erected. For turbines with a nameplate capacity of 1.3 MW each, up to 150 turbines would be used for a total nameplate capacity of 195 MW.

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

- approximately 19 miles of new roads,
- improvements to roughly 7 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 nine permanent meteorological towers.

The KVWPP would be constructed across a land area of approximately 7,000 acres in Kittitas County, although the actual permanent facility footprint would comprise between 93 to 118 acres of land under the middle and lower end scenarios, respectively. (Note that the lower end scenario has a larger footprint because it would require wider roadways to accommodate bigger turbine towers.) 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.

Figure 1-1

Figure 1-2

Table 1-2

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., 1.3 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 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 operational problems and a lower return on investment) and/or remoteness from nearby transmission lines (which would require constructing a lengthy transmission line to interconnect with the power grid).

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.

1.4.3 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.

Power providers would continue to use other or new power sources to meet the needs of their customers. However, it is likely that the region's need for power would be addressed by

developing a gas-fired combustion turbine; such a facility 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.

1.4.4 Offsite Alternatives

A consideration of other possible sites available for wind power generation was coordinated by EFSEC and Kittitas County. The analysis of these other potential sites is being provided in this EIS in response to scoping comments suggesting the viability of other sites for wind power project development. Four geographic areas within Kittitas County, identified as having the potential for viable wind resources were identified for investigation: west of US 97, east of US 97, Whiskey Dick Mountain, and south of Whiskey Dick/Boylston Mountains. Sites identified in these areas were screened against criteria of wind resource availability, proximity to existing transmission facilities with adequate capacity, large land area, absence of significant environmental constraints, and property owner interest/property availability. Although other sites for wind power generation may exist in Kittitas County, none would satisfy the test for availability or practicability for the current proposal.

1.5 SUMMARY OF PUBLIC INVOLVEMENT, CONSULTATION, AND COORDINATION

The Applicant has been communicating and meeting with agencies, Indian tribes, the public, and non-governmental organizations throughout development of the proposed project and will continue through the EIS process. EFSEC has also conducted public informational and EIS scoping meetings. Agencies and members of the public were invited to comment on the scope of the EIS during a 30-day comment period from February 14 to March 14, 2003. Two meetings were held on March 12, 2003 at the Ellensburg County Fairgrounds to provide information on the project and to receive comments on the scope of the EIS; the first meeting was for agencies and the second meeting was for the public. Prior to these meetings, public notices were mailed to local and regional newspapers, and press releases were issued to local and regional radio stations and newspapers. In addition to the public informational and scoping meetings, EFSEC held a public meeting and land use consistency hearing on the proposed project in Ellensburg on May 1, 2003. EFSEC initiated the adjudicative process through a notice of opportunity for intervention, and plans to conduct adjudicative hearings on the project (including public witness testimony hearings) during the second half of 2003.

EFSEC has 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 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. Consultation with the Yakama Nation is ongoing.

Project documents are available to the public on the EFSEC Web site and in local libraries. Further opportunities for public involvement will occur throughout the remainder of the siting evaluation process. A public comment hearing for the Draft EIS will be scheduled during the 30-day comment period, and additional public comment will be received by EFSEC through adjudicative hearings to be held before the Final EIS is issued.

1.6 DOCUMENT ORGNANIZATION

This Draft EIS analyzes the proposed KVWPP (the proposed action) and a No Action Alternative. The document is organized into three main chapters.

- Chapter 1 summarizes this Draft 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.
- Chapter 2 presents a description of the two 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.

1.7 ISSUES TO BE RESOLVED

The following unresolved issues require further evaluation and decision by the Applicant and EFSEC.

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 would provide Section 401-water quality certification to the Corps before the NWP is approved. Depending on the total project impacts and which NWP the Corps assigns, Ecology may require compensatory mitigation for the project. Therefore, the specific mitigation requirements to compensate for loss of wetlands and water resources at the project site is considered an issue of uncertainty that has yet to be resolved.

1.7.2 Economic Effects of Lower and Upper End Scenarios

Although economic effects were fully quantified for the middle scenario, quantifiable economic impacts for the lower and upper end scenarios are not available at this time. Indirect and induced employment and income impacts for both the construction and operations phases of the project were determined using the IMPLAN input-output model developed by the U.S. Department of Agriculture (in cooperation with other federal agencies) with data specific to Kittitas County). This model requires the input of several discrete variables, including the amount of local spending on construction materials and on equipment and materials to operate the wind turbines, and the amount of spending on food and lodging for non-local labor brought to Kittitas County for the construction period. Specific model inputs have not been developed for the lower end (i.e., 82 turbine) or upper end (i.e., 150 turbine) scenarios. Similarly, an estimate of potential tax revenues generated under the lower and upper end scenarios has not been conducted; therefore, the potential effects on the local tax base of these two scenarios has not been quantified. However, it is reasonable to assume that the margin of error surrounding the value of the model inputs used for the middle scenario would be about +/- 10 to 15%, and that the input values for the lower and upper end scenarios would fall within this range. Therefore, the employment, income, and tax revenue effects of the lower and upper end scenarios during construction and operations would be estimated at +/- 10 to 15% of the middle scenario (Taylor, pers. comm., 2003). Further quantification would resolve uncertainty associated with this issue.

1.7.3 Economic and Environmental Effects of Tourism

The indirect economic and environmental impacts associated with tourism generated by project operations are unknown. Although new tourists who visit the project site and spend money in the project area could generate induced, beneficial economic effects in the local economy, the projected volume of visitors to this project site, either on a daily or annual basis, is unknown. Similarly, it is unknown to what extent visitors attracted to the project site would represent new tourists that otherwise would not have visited the project area. Examples of potential environmental effects of tourism include degradation of the level of service on project area roadways due to increased automobile and bus trips and increased demand for parking at the O&M facility. Therefore, in the absence of specific data, the potential economic and environmental effects of tourism are considered an issue of uncertainty that has yet to be resolved.

1.7.4 Impacts on Historical and Tribal Resources

The indirect visual impacts on potentially affected cultural resources in the immediate project vicinity have yet to be determined and depend upon receipt of requested information from the Washington State Office of Archaeology and Historic Preservation regarding the boundaries of the area of potential effect. In addition, clarification of the National Register of Historic Places eligibility status of the North Branch Canal tunnel has been requested from the Office of Archaeology and Historic Preservation to determine indirect visual impacts on this resource. In the absence of this information, the potential for indirect impacts on cultural resources in the KVWPP area is identified as an unresolved issue.

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; this is considered an issue to be resolved.

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 potential effect the project may have on television reception in this area is unknown. 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. In the event that 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. To date, information regarding the frequency spectrum of electrical noise generated by the wind turbine generators at locations surrounding the generator has been requested from the Applicant but not provided. In the absence of this information, the potential for the proposed wind farm to generate harmful interference and disrupt amateur radio communications in the KVWPP area is identified as an unresolved issue. Recommended measures for mitigating this potential impact are provided in Section 3.13, Public Services and Utilities.

1.8 SUMMARY OF IMPACTS AND MITIGATION MEASURES

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; and (3) mitigation measures either proposed by the Applicant or additional mitigation measures recommended in this EIS.

This environmental analysis addresses direct, indirect, and cumulative impacts for the proposed action. This section provides a summary of the analyses. 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 1-3, Summary of Impacts and Mitigation Measures, provides a synopsis of the environmental analysis for the proposed action 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 being proposed in Kittitas County that are being permitted through separate processes—Kittitas Valley and Wild Horse through EFSEC and Desert Claim through Kittitas County. The Kittitas Valley and Desert Claim projects are relatively close to each other (within 1.6 miles 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.

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 require similar amounts of construction 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 result in agate destruction.

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 within the shrub-steppe region. The combined figures for the three projects amount to approximately 275 to 300 total acres of existing vegetation lost, including 164 to 176 acres of shrub-steppe and at least 33 (and no more than 100, based on an estimate for Wild Horse) acres of lithosol habitat. In the context of the three wind power project areas that collectively cover approximately 17,000 acres, the approximate 2 percent 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. However, the precise regional extent of lithosol habitat is not quantitatively known. Therefore, 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 on wetlands could result from directly filling or grading of 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 between approximately 135 and 185 square feet of one small potential wetland system at the project site. Construction

activities would temporarily disturb approximately 16 acres of wetland area at the Desert Claim site, while the permanent project footprint would overlap with an area estimated at 9 acres. No wetlands were identified within a 164-foot buffer around the planned locations for Wild Horse project facilities; therefore, no impacts on wetlands are anticipated for that project. The collective effects of these projects would be minor as a result of wetland avoidance and/or required mitigation for wetlands that could not be avoided, and are not expected to extend to downstream surface waters or wetlands. Therefore, there would not be a potential for significant cumulative effects on wetland resources.

Wildlife

Some temporary displacement of wintering mule deer and elk is anticipated from winter construction activities in the three wind projects. If tolerance thresholds during wind power maintenance activities are exceeded, some animals are likely to be displaced and use areas away from the wind project development areas. However, cumulative impacts on wintering mule deer and elk for all projects are expected to be low.

The estimated combined raptor mortality rate for the three wind power projects would be approximately 14 raptor fatalities per year with 361 turbines, and 15 raptor fatalities per year with 391 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 use, one bald eagle fatality across all three projects might occur every two to three years. 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 430 to 740 fatalities per year. This level of mortality is not expected to have any population-level consequences for individual species.

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 361 to 782 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.

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 on-site or in downstream areas. Development of the Desert Claim project would result in minor disturbance or displacement impacts on streams and riparian zones in the project area; because none of the affected streams are known to contain fish communities, direct impacts on fish resources from this project are expected to be negligible or nonexistent. The effects of the respective projects would be negligible in three localized areas of the Kittitas Valley and would not extend to downstream waters, therefore there would not be a potential for significant cumulative effects on fishery resources.

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. 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.

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 two or all three of the projects overlapped. Even with implementation of strict fire protection and prevention measures, the cumulative risk of potential fires associated with construction of the three proposed wind turbine projects could remain significant.

Certain fire risks specific to wind energy projects would also exist during the operating period for each project. However, specific measures to counteract or manage these 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 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 approximately 540 to 545 MW of electricity (under the middle scenario for development of the Kittitas Valley project). Assuming long-term operation of the three projects at a typical plant factor of 33 percent, combined they would produce approximately 180 average MW of electricity on a long-term basis. That collective energy output would represent a substantial increase in the amount of electricity currently produced within Kittitas County. Operation of the three projects would also cumulatively add to the capacity, production, and availability of renewable energy sources in Washington State and the greater Pacific Northwest, and 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.

1.9.6 Land Use and Recreation

Development of the KVWPP concurrent with the proposed Desert Claim and Wild Horse wind projects would result in conversion of approximately 330 acres open space and rangeland uses in central Kittitas County for 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. The three projects would also require either Kittitas County approval for a rezone

and Comprehensive Plan amendment, or EFSEC review and governor approval, to allow development of a wind power facility. Temporary population increases associated with construction workers from all three projects could cumulatively increase demand for and use of local and regional recreation resources during overlapping construction periods.

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 all three projects 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.

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 and/or historic sites, as well as cause impacts on traditional cultural properties. Tribal representatives of the Yakama Nation have expressed concern about the cumulative effect wind power projects could have on tribal lands. Efforts to bring together wind farm applicants, government agencies, and tribal representatives to discuss these and other issues of concern are ongoing.

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.

1.9.10 Transportation

If construction occurs simultaneously for the Kittitas Valley and Wild Horse projects, the segment of I-90 immediately west of Exit 106 (to US 97) may temporarily carry construction traffic for both projects. The combined construction traffic volumes of both the Kittitas Valley and Wild Horse projects during the PM peak would cause this segment of I-90 to operate at level-of-service (LOS) B. This is 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 addition of the Desert Claim project, the total peak-hour trips if all three proposed projects were under construction simultaneously would result in an operating condition that is still within the numerical range for LOS B. Therefore, the additive effect of the potential Desert Claim construction traffic would not result in a significant cumulative impact on the operating condition for I-90 during the construction period. However, if turbine components or offsite gravel materials were delivered to multiple projects 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).

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.

The air emissions from contemporaneous construction of multiple wind projects 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 multiple 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 fuelled sources of power that would have otherwise been built or operated to produce an equivalent amount of electricity.

1.9.12 Noise

Construction noise generated by the three wind power projects 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. Given the distances that separate the Wild Horse project from the Desert Claim and Kittitas Valley sites, Wild Horse project operations would not contribute to cumulative noise impacts in the region.

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 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.

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

As described above under Issues to be Resolved, if the Office of Archaeology and Historic Preservation determines that (1) the boundaries of the Area of Potential Effect for visual impacts extends beyond the ground disturbance areas and (2) the North Branch Canal tunnel is an National Register-eligible historic resource, then there is the potential for the project to result in significant unavoidable indirect adverse impacts due to changes in the visual setting of this and other resources. The ability to avoid or mitigate this visual change would depend on the magnitude of this potential indirect impact. Should consultation with the Yakama Nation identify significant tribal resources at or near the project site, such as natural resource gathering, or history, cultural, and religious areas, there is the potential for the project to result in significant unavoidable direct or indirect adverse impacts due to construction or operation.

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. Flashing of lights on the tops of turbines would similarly be considered a significant unavoidable adverse impact. How adverse these impacts become depends on the viewer's location and sensitivity and the impact on view quality.

Table 1-3: Summary of Impacts and Mitigation

Alternative	Impacts	Mitigation Measures
3.1 Earth Resources		
Proposed Action	***Construction*** Impacts on soils from project construction would result from clearing, excavation, and filling activities. The largest volume of cut and fill and largest amount of imported materials would be required for the lower end scenario because it would require wider roads. The largest amount of exported materials would be generated under the upper end scenario because it involves constructing the largest number of turbines. Significant erosion would result from a combination of total site disturbance and cut and fill activities. Total site disturbance would range from 231 to 371 acres. Construction (cut and fill) of access roads in some areas could occur on or under relatively steep slopes, therefore, some sliding of soil and alluvial materials could be expected during construction. ***Operations and Maintenance*** No significant impacts on soils or topography, including soil erosion impacts, are anticipated during operation and maintenance of the project. Because Ellensburg Blue agate is not unique to the project site and because the majority of the site is presently restricted from legal public access, operations and maintenance activities are not expected to significantly preclude the public's ability to hunt for and collect this resource. A large earthquake could affect wind power operations, disrupt the regional electrical distribution system, or possibly cause turbine towers to collapse. However, the likelihood of catastrophic impacts is remote. The main hazard to the project site from volcanic eruptions would be from volcanic ash. Measures inherent in the project design and implementation of onsite emergency plans to protect the public health, safety, and environment on and off the project site would minimize potential impacts. Project facilities would not be located on unstable slopes or landslide-prone terrain. The turbine structures would be built on relatively flat ground (not on edges or slopes). The risk of seismic or precipitation-induced landslide in the soils and rock at the project site is minimal.	***Mitigation Measures Proposed by Applicant*** <u>Erosion Control during Project Construction</u> • Prior to beginning of construction, a detailed Stormwater Pollution Prevention Plan (SWPPP) would be developed and approved by EFSEC for the project to minimize the potential for pollutant discharge from the site during construction and operation activities. The SWPPP would include both structural and non-structural best management practices (BMPs). • The SWPPP would be prepared along with a detailed project grading plan by the Engineering, Procurement, and Construction (EPC) contractor when design level topographic surveying and mapping are prepared for the project site. • Site-specific BMPs would be identified on the construction plans for the site slopes, construction activities, weather conditions, and vegetative buffers. The sequence and methods of construction activities would be controlled to limit erosion. Clearing, excavation, and grading would be limited to the minimum areas necessary to construct the project. Surface protection measures, such as erosion control blankets or straw matting, also may be required during construction before site restoration if the potential for erosion is high. • All construction practices would emphasize erosion control over sediment control through such nonquantitative activities as using straw mulching and vegetating disturbed surfaces; retaining original vegetation wherever possible; directing surface runoff away from denuded areas; keeping runoff velocities low by minimizing slope steepness and length; and providing and maintaining stabilized construction entrances. • Erosion control measures to be installed during work on the access roads include maintaining vegetative buffer strips between the affected areas and any nearby receiving waterways; installing sediment fence/straw barriers on disturbed slopes and other locations shown in the SWPPP; using straw mulch at locations adjacent to an affected road; providing temporary sediment traps and Sedimat-type mats downstream of seasonal stream crossings; installing silt fences on steep exposed slopes; and planting affected areas with designated seed mixes.

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
	Decommissioning Decommissioning would consist of removing aboveground equipment such as turbine and meteorological towers and their associated foundations to a depth of 3 feet below ground. If the overhead power lines could not be used by the applicable utility (PSE or Bonneville), all structures, conductors, and cables would also be removed. The Applicant proposes to leave the underground electrical collection system in place subject to landowner approval. The substations could revert to the ownership of the applicable utility. At the time of decommissioning, the Applicant would consult with the applicable landowner to determine the appropriate disposition of the O&M facility. The soil surface would be restored as close as reasonably possible to its original condition. Reclamation procedures would be based on site-specific requirements and would include regrading, adding topsoil, and revegetating all disturbed areas.	<u>Erosion Control during Project Operations</u> • Operational BMPs would be adopted, as part of the SWPPP, to implement good housekeeping, preventive and corrective maintenance procedures, steps for spill prevention and emergency cleanup, employee training programs, and inspection and record keeping practices, as necessary, to prevent stormwater pollution. <u>Earthquakes</u> • Prior to final project design, a detailed geotechnical investigation and field survey would be performed to ensure that no turbine locations or other project components lie immediately above a high-risk fault. • The wind turbines would be equipped with vibration sensors that would automatically shut down the turbine in the event of a severe earthquake and current engineering standards applicable in Kittitas County (that is, the 1997 Uniform Building Code) would be used in the design of project facilities. • The Applicant would develop detailed emergency plans prior to project construction and operation to mitigate for potential hazards during an earthquake. <u>Volcanic Hazards</u> • In the event of damage from a volcanic eruption, the project facilities would be shut down until safe operating conditions return. • The Applicant would prepare onsite emergency plans to protect the public health, safety and environment on and off the project site in case of a major natural disaster such as a volcanic eruption. <u>Decommissioning Plans</u> • The Applicant would provide adequate financial assurances to cover all anticipated costs associated with decommissioning the project, including the costs of preparing and implementing a restoration plan, in the form of a rolling reserve account, using funds from the operation of the project, or a decommissioning surety bond. This plan, and the process for its funding, would be developed and submitted to EFSEC for review and approval prior to project construction.

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
No Action Alternative	Under the No Action Alternative, the project would not be constructed or operated and the impacts described above would not occur. For example, if the project is not developed, prospector access to Ellensburg Blue agate at the project site would remain unchanged. However, development by others, and of a different nature, including residential development, could occur at the project site in accordance with Kittitas County's existing Comprehensive Plan and zoning regulations. Depending on the location, type, and extent of future development at the project site, impacts on earth resources could be similar to or even greater than the proposed action. If long-term energy needs are to be met, a power generating facility would need to be built and operated at another location if the KVWPP is not built. This would likely be a gas-fired combustion turbine facility. It is estimated that a combustion turbine facility generating 60 average megawatts (aMW) of power could require approximately 14 acres for the plant site. However, gas-fired combustion turbine projects may result in greater disturbance of earth resources because of the possible need to establish a gas pipeline to the facility and electrical transmission interconnections; each facility would result in potential earth resources impacts. The specific type, nature, and extent of earth resource impacts under the No Action Alternative, such as erosion and risk of earthquakes and volcanic eruption, would depend on the site-specific location of the combustion turbine plant and its associated facilities.	
3.2 Vegetation, Wetlands, Wildlife and Habitat, Fisheries, and Threatened and Endangered Species		
Proposed Action	***Construction*** <u>Vegetation</u> Impacts during construction would involve direct disturbance to vegetation. Construction-related impacts on vegetation would be greatest under the upper end scenario, which would result in temporary habitat disturbance of 371 acres. Lithosol habitat is unique and sensitive and difficult to restore, therefore, loss of this habitat type would be considered an adverse effect of the project. Temporary disturbance to lithosol habitat would be greatest under the upper end scenario (approximately 150 acres) while permanent disturbance would be greatest under the lower end scenario (approximately 36 acres). Potential impacts on vegetation include colonization by invasive species, dust effects (i.e., particulate material coating plant leaves), and increased potential to ignite wildfires.	***Mitigation Measures Proposed by Applicant*** <u>Thorough Study and Analysis</u> • The Applicant has commissioned extensive studies by qualified biologists of plants and animals at the project site to avoid impacts on sensitive populations, including: rare plant surveys; habitat mapping; avian use surveys; aerial raptor nest surveys; wintering bald eagle surveys; non-avian wildlife surveys; biological assessment for threatened and endangered species; and stream and wetland surveys. <u>Project Design Features</u> • Avoiding when possible, construction in sensitive areas such as riparian zones, wetlands, forests, etc. • Minimizing new road construction by improving and using existing roads and trails instead of constructing new roads.

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
	<u>Wetlands</u> Road improvements would result in filling or grading up to 135 square feet of a wetland under the middle and upper end scenarios and 185 square feet under the lower end scenario. This potential impact would be greater for the lower end scenario due to the need for wider roads to accommodate for safe travel of larger cranes. <u>Wildlife and Habitat</u> The primary effect to wildlife from project construction would be the fragmentation, alteration, and removal of wildlife habitat. Overall, with implementation of proposed mitigation measures, impacts associated with project construction are not expected to result in a significant impact on native wildlife. <u>Fisheries</u> No direct impacts on fish associated with project construction would occur. Potential construction impacts on the stream channels, estimated at approximately 1,040 square feet under the middle and upper end scenarios and 1,245 square feet under the lower end scenario, are expected to be short term and negligible with proper management. <u>Threatened and Endangered Species</u> No rare plant species were identified in the KVWPP area; therefore, there would be no impacts during project construction. Bald eagles in the area during the construction period are unlikely to occur within the construction zones due to disturbances and therefore are unlikely to be at risk of construction-related mortality. In addition, most construction is likely to take place during late spring, summer and fall months when bald eagles occur rarely or not at all in the area. The possibility of mortality effects to other bird species with state or federal protected status is considered negligible and very unlikely. Some suitable habitat for white-tailed and black-tailed jackrabbits and Merriam's shrew would be lost to turbine pads and road construction, but overall total impacts on habitat are relatively small and no significant impacts on these species are expected to occur. Bat species would likely avoid construction activity and no disturbance to roosting habitat would occur.	• Choosing underground (versus overhead) electrical lines wherever feasible to minimize perching and electrocution hazards to birds. • Choosing turbines with low rotations per minute and using tubular towers to minimize risk of bird collision with turbine blades and towers. • Using bird flight diverters on guyed permanent meteorological towers or using unguyed permanent meteorological towers to minimize potential for avian collisions with guy wires. • Equipping all overhead power lines with raptor perch guards to minimize risks to raptors. • Spacing all overhead power line conductors to minimize potential for raptor electrocution. <u>Construction Techniques and BMPs to Minimize Impacts</u> • Using BMPs to minimize construction-related surface water runoff and soil erosion. • Using certified "weed free" straw bales during construction to avoid introduction of noxious or invasive weeds. • Flagging sensitive habitat areas (e.g., raptor nests, wetlands, etc.) near proposed areas of construction activity and designation of such areas as "off limits" to all construction personnel. • Developing and implementing a fire control plan, in coordination with local fire districts, to minimize risk of accidental fire during construction and respond effectively to any fire that does occur. • Establishing and enforcing reasonable driving speed limits during construction to minimize potential for road kills. • Properly storing and managing all wastes generated during construction. • Requiring construction personnel to avoid driving over or otherwise disturbing areas outside the designated construction areas. • Monitoring raptor nests on site for activity prior to construction and modifying construction timing and activities to avoid impacts on nesting raptors. • Designating an environmental monitor during construction to monitor construction activities and ensure compliance with mitigation measures.

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
	Suitable habitat for amphibians is very limited in the project area and no significant impacts on protected amphibian species are expected to occur. Construction activity may affect protected reptiles (striped whipsnake and sharptail snake) through loss of habitat and direct mortality of individuals occurring in construction zones. The level of mortality associated with construction would be based on the abundance of these species on site. No impacts on fish species would occur under the upper end, middle, or lower end scenarios. ***Operations and Maintenance*** <u>Vegetation</u> The project would result in permanent vegetation removal. The extent of impact would be greatest under the lower end scenario, which would result in permanent habitat disturbance of 118 acres. Operation impacts on vegetation communities would include shading associated with the turbine towers, as well as impacts caused by increased dust generated by travel on graveled roadways, potential changes in fire frequency patterns, and potential introduction of invasive species. <u>Wetlands</u> Project operations are not expected to have impacts on wetland resources if proper drainage, erosion-control plans, and stormwater management practices are implemented. <u>Wildlife and Habitat</u> Potential impacts on wildlife species associated with project operation include disturbance associated with vehicle traffic, avoidance of turbines, and collisions with turbines and meteorological towers. It is probable that some turbine avoidance effects may occur to the grassland/shrub-steppe avian species occupying the project area. The extent of these effects and their significance is unknown and hard to predict. Avoidance by avian species is expected to range from several hundred feet to no avoidance behavior. Impacts on avian species would be considered low.	<u>Post-Construction Restoration of Temporarily Disturbed Areas</u> • All temporarily disturbed areas would be reseeded with an appropriate mix of native plant species as soon as possible after construction is completed to accelerate the revegetation of these areas and to prevent the spread of noxious weeds. • The Applicant would consult with the Washington Department of Fish and Wildlife (WDFW) regarding the appropriate seed mixes for the project area. <u>Noxious Weed Control</u> • Cleaning construction vehicles prior to bringing them into the project area from outside areas. • Quickly revegetating habitats temporarily disturbed during construction. • Actively controlling noxious weeds that have established themselves as a result of the project. • Developing a noxious weed control plan prior to construction, and implementing the plan over the life of the project as mitigation. <u>Dust Control</u> • The Applicant proposes to implement a comprehensive dust control program. See Section 3.11, Air Quality, for a detailed description of mitigation measures to minimize fugitive dust emissions. <u>Fire Protection</u> • Prior to construction, a comprehensive fire control plan would be developed, and implemented project-wide over the life of the project. See Section 3.4, Health and Safety. <u>Monitoring and Adaptive Management Measures</u> • The Applicant proposes to convene a Technical Advisory Committee (TAC) to evaluate the mitigation and monitoring program and determine the need for further studies or mitigation measures. The role of the TAC would be to coordinate appropriate mitigation measures, monitor impacts on wildlife and habitat, and address issues that arise regarding wildlife impacts during construction and operation of the wind power project. The post-construction monitoring plan would be developed in coordination with the TAC and approved by EFSEC prior to construction.

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
	Operation of the proposed project would not affect raptor nests unless there were avoidance effects that caused raptors to not return to the nests close to the project site. Impacts would be considered low given the low density of nests observed in close proximity to the turbines and the species involved (red-tailed hawk). Based on the level of raptor use within the project area, raptor mortality is expected to be slightly higher compared to other wind projects with similar turbine types. Given that passerines make up the vast majority of the avian observations onsite, it is expected that passerines would make up the largest proportion of fatalities. Bat research at other wind power projects indicates that bat species are at some risk of collision with wind turbines, mostly during the fall migration season. It is likely that some bat fatalities would occur at the proposed project site. Due to the lack of knowledge regarding the potential impacts of wind energy development on big game, it is difficult to predict with certainty the project's effects on mule deer and elk. Given the amount of disturbance within the project area associated with existing residential development and roads, disturbance levels after project operation begins would not be greatly increased. No impacts are expected from the project to big game or reptile and amphibian movement or migration. Potential impacts on fish or fish habitat is unlikely due to the absence of potential fish habitat in the proposed project area. <u>Threatened and Endangered Species</u> Potential bald eagle mortality due to project operation would be confined to the winter and early spring seasons. Bald eagles are not expected to frequently occur within the project area and project operation should have minimal disturbance on bald eagles. The possibility of mortality effects to other federal and/or state protected bird species is considered very low or negligible. Some individuals of white-tailed and black-tailed jackrabbits and Merriam's shrew could be killed by vehicles on roads, but impacts should be minimal due to the limited nature of traffic expected within the project area.	• The TAC would evaluate the mitigation and monitoring program and determine the need for further studies and mitigation measures in accordance with the *Wind Project Habitat Mitigation Draft Guidance Document*. Based on a verbal agreement by the Applicant and WDFW coordinated in July 2003, three years of monitoring studies to evaluate impacts from project operations should occur. At the conclusion of these studies, an evaluation should be conducted with further mitigation measures determined, if needed. <u>Acquisition and Enhancement of Onsite Habitat</u> • The Applicant proposes to protect and restore replacement habitat for habitat temporarily and permanently disturbed by the project at an approximate 550-acre area between proposed turbine strings B and C. Overall, the parcel is in fair to good condition. However, there are several opportunities for enhancement at the mitigation parcel that would be expected to further raise habitat quality. These measures include implementing a grazing management plan and noxious weed control efforts, replanting shrubs in burned areas, and implementing a riparian replanting program. <u>Loss of Wetlands and Streams</u> • In August 2003, the Applicant submitted a Joint Aquatic Resource Permit Application (JARPA) to the U.S. Army Corps of Engineers and other applicable resource agencies to mitigate for the project's expected loss of jurisdictional wetlands and waters of the United States. Depending on the total project impacts and which Nationwide Permit the Corps assigns, EFSEC may require compensatory mitigation for the project. Therefore, the specific mitigation requirements to compensate for loss of wetlands and water resources at the project site is considered an issue of uncertainty that has yet to be resolved.

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
	Decommissioning Impacts on vegetation from decommissioning would be similar to but lower than impacts identified for construction, assuming that all access roads remain in place. Decommissioning vehicles would travel on established roadways, which would not impact vegetation, except for the possible introduction and/or spread of noxious weeds. Vegetation around project facilities (i.e., turbine, meteorological, and transmission towers) to be removed would likely be impacted to the same extent as described for construction. Potential impacts on wetlands resulting from decommissioning of the proposed project are unlikely. Impacts on wildlife and habitat, fisheries, and threatened and endangered species from decommissioning would be lower than during construction, assuming that all access roads remain in place. Dismantling the project would eliminate avian mortality caused by the presence of wind turbines. Wildlife habitat would have the potential to return to pre-project conditions over time; therefore, impacts from decommissioning would be low. Vehicles would travel on established roadways which would not impact habitat for federal or state protected species. Mitigation for impacts on wildlife would follow procedures in use at the time of decommissioning.	***Additional Recommended Mitigation Measures*** <u>Post-Construction Restoration of Temporarily Disturbed Areas</u> • Existing project design minimizes both permanent and temporary impacts from facilities construction. The Applicant proposes to reseed temporarily disturbed areas with an appropriate mix of native plant species as soon as possible after construction is completed (see Mitigation Measures Proposed by the Applicant, above). WDFW recommends that a broadcast application (4 to 6 pounds per acre) of a lithosol origin biotype such as native Sandberg Bluegrass should be applied to restored areas. <u>Acquisition and Enhancement of Onsite Habitat</u> • WDFW has encouraged the Applicant to avoid and minimize the impact on lithosols as much as possible. Lithosol habitat is difficult to restore. In lieu of direct avoidance, the following measure is recommended to minimize impacts on this unique and sensitive habitat: • Implement measures to protect and restore existing lithosol habitat along ridge tops in the mitigation parcel. The amount of area required to mitigate for temporary and permanent loss of lithosol habitat should be determined based on further consultation with WDFW. If the appropriate amount of lithosol habitat is not identified at the mitigation parcel, additional lithosol habitat should be identified and acquired for preservation. <u>Lighting</u> The following mitigation measures to reduce lighting effects on avian species are recommended by WDFW: • The use of lights on towers, in accordance with federal, state and local requirements, should be minimized whenever possible, because they may attract birds and bats to the vicinity of the turbines in certain conditions. Further, the US Fish and Wildlife Service recommends that only white (preferable) or red strobe lights be used at night, and that these should be the minimum number, minimum intensity, and minimum number of flashes per minutes (longest duration between flashes) allowable by the Federal Aviation Administration (FAA).

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
No Action Alternative	Under the No Action Alternative, the project would not be constructed or operated. However, development of a different nature could occur under Kittitas County's existing Comprehensive Plan and zoning regulations for the project area. Depending on the location, type, and magnitude of future developments at the project site, impacts on vegetation, wetlands, or to threatened or endangered plant and animal species could be similar to or even greater than the proposed action. However, potential impacts on birds would be expected to be less under the No Action Alternative assuming that no tower-like structures are constructed. Other power generation facilities would be constructed and operated in the region to meet the long-term need for power, most likely a gas-fired combustion turbine. Constructing a gas-fired turbine generator, developing and extracting natural gas, and constructing natural gas pipelines to provide fuel to the generating facility could create impacts on vegetation, wetlands, wildlife, and threatened and endangered species. The significance of such impacts would depend on the site-specific location and design of the facility.	
3.3 Water Resources		
Proposed Action	***Construction*** Precipitation during construction could result in sediment laden surface runoff because of ground disturbance and exposed soils. This impact would be greatest under the upper end scenario, which would result in the largest amount of ground disturbance during construction. Construction of the project would require water for road construction, concrete preparation, dust control, and other activities. The amount of water use during construction is not expected to be significant under any of the three scenarios because of the temporary nature of the impact and the availability of adequate water supplies. Encountering significant amounts of groundwater during construction of the turbine foundations is not expected. The overall impact on groundwater is expected to be temporary and unlikely to affect water wells in the project area. Because of the differences in depth between the majority of existing groundwater wells and proposed foundation sites, proposed blasting activities during construction are not anticipated to cause well damage.	***Mitigation Measures Proposed by Applicant*** <u>Surface Runoff Pollution during Construction</u> • The Applicant proposes to develop and implement, as required by the National Pollutant Discharge Elimination System (NPDES) General Stormwater Permit for Construction Activities, a detailed SWPPP to minimize the potential for discharge of pollutants from the site during construction. See Section 3.1, Earth Resources, for a detailed description of proposed SWPPP activities and measures to be implemented during construction. <u>Surface Runoff Pollution during Operations</u> • The Applicant proposes to develop and implement, as required by the NPDES Industrial Stormwater General Permit, a detailed SWPPP to minimize the potential for discharge of pollutants from the site during operations and maintenance activities. See Section 3.1, Earth Resources, for a description of proposed SWPPP activities and measures to be implemented during project operations and maintenance.

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
	Operations and Maintenance No significant erosion or sedimentation impacts on project-area surface waters are expected as a result of operation and maintenance of the KVWPP. This impact would be greatest under the lower end scenario, which has the largest permanent footprint. Operation of the project would require a domestic well to serve the limited needs of the O&M facility. No significant impacts on groundwater supplies are expected because of facility operations. ***Decommissioning*** Impacts on water resources and water quality from decommissioning of the project would be similar to those described for construction. Water would be needed for dust control. There would be potential for soil erosion and impacts on stormwater quality. Impacts are expected to be minimal, however, because appropriate construction BMPs would be followed during decommissioning.	<u>Water Supply</u> A licensed well driller would install a potable water well to serve the O&M facility. The well would be installed consistent with Kittitas County Environmental Health Department and Ecology requirements.
No Action Alternative	Under the No Action Alternative, the project would not be constructed or operated. However, development by others, and of a different nature, including residential development, could occur at the project site in accordance with Kittitas County's existing Comprehensive Plan and zoning regulations. Depending on the location, type, and extent of future developments at the project site, impacts on water resources could be similar to or even greater than the proposed action. If the proposed project were not constructed, the region's power needs could de delivered through development of other generation facilities, most likely a gas-fired combustion turbine. Gas-fired combustion turbine projects could expose more soil to potential erosion because of the possible need to establish a gas pipeline to the facility and electrical transmission interconnections. Also, substantial amounts of water, estimated at 200 acre-feet (65 million gallons) per year, would be needed for cooling water during plant operation. Operation of a water-cooled combustion turbine facility would also result in discharge of large volumes of wastewater.	

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
3.4 Health and Safety		
Proposed Action	***Construction*** There is a risk of unintentional or accidental fire or explosion during project construction. The highest expected fire risks are grass fires during the hot, dry summer season. Natural risk of unintentional fire or explosion, such as from a lightning strike would be the same regardless of project scenario. The potential fire risk from human activities would be greatest for the upper end scenario because this scenario would involve the greatest amount of activities such as ground disturbance (approximately 317 acres) and welding (on a per turbine basis) that could lead to accidental fire or explosion. Fuel and lubricating oils from construction vehicles and equipment are potential sources of hazardous materials that could accidentally leak or be spilled during project construction. Mineral oil used to fill substation transformers is another potential source of hazardous materials. ***Operations and Maintenance*** There is a risk of unintentional or accidental fire or explosion during project operations and maintenance. The risk of accidental fires from human activities such as cigarette smoking and use of vehicles off established roadways would be greatest during the upper end scenario due to the larger number of project employees. For mechanical fires, the frequency of this impact would be expected to be greatest under the upper end scenario, which would operate the largest number of turbines. Lubricating oils and hydraulic fluids used in the individual wind turbine generators and mineral oil used to fill pad-mounted and substation transformers are potential sources of hazardous materials that could accidentally be spilled during project operations. This potential impact would be greatest under the upper end scenario. Potential public health and safety risks caused by ice falling off rotating blades could occur within 50 to 328 feet of an operating turbine tower.	***Mitigation Measures Proposed by Applicant*** <u>General Measures to Protect Health and Safety</u> • The Applicant and its subcontractors would comply with all applicable local, state and federal safety, health, and environmental laws, ordinances, regulations, and standards. <u>Fire and Explosion Risk Mitigation Plan (Construction and Operations)</u> • All onsite service vehicles would be fitted with fire extinguishers. • Fire station boxes with shovels, water tank sprayers, etc. would be installed at multiple locations onsite along roadways during summer fire season. • A minimum of one water truck with sprayers would be present on each turbine string road with construction activities during fire season. • No gasoline-powered vehicles would be allowed outside graveled areas. • Mainly diesel vehicles (i.e., w/o catalytic converters) would be used on site. • High clearance vehicles would be used on site if used offroad. • Smoking would be restricted to designated areas (outdoor gravel covered areas). • Only state-licensed explosive specialist contractors would be allowed to perform blasting work. • Vegetation from the general footprint area surrounding the excavation zone to be blasted would be cleared. • Standby water spray trucks and fire suppression equipment would be present during blasting activities. • All equipment would be designed to meet National Electric Code and National Fire Protection Association standards. • Graveled areas with no vegetation would surround substations, fused switch risers on overhead pole lines, junction boxes, and pad switches.

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
	According to the Applicant, potential collapse of wind turbine towers or blade throw (i.e., blade fragments thrown from a rotating machine) are not anticipated, however, minimum setbacks incorporated into the project layout and compliance with engineering design and manufacturing safety standards would reduce these safety risks. Shadow flicker caused from low-angle sun shining through rotating wind turbines would affect several residences living in close proximity to the project site, and residents may perceive these effects to be significantly disruptive. The lower end scenario would result in greater shadow-flicker effects than would occur under the middle scenario. It is expected that although greater in number, the upper end scenario would exhibit fewer total hours of shadow-flicker and shorter durations than those predicted for the middle scenario because the length of shadow cast from a shorter tower would be smaller. The rotors would be located between 65 and 115 feet above ground level and ground level airflow disturbance (i.e., dust generation) would be negligible. The potential for vandalism of project facilities would be negligible due to site security measures incorporated into the project design. Electric and magnetic fields (EMF) generated by proposed overhead high-voltage equipment at the substations would diminish to background levels at nearby residences and would not pose a health or safety risk. The electrical system at the substations would be designed to minimize risks associated with ground faults, lighting, and switching surges that may result in high voltage hazards. ***Decommissioning*** Potential health and safety impacts during the project decommissioning process would be similar to risks identified during project construction.	• Fire suppressing rock filled oil containment troughs would be constructed around substation transformers. • Specially engineered lighting protection and grounding systems would be included at wind turbines and substations. • Footprint areas around turbines and substation would be graveled with no vegetation. • Generators would not be allowed to operate on open grass areas. • All portable generators would be fitted with spark arresters on exhaust system. • The immediate area surrounding any welder/torch activity would be wetted with a water sprayer. • Fire suppression equipment would be present at the location of welder/torch activity. • Electrical designs and construction specifications would meet or exceed requirements of National Electric Code and National Fire Protection Association. <u>Additional Measures to Reduce Risk of Fire and Explosion during Construction</u> • The Construction Manager would be responsible for staying abreast of fire conditions in the project area by contacting Washington State Department of Natural Resources (DNR) and implementing necessary fire precautions. • Fire risk reporting by the Washington DNR would be actively posted at the construction job site during the high-risk season. • A Fire Protection and Prevention Plan would be developed and implemented, in coordination with the Kittitas County Fire Marshall and other appropriate agencies. • Potential hazards associated with use of flammable liquids such as construction equipment fuels would be reduced by compliance with a Construction Health and Safety Plan. <u>Additional Measures to Reduce Risk of Fire and Explosion during Operations</u> • The Applicant has committed to developing and implementing emergency response procedures and employee training. • The project O&M group and third party contractors would receive regular emergency response and safety training to ensure that effective and safe action would be taken to reduce and limit the impact of an emergency (including fires and explosions) during project operations.

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
		• The wind turbine generators would be equipped with specially engineered lightning protection systems that connect the blades, nacelle, and tower to a grounding system at the base of the tower. The blades would be constructed with an internal copper conductor and an additional lightning rod that extends above the wind vane and anemometer at the rear of the nacelle. • The turbine control system would detect overheating in turbine machinery. Internal fires would be detected by these sensors, causing the machine to shutdown immediately and to send an alarm signal to the central Supervisory Control and Data Acquisition (SCADA) system which would notify operators of the alarm by cell phone or pager. • The proposed substations would be equipped with specially engineered lightning protection systems to minimize the risk of fire during substation operations. • Permanent meteorological monitoring towers would be installed with a grounding system that protects the meteorological sensors and loggers from electrostatic discharge and provides lightning protection to the tower. • Only qualified personnel would perform maintenance on the electrical cables. Sufficient clearance would be provided for all types of vehicles traveling under the overhead segments of the electrical lines. <u>Measures to Reduce Potential Releases of Hazardous Materials to the Environment during Construction</u> • To avoid spills, fueling trucks would be equipped with auto shut-off valves and other safety devices. The fuel trucks would be properly licensed and would incorporate features in equipment and operation, such as automatic shut-off devices, to prevent accidental spills. • The oil truck used to fill substation transformers would be properly licensed and would incorporate several special features in equipment and operation, such as automatic shut-off devices, to prevent accidental spills. • The details of how lubricating oils and other materials would be stored and contained at the construction staging area would be documented in a construction spill prevention and control plan developed and approved by EFSEC prior to commencement of construction. This plan would show storage, detention, and response procedures for all potential chemicals used onsite. • The EPC contractor would be responsible for compliance with applicable federal, state, and local laws, ordinances, regulations, and standards to ensure that the risk of release does not create an adverse health and safety or environmental impact. The EPC contractor would also be responsible for training its personnel in spill prevention and

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
		control. Spills would be addressed in accordance with the construction spill prevention plan. <u>Measures to Reduce Potential Releases of Hazardous Materials to the Environment during Operations</u> • The wind turbines would be equipped with sensors to automatically detect loss in fluid pressure and/or increases in temperature; these sensors would enable the turbines to be shut down in case of a fluid leak. The turbines would be designed with fluid catch basins and containment systems to prevent accidental releases from leaving the nacelle. The pad-mounted transformers would be designed to meet stringent electrical industry standards, including containment tank weldment and corrosion protection specifications. These transformers would also be equipped with oil level indicators to detect potential spills. • The substation transformers would have a specifically designed containment system to ensure that any accidental fluid leak does not result in discharge to the environment. • Waste fluids would be stored in appropriate containers on a concrete surface inside the O&M facility for collection by a licensed collection service for recycling or disposal. The storage area inside the O&M facility would be surrounded by a berm or trough to trap any leaks or spills. <u>Measures to Minimize Risk of Ice Throw</u> • The proposed turbines would be located at least 1,000 feet from any residences. For additional safety, selected turbine rows within 328 feet of public roads would also be equipped with a fail-safe icing sensor system, which would shut the turbines down and activate a local alarm during rare icing events. The affected machine(s) would remain dormant until icing conditions are no longer present. <u>Measures to Minimize Risk of Tower Collapse and Blade Throw</u> • The Applicant proposes setbacks of at least the height of the tower plus the blade (overall tip-height) from any public roads and residences. The size of this setback would vary depending on the selected project scenario. • The wind turbines would meet international engineering design and manufacturing safety standards. This includes tower, blade, and generator design. There is an international quality control assurance program for turbines, and a number of relevant safety and design standards.

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
		Measures to Minimize Exposure to EMF • Proposed high voltage transmission lines would be designed and built according to industry standards to avoid EMF impacts. Measures to Minimize Electric Shock • The substations would be designed and constructed to have a robust grounding grid that would divert stray surges and faults. Measures during Decommissioning • An audit would be performed of the relevant operation records and a project site survey would be conducted to determine if a release of hazardous material has occurred. A review of all facilities would be performed to determine if hazardous or dangerous materials (as then defined by regulation) are present as construction materials or materials used in the operation of any facility components such as cleaning and maintenance fluids, lubricating oils, and gases. The project site inspection would determine and record the location, quantity, and status of all identified materials. ***Additional Recommended Mitigation Measures*** In addition to the mitigation measures proposed by the Applicant above, the following measures would further reduce health and safety related impacts and risks. Measures to Minimize Risk of Ice Throw • The Applicant proposes to equip selected turbines within 328 feet of public roads with a fail-safe icing sensor system. However, some of the residents in the project area travel on private roads to access their properties. Because some roads appear to be close to the proposed turbines, the Applicant should install a similar icing sensor system on any turbine located within 328 feet of private roads.

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
		Measures to Minimize Risk of Tower Collapse and Blade Throw • The Applicant proposes setbacks of at least the turbine tip-height from public roads and residences as a safety measure to reduce the risk of tower collapse or blade throw. However, some of the residents in the project area travel on private roads to access their properties. Because some roads appear to be close to the proposed turbines, the Applicant should adjust the siting of individual turbines, as necessary, to avoid encroaching upon a 260- to 410-foot setback around private roads. Measures to Minimize Shadow Flicker Effects • Shadow flicker caused from low-angle sun shining through wind turbine rotors would affect several residences in proximity to the project site. Although the number of expected hours of exposure is relatively low, residents may perceive these effects to be significantly disruptive in nature. Recommended mitigation measures to minimize the nuisance effect from shadow flicker to residents in the project area should include one or more of the following: • Plant trees between the affected residence and the turbines causing the effect; • Install fixed shades on affected windows; • Install automatic shades on affected windows that are opened and closed by electric motor on a timer.
No Action Alternative	Under the No Action Alternative, the project would not be constructed or operated and the existing risk of fire caused by natural sources or human activities not associated with the project would remain. However, development by others, and of a different nature, including residential development, could occur at the project site in accordance with Kittitas County's existing Comprehensive Plan and zoning regulations. Depending on the location, type, and extent of future development at the project site, health and safety impacts could be similar to or even greater than the proposed action. However, the risks associated with tower collapse and detachment or failure of turbine parts would not occur if development other than a wind power project were proposed. It is assumed that a power-generating facility would need to be built at another location should the KVWPP not be built. This would likely be a gas-fired combustion turbine facility. An example of greater potential for health and safety risks associated with a gas-fired combustion turbine plant is the higher risk of fire or explosion associated with the transmission and use of large quantities of natural gas.	

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
3.5 Energy and Natural Resources		
Proposed Action	***Construction*** • Portable generators would produce the electricity required for construction activities. • Estimated fuel consumption during construction would be approximately 25,000 gallons (diesel and gasoline) under all three project scenarios. • Approximately five million gallons of water would be consumed for dust suppression and other construction purposes under the middle and upper end scenarios, while an estimated 6.4 millions gallons of water would be required under the lower end scenario due to a larger roadway footprint. • If lignin (a non-toxic, non-hazardous compound derived from trees) or another dust palliative is used, it is anticipated that between 2.0 million gallons (under the middle and upper end scenarios) and 2.6 million gallons (under the lower end scenario) of water would be required. • The estimated amount of steel required would range from 11,000 tons under the middle scenario to 13,000 tons under the upper end scenario. • The estimated amount of concrete required would range from 25,000 cubic yards (under the lower end scenario) to 35,000 cubic yards (under the upper end scenario). • The estimated amount of gravel required would range from 145,535 cubic yards under the middle scenario to 186,325 cubic yards under the lower end scenario. ***Operations and Maintenance*** • The project would generate between 287,979 to 390,315 megawatt hours (MWh) of electricity annually and would result in an increase in the availability of renewable energy in the Pacific Northwest, a beneficial effect. • The projected increased demand for electricity would range from 800 MWh per year under the lower end scenario to 875 MWh per year under the middle scenario. • Expected fuel consumption under all three scenarios is estimated to be about 8,500 gallons per year. • Project operations are expected to consume less than 1,000 gallon of water per day under all three scenarios.	***Mitigation Measures Proposed by Applicant*** • Use lignin (a non-toxic wood byproduct) as a dust palliative to reduce water consumption for dust suppression during construction; • Encourage carpooling of onsite construction crews; • Use high-efficiency electrical fixtures and appliances in the O&M facility and substation control house; and • Use low-water-use flush toilets in the O&M facilities.

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
	• Lubricating oils, hydraulic fluids, and other nonrenewable resources used to operate project equipment and to maintain the wind turbine generators would not result in impacts on the availability of these resources locally or regionally. ***Decommissioning*** Impacts attributable to energy consumption during project decommissioning would be similar to those described for the construction phase of the project. Energy consumption, predominantly in the form of gasoline, diesel fuel, and electricity, would be required to operate equipment such as cranes, trucks, tools, and vehicles used to dismantle and remove most project facilities and reclaim disturbed areas. Demolition or removal of equipment and facilities would occur, to the extent necessary, to salvage economically recoverable materials such as steel towers	
No Action Alternative	The No Action Alternative assumes that future development at the site would comply with existing zoning requirements for the project area, which is zoned Agriculture-20 and Forest and Range. Depending on the location, type, and magnitude of future developments at the project site, impacts on energy and natural resources could be similar to or even greater than the proposed action. If a 60 aMW natural gas-fired combustion turbine facility replaced the proposed wind turbine project, energy consumption impacts during both project construction and operations would increase substantially. Unlike wind, which is natural renewable energy source, a combustion turbine project of similar generating capacity would use substantial quantities of natural gas, a nonrenewable resource, as its primary energy source.	

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
3.6 Land Use and Recreation		
Proposed Action	***Construction*** Conflicts between proposed construction activities and existing grazing operations are anticipated, and cattle or other livestock would need to be removed from areas where blasting or heavy equipment operations are taking place. Construction impacts would be greatest under the upper end scenario because it would involve the largest amount of land use disturbance. Temporary impacts on private landowner-approved recreational activities such as hunting or rock hounding could occur during project construction. Potential conflicts between recreation users on DNR property and wind turbine construction activities could impair the use and enjoyment of recreational activities such as hunting and hiking in the project area. This impact would be greatest under the upper end scenario. Project construction would not likely have significant adverse direct effects on offsite recreation resources or their users. Furthermore, it is anticipated that there would be an adequate supply of recreational lodgings to accommodate the temporary increased demand for facilities by the project's transient workforce. ***Operations and Maintenance*** Proposed project facilities would result in the conversion of 93 to 118 acres of land from cattle grazing/rangeland to energy production. This potential impact would be greatest under the lower end scenario, which would have the greatest amount of land use conversion. Impacts on private landowner-approved recreation activities such as hunting or rock hounding could occur during project operations. However, these impacts are expected to be minimal. The presence of wind turbines on publicly accessible DNR property could impair the use and enjoyment of recreational activities in the project area.	***Mitigation Measures Proposed by Applicant*** • During project construction, it would be necessary to remove cattle from areas where blasting or heavy equipment operations are taking place. The Applicant proposes to make arrangements with property owners and livestock owners to keep livestock out of these areas during those periods. • After construction is completed, disturbed areas would be returned as closely as possible to their original state, excluding service and access roads, which would remain in place for the life of the facility. ***Additional Recommended Mitigation Measures*** • If DNR determines that potential conflicts between turbine construction and/or operations and existing recreational uses on DNR property would occur, the agency could take steps to limit access to its property. For example, DNR could post appropriate signs on its property limiting public pedestrian and/or vehicle access to portions of the project area during construction or operations.

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
	Operating wind turbines would be visible from the southern portion of the Wenatchee National Forest and from the John Wayne Trail but it is unlikely that views of the new wind turbines would have significant adverse impacts on the experience of recreational users in the project vicinity. Because of the small size of the operating work force, there would be no significant increase in the demand for recreational services and opportunities in the project area. ***Decommissioning*** If the KVWPP facility were decommissioned, temporary land disturbance of the type and magnitude described for project construction would be anticipated. Temporarily disturbed lands would be restored to their original condition through grading and planting. Upon decommissioning, land use impacts from facility operations would be largely reversible. No permanent land use impacts would result from decommissioning. Limited impacts on recreational activities on the site could occur during project decommissioning activities. However, once the site is reclaimed to pre-project conditions, recreational use in the affected area could resume.	
No Action Alternative	Under the No Action Alternative, the project would not be constructed and existing land and recreation uses in the project area would continue without the influence of the proposed project. The specific type, nature, and extent of future developments at the project site are unknown, and would depend primarily on county growth trends. The Kittitas County Comprehensive Plan and Zoning Code would govern development at the project site. Under the No Action alternative, the region's power needs could be addressed through development of a gas-fired combustion turbine. Such a combustion turbine facility would likely be developed on land zoned for industrial development of a similar type and nature. It is estimated that a combustion turbine facility generating 60 aMW of power would require approximately 14 acres for the plant site. To operate, gas-fired turbines may also require on-shore gas extraction and transportation of the gas to the power plant (via pipeline). Although the specific acreage requirements for these facilities as part of the No Action Alternative are unknown, these facilities could result in potential additional land use impacts. The specific type, nature, and extent of land use impacts under the No Action Alternative would depend on the location of the combustion turbine plant and its associated facilities.	

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
3.7 Socioeconomics		
Proposed Action	Differences between the socioeconomic impacts of the three project scenarios are summarized below to the extent information is available. Quantifiable estimates for employment and income effects in Kittitas County from the lower and upper end scenarios are not available at this time. Similarly, the potential effects on the local tax base under these two scenarios are not available. However, the employment, income, and tax revenue effects of the lower and upper end scenarios during construction and operations would be estimated at +/- 10 to 15% of the quantified middle scenario. ***Construction*** A maximum of 177 new workers would be temporary residents (in-migrants) in the project area under all three project scenarios. It is anticipated that there would be an adequate local housing supply available to accommodate project-related demand for temporary rental and short-term (transient) housing. The direct construction employment impact of the project would be approximately 253 new temporary jobs under all three project scenarios. The total number of direct construction jobs in Kittitas County would be 40 under the three project scenarios. Under the middle scenario, the total indirect and induced workforce associated with the construction stage of the project in Kittitas County is predicted to be 14 and 28 jobs, respectively. Construction jobs created by the project would result in short-term benefits to overall county and regional employment. Total income (direct, indirect, and induced) generated during the construction phase of the project (middle scenario) is estimated to be over $5.7 million (in 2002 dollars) in Kittitas County, a temporary but beneficial effect to the Kittitas County economy. ***Operations and Maintenance*** Project operation is projected to require between 12 to 14 full-time employees under the lower end and middle scenarios and between 18 to 20 full-time employees under the upper end scenario. It is estimated that approximately one-half of the total permanent workforce employed would be represented by local workers from Kittitas County. The projected increase in demand for local housing would be nominal and the permanent jobs created would result in long-term benefits to overall county employment.	No mitigation measures are required or have been identified for potential socioeconomic impacts.

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
	The comprehensive statistical analysis provided in the May 2003 study evaluating the correlation between wind development projects and nearby property values in the U.S. by the Renewable Energy Policy Project provides no evidence that wind development had harmed property values within the viewshed of the projects (defined as properties within 5 miles of the outermost turbines in a wind power project). Therefore, no long-term impacts on property values are expected as a result of the proposed project. During operations, it is estimated that 9 local workers from Kittitas County would be employed to operate and manage the wind project. The total indirect and induced employment impact during project operations (under the middle scenario) is predicted to be 1 and 13 jobs, respectively, for a total of 24 additional jobs in Kittitas County. The project (under the middle scenario) is also projected to result in nearly $2 million per year in added income in Kittitas County. Impacts from employment induced through a potential increase in local tourism are not considered to be significant, although local businesses are likely to experience increases in income. It is estimated that Kittitas County would receive an estimated total of $1,343,100 in added property tax revenue each year under the middle scenario. ***Decommissioning*** Upon decommissioning, if subsequent economic uses of the project site were not developed, facility closure would represent a long-term loss of employment and associated economic activity for the local and regional economy and a loss of tax base. However, the number of jobs eliminated would be small compared to the number of jobs in Kittitas County as a whole, therefore, a very minor adverse impact on County employment would be anticipated. If facilities were removed from the study area, property tax revenues would decrease accordingly. This loss of revenue would likely have a slight adverse impact on the local economy. Decommissioning would require removing most project facilities and reclaiming disturbed areas. These activities would result in beneficial but temporary employment similar to that projected for facility construction.	

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
No Action Alternative	Under the No Action Alternative, the project would not be constructed or operated and the region's socioeconomic conditions would remain unchanged from current patterns and trends. Local providers of transient housing and other goods and services would not experience temporary increases in demand for their facilities, and the County would not benefit from the tax revenues and employment opportunities resulting from the proposed project. If the project were not constructed, the region's power needs could be delivered through development of other generation facilities such as a gas-fired combustion turbine. Although the impacts of a combustion turbine would depend on its location, the specific socioeconomic impacts would likely be similar to the proposed project.	
3.8 Cultural Resources		
Proposed Action	***Construction*** Ground-disturbing activity during construction could potentially affect the two prehistoric archaeological sites recorded at the project site. The greatest potential for direct impacts would occur under the upper end scenario because it would involve the greatest extent of excavation activity. Tribal consultation with the Yakama Nation is ongoing. If significant resources are identified that would be directly or indirectly affected by the project, appropriate mitigation measures should be devised before construction begins. ***Operations and Maintenance*** No direct impacts on any known cultural resources would occur during normal operation and maintenance of the project. Project operations could lead to indirect impacts on potentially significant cultural resources in the project area. In particular, indirect impacts could involve the loss of integrity in the historic setting of the North Branch Canal tunnel caused by changes in the visual environment. However, the NRHP-eligibility status of the North Branch Canal tunnel, as well as the "area of potential effect" for indirect visual impacts, are presently unknown, therefore the potential for indirect impacts on cultural resources in the KVWPP area is identified as an unresolved issue.	***Mitigation Measures Proposed by Applicant*** • A qualified archaeologist would monitor the ground-disturbing activities; the Yakama Nation would be contacted prior to these activities and invited to have representatives present during all ground disturbances. If intact archaeological resources or human burials are encountered during construction, the construction foreman would immediately direct activities that could further disturb the deposits away from their vicinity. The construction foreman or Sagebrush Power Partners would then contact Dr. Robert G. Whitlam, Washington State Archaeologist, the Yakama Nation, and other pertinent parties who would determine how the materials should be treated. The area would be secured and placed off limits for anyone but authorized personnel. ***Additional Recommended Mitigation Measures*** • Because tribal consultation is on-going and cultural resources significant to the Yakama Nation may yet be identified, mitigation measures appropriate for these resources should be developed by the Applicant, and approved by EFSEC and the Yakama Nation, before construction begins. It is recommended that the Yakama Nation be involved in establishing procedures to be followed in the event of any unanticipated finds during the construction and decommissioning phases of the proposed project.

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
	Decommissioning Impacts from decommissioning of the project would be similar to those described for construction activities. The two recorded prehistoric sites at the project site should be avoided during facility removal to prevent any damage to the sites.	
No Action Alternative	Because no construction is proposed under this alternative, no impacts on cultural resources would occur, as long as land use in the project area remains the same. Other energy generation facilities would likely be constructed in the region and could cause impacts on cultural resources but specific impacts would depend on the location and design of the facility.	
3.9 Visual Resources		
Proposed Action	***Construction*** In close-up views, particularly those seen by travelers on the segment of US 97 that passes through the project site and those seen from the closest residences, the visual changes associated with the construction activities would be highly visible and would have a moderate to high visual impact. From more distant locations, the visual effects would be relatively minor and would have little or no impact on the quality of views. Some construction activities may occur during evening (dusk) or nighttime hours, and lighting may be needed. The effects of construction lighting would be temporary, lasting only during the specific activity period (for turbine erection, estimated at six months). ***Operations and Maintenance*** The project has the potential to create high levels of visual impact at several locations, including from vantages along US 97 and from the ridgelands east of US 97. The lower end scenario would have less potential for visual clutter yet would result in much larger scale elements in the landscape. Conversely, the upper end scenario would have greater potential to visually overload the landscape. The use of brown turbines (as opposed to gray) would accentuate the visibility of the turbines and corresponding visual impact in views where they are seen against the sky. White flashing (daytime) lights on turbine towers would be visible but not intrusive to viewers in the areas surrounding the project and are unlikely to create a high visual impact.	***Mitigation Measures Proposed by Applicant*** • During the construction period, active dust suppression would be implemented to minimize the creation of dust clouds. • When construction is complete, areas disturbed during the construction process would be restored to natural conditions. • The wind turbine towers, nacelles, and rotors used would be uniform in design throughout the project. • The turbines would have neutral gray finish to minimize contrast with the sky backdrop. Because the turbines are most frequently seen against the sky, particularly in close-range views where visual concerns are the greatest, the gray finish is the most effective choice for minimizing project aesthetic impacts. • A low-reflectivity finish would be used for all surfaces of the turbines to minimize the reflections that can call attention to structures in a landscape setting. • Because of the prevailing wind conditions and the high level of reliability of the equipment being used, the rotors would be turning approximately 80-85% of the time, minimizing the amount of time that turbines would appear to be not operating. • The small cabinets containing pad-mounted equipment that would be located at the base of each turbine would have an earth-tone finish to help them blend into the surrounding ground plane. • The only exterior lighting on the turbines would be the aviation warning lighting required by the FAA. The warning lighting would be the minimum required intensity to meet the current FAA standards. • Most of the project's electrical collection system would be buried.

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
	The flashing red lights would be a new visual element into the project area's nighttime landscape. They would be most noticeable within 1 mile of the project and are likely to have an adverse effect on views from residential properties in these areas. The proposed project facilities, including turbines, substation equipment, aboveground electrical collection system, and the O&M facility have the potential to be constructed of materials that could create a new source of glare in the project area. ***Decommissioning*** Decommissioning would consist of removing aboveground equipment such as turbines and meteorological towers and their associated foundations to a depth of 3 feet below ground. Wind turbine foundations greater than 3 feet below the ground surface would remain. The ground surface would be regraded to natural appearing contours and revegetated to a natural condition. A close examination of the sites for several years after decommissioning would reveal that the surface had been disturbed. The visual impact of aboveground facilities not removed during decommissioning would remain. During the decommissioning process, similar impacts on those experienced during construction would occur but to a lesser extent because less construction material would be removed than was delivered to the wind turbine sites.	• The 1.2 mile above-ground segment of the electrical collection system would include wood poles, low-reflectivity conductors and non-reflective insulators. The aboveground segment would be located along two sets of existing overhead high voltage transmission. • To the extent feasible, existing road alignments would be used to provide access to the turbines, minimizing the amount of additional surface disturbance required. Access road widths would be restricted to 20 feet in the middle and upper scenarios. The roads would have a gravel surface and would have grades of not more than 15% to reduce unsightly soil erosion. • The O&M facility would have a low-reflectivity earthtone finish to reduce visual contrast with the surrounding landscape. • The colors of the asphalt and gravel used for circulation and parking areas at the O&M facility would be selected to minimize contrast with the site's soil colors. • Outdoor night lighting at the O&M facility and substations would be the minimum necessary for safety and security. All lights would be shielded to reduce offsite light trespass. • All substation equipment would have a low-reflectivity neutral gray finish to reduce visual impact. • All insulators in the substations and on takeoff towers would be non-reflective and non-refractive. • The control buildings located at each substation would have a low-reflectivity earthtone finish. • The chain-link fences surrounding the substations would have a non-reflective, dark finish to reduce their contrast with the surroundings. • In the areas surrounding the O&M facility and substations, naturalistic groupings of indigenous trees and shrubs would be established to provide partial screening and to help visually integrate the facilities into the landscape. • An information kiosk and public viewing area would be constructed near the proposed O&M facility off Bettas Road. Signs would be provided to direct tourists to this viewing area. There is evidence from viewer survey results that people who have an understanding of the technology and characteristics of wind energy facilities are less likely to find views of turbines in the landscape as objectionable. ***Additional Recommended Mitigation Measures*** • Architectural compatibility with the region's agricultural building types would unify the O&M facility and potentially the substation with the surrounding landscape.

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
		• For wind turbines that would be viewed uphill within a 1-mile distance, planting natural-looking groups of native conifers should be explored as a means to reduce the overall impact. However, any attempt to screen or buffer views of the wind turbines should be carefully examined because the aesthetic impact of a failed attempt to screen the turbines could have more impact than no attempt at all. • Any attempt to camouflage or paint in a decorative way would make the turbines more noticeable and incongruous. The wind turbines should not be painted to match sky or ground surface colors because the sky and surface colors are constantly changing. • The wind turbines should not be installed on a foundation that is raised above natural (existing) grades. The grasses and other plants used in post-construction restoration efforts should continue to the base of the tower so that the tower is visually connected to the earth. • All wind turbines should be the same design, height, and color, and their blades should rotate in the same direction. The nacelles should have only one small logo visible on the two longest sides. Cellular dish-type antennas should not be attached. Narrow antennas could likely be added to the wind turbines with minimal aesthetic impact. • The towers should be constructed to house the transformer and any control panels within the base of the tower to avoid visual clutter. • To compensate for visual impacts, the Applicant should acquire conservation easements on land in important foreground views of the wind turbines so that no further development occurs in these areas until after decommissioning.
No Action Alternative	Under the No Action Alternative, the visual character of the project area would remain rural assuming that land uses would continue to follow recent trends and that no area-wide rezoning would occur in the near future. However, even under the current zoning, the rural character could slowly become more urban if large parcels are subdivided and residences are constructed on smaller lots. The demand for electrical power in the region would increase and some other energy production facility would likely be constructed elsewhere in the region. The visual impacts of another facility are not predictable and would range from incompatible to acceptable depending on the type and location of the facility.	

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
3.10 Transportation		
Proposed Action	***Construction*** Assuming gravel is imported from an offsite source located in or around Ellensburg or from another location(s) south of the project area, construction traffic generated by the lower end (i.e., worst case) scenario would result in LOS D operations on US 97 north of I-90 during the PM peak hour. However, the portion of US 97 north of I-90 most likely to experience LOS D conditions would be at or near the 4-way intersection of US 97 and Dolarway Road in the City of Ellensburg; this area is classified as an urban-principal arterial. Therefore, for the urban portion of US 97 north of I-90 the project's construction-generated traffic would not exceed the County standard of LOS D for urban areas. Assuming a peak workforce of 160 people, the worst-case scenario (assuming no carpooling) would require approximately 2 acres for parking. This parking area requirements would be the same under the three project scenarios. The EPC contractor would use fuel trucks to refuel construction vehicles and equipment onsite but there would not be significant safety risks associated with hazardous materials transport. Some of the construction delivery trucks would have a gross vehicle weight that would exceed the state's legal load limit, which in turn could degrade the condition of existing roadways in the project area. This potential impact would be greatest for the lower end scenario because it would require the greatest number of heavy duty truck trips. Given the magnitude of truck trips generated during construction, the additional traffic could temporarily increase the risk of accidents in the project area. Temporary construction equipment such as cranes and derricks that would be used to erect turbine towers could pose a hazard to aviation safety during the construction period. ***Operations and Maintenance*** All roadways would operate at LOS C or better during evening peak conditions. The proposed O&M facility parking lot may not be sufficient to accommodate future parking needs of both project employees and potential visiting tourists.	***Mitigation Measures Proposed by Applicant*** <u>Construction Traffic Control</u> • The Applicant would prepare a Transportation Management Plan (TMP) that would be reviewed and approved by the Washington State Department of Transportation (WSDOT) and Kittitas County. The TMP would direct and obligate the contractor to implement procedures that would minimize traffic impacts; • The TMP would include coordination between project-related construction traffic and WSDOT planned construction projects; • Any oversize or overweight vehicles would comply with applicable state and county requirements, as permitted by WSDOT and Kittitas County. • The Applicant would provide notice to landowners when construction takes place to help minimize access disruptions; • The Applicant would provide proper road signs and warnings of "Equipment on Road," "Truck Access," or "Road Crossings"; • When slow or oversized wide loads are in transit to and from the site, advance signs and traffic diversion equipment would be used to improve traffic safety. Pilot cars would be used as WSDOT codes dictate depending on load size and weight. Permits would be obtained for these oversized or overweight vehicles as required by WSDOT and Kittitas County; • The Applicant would construct necessary site access roads and entrance driveways that would be able to service truck movements of legal weight; • The Applicant would encourage carpooling for the construction workforce to reduce traffic volume; • In consultation with Kittitas County, the Applicant would provide detour plans and warning signs in advance of any traffic disturbances; • The Applicant would employ flaggers as necessary to direct traffic when large equipment is exiting or entering public roads to minimize risk of accidents; • One travel lane would be maintained at all times. <u>Hazardous Materials Transport</u> • Transportation of hazardous materials would be conducted in a manner that protects human health and the environment and is in accordance with applicable federal and WSDOT requirements.

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
	During project operations waste fluids would need to be changed infrequently, and therefore would not result in a safety risk associated with hazardous materials transport. Vehicles used during operations and maintenance of the proposed project would consist primarily of employees commuting to and from the site and are not expected to be in excess of state or county legal roadway load limits. Projected traffic volumes during project operations could result in increases in the number of accidents at the intersection of US 97 and Bettas Road. This potential impact would be greatest under the upper end scenario because it would involve the greatest number of trips. The FAA reviewed plans for the proposed project (under the middle scenario) and concluded that the project would not interfere with aviation operations. Because the lower and upper end scenarios would operate using a different number and size of equipment, the FAA would be notified of these changes. Turbine maintenance roads would be available for the use of the fee owners of the affected parcels. The Applicant would also provide a master key to local emergency responders to allow access to all project maintenance roads. Tourists would probably visit the project area. However, the magnitude of vehicle trips that would be associated with the project as a tourist attraction is unknown. In the absence of specific data, the specific environmental effects of tourism are considered an issue of uncertainty that has yet to be resolved. ***Decommissioning*** Impacts from decommissioning activities would be similar to those for construction. However, assuming that the roadways would remain in place, heavy vehicle trips would consist primarily of trucks carrying wind turbines and transformers and the resulting workforce and vehicle trips would be smaller. Mitigation at the time of decommissioning would be implemented, and would likely be similar to that recommended for construction.	<u>Access Road Construction</u> • The access road from US 97 would be constructed with slopes and culverts designed according to WSDOT and Washington State access management standards under Title 468 WAC and Chapter 47.50 RCW. Access from county roads (Bettas or Hayward) would also be constructed with the appropriate slopes and culverts in accordance with Kittitas County standards. <u>Roadway Maintenance</u> • The Applicant proposes to upgrade the northern portion of Hayward Road prior to construction to allow passage of heavy equipment and trucks and to restore this portion of Hayward Road to a condition equal to or better than its present condition after construction is completed. • The Applicant would consult with the Kittitas County Department of Public Works to determine the specific requirements for any improvement and restoration to Hayward Road (and any other county roads used by the project.) • The Applicant proposes to take responsibility for ongoing maintenance to the northern portion of Hayward Road that is necessitated by the project's operation. Assuming the County chooses to keep Hayward Road closed for the winter, the Applicant would coordinate with the County to keep non-project vehicles off this road during the closure period. • The Applicant plans to submit an Application for Proposed Use of right-of-way (ROW) to Bonneville for joint use of the one mile section of ROW between Hayward Road and the proposed Bonneville substation and turbine string E. The Applicant proposes to upgrade this section of ROW from dirt to gravel surface and to assume responsibility for its maintenance. <u>Tourism-Induced Traffic</u> • The Applicant proposes to construct an information kiosk and public viewing area near the proposed O&M facility off Bettas Road. Signs would be provided to direct tourists to this site.

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
		Additional Recommended Mitigation Measures <u>Construction Traffic Control</u> • The Applicant should consult and coordinate with WSDOT and Kittitas County to identify additional temporary measures that could be implemented to improve LOS along US 97 north during the construction period. <u>Parking</u> • The Applicant should monitor the volume of tourists visiting the proposed viewing area to determine if overflow parking is required. If additional parking is needed, the Applicant could identify and create an adjacent overflow parking area. The specific location of an overflow parking area should be sited so that tourist traffic does not conflict with employee access into and out of the O&M facility, and no additional environmental impacts are caused. <u>Traffic Safety</u> • WSDOT would monitor the incidence of traffic accidents at the intersection of US 97 and Bettas Road. If, within a five-year time period, WSDOT determines that channelization improvements at the intersection of US 97/Bettas Road are necessary to reduce accidents caused by additional turning traffic, the Applicant should be responsible for all costs associated with the safety improvement. The safety improvement would be limited to a northbound left-turn lane, a southbound right-turn lane, or both. The time period for monitoring would begin at the time of development approval. <u>Aviation Safety</u> • If the Applicant's final proposal differs from the proposal submitted to, reviewed, and approved by the FAA in terms of number, siting, or size of proposed turbines, the Applicant should notify the FAA of these changes and secure any additional "Determinations of No Hazard to Air Navigation," as warranted.

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
No Action Alternative	The No Action Alternative assumes that future development would comply with existing zoning requirements for the project area, which is zoned Agriculture-20 and Forest and Range. It is estimated that during the peak hour in 2004, all roadways in the project vicinity would function at LOS C or better without the project. Constructing a power generation facility other than the proposed project could have transportation impacts. The intensity and significance of transportation impacts would depend on the design and location of the generation facility.	
3.11 Air Quality		
Proposed Action	***Construction*** Heavy trucks and construction equipment powered by gasoline and diesel engines would generate carbon monoxide (CO), hydrocarbons, nitrogen oxides (NOx), and particulate matter in exhaust emissions. Construction would also create fugitive dust emissions from construction-related traffic and additional wind-blown dust as a result of ground disturbance. The Applicant proposes to secure gravel from local off-site quarries, resulting in heavy truck transportation of materials to the project site. Impacts from construction vehicle emissions would be greatest under the lower end scenario because it would require transporting the largest amount of gravel to create gravel-compacted road surfaces. However, impacts from construction vehicle emissions would be greatest under the upper end scenario if gravel were imported from the existing permitted quarry just north of turbine F-1 because it would require transporting the greatest number of pieces of turbine components to the project site. Fugitive dust emissions due to ground disturbance would be greatest under the upper end scenario. ***Operations and Maintenance*** During project operations, travel on the new and upgraded private gravel access roads would generate limited amounts of fugitive dust and CO, hydrocarbon, NOx, and particulate matter emissions. The number of vehicle trips associated with workers commuting to and from the O&M facility on paved state and county roads would range from 28 to 40 daily trips. This impact would be expected to be greatest under the upper end scenario because it would consist of the largest number of turbines (150) that would require maintenance and would generate the largest number of daily commuter vehicle trips (40).	***Mitigation Measures Proposed by Applicant*** • All vehicles used during construction would comply with applicable federal and state air quality and vehicle emission regulations; • Operational measures such as limiting engine idling time and shutting down equipment when not in use would be implemented; • Active dust suppression would be implemented on unpaved construction access roads, parking areas and staging areas, using water-based dust suppression materials in compliance with state and local regulations; • Traffic speeds on unpaved access roads would be kept to 25 mph to minimize generation of dust; • Carpooling among construction workers would be encouraged to minimize construction-related traffic and associated emissions; • Disturbed areas would be replanted or graveled to reduce wind-blown dust; and • Erosion control measures would be implemented to limit deposition of silt to roadways.

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
	The proposed project would not generate regulated air pollutants. The specific process of generating electricity with wind turbines does not produce air emissions because no fuel is burned to produce energy. Although operation of the proposed wind turbines themselves would not produce emissions, the project could still contribute to generation of greenhouse gas emissions taking into consideration its "total fuel cycle," which includes the processes of manufacturing and transporting project parts and equipment. The actual effect on global warming caused solely by project emissions, either from fabrication, transport, construction, or operations, is unknown. However, the project would likely displace emissions from other sources of power generation such as coal or natural gas-fired power plants that would have otherwise been built or operated to produce an equivalent amount of electricity. ***Decommissioning*** Potential air quality impacts during project decommissioning would be similar to those described for construction. However, access roads may be left in place so impacts could be lower.	
No Action Alternative	The No Action Alternative assumes that future development at the site would comply with existing zoning requirements for the project area, which is zoned Agriculture-20 and Forest and Range. The specific type, nature, and extent of future developments at the project site are unknown, and would depend primarily on county growth trends. It is assumed that if the proposed project were not built, a natural gas-fired turbine facility generating 60 aMW would replace the power that would have been produced by the proposed project. Estimated carbon dioxide emissions from such a facility would be in excess of 2,000,000 tons per year, nitrogen dioxide emissions would be in excess of 30 tons per year, and CO emissions would be in excess of 50 tons per year.	

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
3.12 Noise		
Proposed Action	***Construction*** Noise generated by construction equipment is expected to vary, depending on the construction phase. Temporary blasting noise impacts would be greatest under the upper end scenario because it would require constructing the largest number of wind turbines. Due to the intermittent and temporary nature of proposed construction activities and the distance of the project site from residents, noise from these activities would not be expected to substantially impair nearby residential land uses. Construction vehicles traveling on local roadways and other nearby roads would temporarily increase noise levels. This potential noise impact would be greatest under the lower end scenario because it would result in the greatest number of PM peak-hour trips and total heavy duty truck trips. However, this would be temporary and is not anticipated to be an adverse impact. ***Operations and Maintenance*** Assuming a turbine sound power level of approximately 103 dBA, noise modeling results indicate that noise levels during project operations would be below the most restrictive nighttime regulation of 50 dBA under the middle scenario. However, given that a sound power level between 98 and 108 dBA is representative of the range of turbine noise test data for turbines under consideration for the project, the estimated noise levels at structures and property lines could be +/- 5 dBA, which could, in turn, exceed regulatory thresholds. It is anticipated that noise levels from the upper and lower end scenarios would be similar to the modeled middle scenario. There are no state or Kittitas County regulatory limits regarding an allowable increase above background noise levels caused by industrial projects. However, there is the possibility that changes in background noise levels could be perceived as adverse depending on the magnitude of that change and the nature of the receptor. Corona noise associated with operation of proposed high-voltage transmission lines at the substation sites is not expected to pose a significant noise impact.	***Mitigation Measures Proposed by Applicant*** • Substation transformers and high-voltage switching equipment would be specified or designed to comply with the 70 dBA limit at all Class C environmental designation for noise abatement (EDNA) property lines and 50 dBA at all Class A EDNA structures. ***Additional Recommended Mitigation Measures*** <u>Construction</u> • Implement work-hour controls so that noisy activities occur between 7 a.m. and 10 p.m., which would reduce the impact during sensitive nighttime hours. • Maintain equipment in good working order and use adequate mufflers and engine enclosures to reduce equipment noise during operation. • Turn off engines when not in use to eliminate needless engine idle noise. • Locate stationary equipment away from receiving properties to help reduce the noise through increased distance between source and receiver. • Organize construction vehicle travel to reduce the times passing by sensitive receivers. • Schedule noisy activities to occur at the same time since additional sources of noise generally do not add a significant amount of noise. • In the most severe case of construction noise, use temporary noise barriers or curtains to reduce noise from stationary equipment or activities located near sensitive receivers. <u>Operations and Maintenance</u> Prior to construction, an acoustical analysis of the final turbine layout should be prepared for all wind turbines to be located within one mile of an existing residence prior to project construction. The analysis should be conducted using noise level data for the final turbine type, size, and layout and would demonstrate compliance with the WAC (173-60). If compliance is not demonstrated, turbines should be relocated or removed, to the extent necessary, so that the project meets applicable regulatory thresholds.

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
	The projected minor increase in traffic along US 97 and project access roads during project operations would not be expected to generate substantial adverse noise effects. The proposed project would not result in any significant impacts from ground-borne vibration. ***Decommissioning*** Decommissioning activities would be similar in type but shorter in duration compared to those anticipated for the construction phase. Noise generated during decommissioning activities would be conducted between 7 a.m. and 10 p.m. No blasting would be required, resulting in lower noise levels than for construction. The same mitigation measures recommended during construction could also be used during the decommissioning phase.	
No Action Alternative	The No Action Alternative assumes that future development at the site would comply with existing zoning requirements for the project area, which is zoned Agriculture-20 and Forest and Range. If the project is not constructed, it is likely that the region's need for power would be addressed by developing a gas-fired combustion turbine. Both the construction and operational impacts of a gas-fired combustion turbine are more noise-intensive than the proposed wind generation project. Construction impacts from a conventional gas turbine plant can exceed 110 dBA at 100 feet during steam blowdown activities, and operational noise levels can exceed 80 dBA at 100 feet. The noise impacts of a gas turbine generator would depend on its location and design. In some settings, it could be considered highly incompatible with the existing environment; however, in the appropriate location, noise impacts could be minor.	
3.13 Public Services and Utilities		
Proposed Action	***Construction*** <u>Law Enforcement</u> There likely would be additional calls for response from law enforcement agencies during the construction phase, primarily because of increased traffic and accident potential. Other law enforcement concerns during construction include construction site security against theft and vandalism. This impact would be similar under the three project scenarios because the level of construction employment is expected to be the same. However, because the construction period is short, the increased service calls are not anticipated to be sufficient in number to require additional law enforcement staff resources in the project area.	***Mitigation Measures Proposed by Applicant*** <u>General</u> • Tax revenues generated by the Applicant's project would mitigate potential impacts to public services and utilities. Should there be construction impacts requiring additional staffing levels during construction or other impacts or costs related to services that would not be covered in a timely manner by tax revenues, the Applicant would enter into agreement(s) with the appropriate local governmental agency for prepayment of taxes for mitigation of the cost impacts. This would include fire, police, and county roads. • If emergency fire protection services are required during project operations prior to having an agreement in place, local fire officials

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
	Fire Protection Project construction could temporarily increase the risk of fire at the project site and in the broader project area. This risk would be greatest for the upper end scenario. Fire District No. 1's ability to provide adequate fire protection services would be restricted by the unimproved condition of the southern portion of Hayward Hill Road. Another concern is its ability to provide emergency rescue services to project personnel working on the wind turbines. The County Fire Marshall has raised the concern that the demand for fire protection services would occur before project tax revenues are realized, resulting in a temporary negative fiscal impact to the fire districts. Emergency Medical Services The local demand for emergency medical services (EMS) could increase slightly due to construction accidents that could occur at the project site or vicinity. The specific level of demand for EMS response is unknown, but it would be expected to be similar under the three potential project scenarios. Schools There would be no significant impacts to school facilities expected during the construction phase of the project. Water Supply The lower end scenario would generate the largest temporary increase in water demand. However, this impact would not be significant under any of the three project scenarios due to the temporary nature of the impact and the availability of adequate water supplies. Wastewater No significant impacts to community wastewater disposal systems are anticipated because the project would not be connected to a sewer system during construction.	informed the Applicant that the costs of these services could be billed to the project on a cost-recovery basis. • The Applicant would provide all local police, fire, and emergency medical agencies with emergency response information for the project including employee contact information, procedures for rescue operations to the nacelles, and location of rescue basket. Law Enforcement • The Applicant would consult with the county regarding the impact on county law enforcement staffing. If additional staffing is required, the Applicant proposes to mitigate by prepaying taxes in a sufficient amount to provide adequate staffing levels during construction. • A full time security plan would be implemented during project construction to reduce the potential need for increased police services to the project site. • The plant operations group would prepare a detailed security plan to protect the security of the project and project personnel. Site visitors including vendor equipment personnel, maintenance contractors, material suppliers, and all other third parties would require permission for access from authorized project staff prior to entrance. Fire Protection • Fire risk potential is constantly tracked and reported during the summer fire season by the DNR; fire danger levels would be actively posted at the construction job site during the high-risk season. • The construction manager would be responsible for monitoring fire conditions in the project area by contacting Washington DNR and implementing necessary fire precautions. A Fire Protection and Prevention Plan would be developed and implemented, in coordination with the Kittitas County Fire Marshall and other appropriate agencies. • All turbines and towers and the substations would be built with engineered lightning protection systems and the footprint areas around these facilities would be graveled with no vegetation. • All onsite operations employees would be responsible for contributing to ongoing fire prevention in the project area. • Onsite emergency plans would be prepared for the project in case of a major natural disaster or accident relating to or affecting the project. The plans would describe the emergency response procedures to be implemented during various emergency situations that may affect the project or surrounding community or environment.

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
	Solid Waste There is adequate capacity in the Ryegrass Landfill to accommodate the anticipated amount of construction and demolition debris generated under all three project scenarios. Garbage generated by construction workers in the project area would not have a significant impact on the capacity of the Greater Wenatchee Regional Landfill. ***Operations and Maintenance*** Law Enforcement Project operation would not be expected to have a significant effect on local long-term demands for law enforcement services. Fire Protection Impacts from fire, either from turbine nacelles due to mechanical failures or wildland fire at the project site, could increase or be more difficult to control unless provisions are made for fire fighters to have easy access to the project site. For mechanical fires, this impact would be expected to be greatest under the upper end scenario, which would operate the largest number of turbines. For wildland fires, this impact would be expected to be greatest under the lower end scenario, which would disturb the greatest amount of land. Emergency Medical Services Project operation would not have significant impacts on emergency medical service providers. Schools Because enrollment capacity is available in the region, no operational impact to local schools is expected. Water Supply No significant impacts to water supply are anticipated because the project would not be connected to a public water utility, and would have its own source of water. Wastewater No significant operational impacts on wastewater services are anticipated.	• The Applicant would also be responsible for the following fire protection and prevention measures: - Contract with fire district(s) for protection services during construction; - Provide special training to fire district personnel on how to respond to fires related to wind turbines, and to EMS personnel in how to use a rescue basket that would be kept at the O&M facility for the purpose of removing injured employees from the towers; - Provide detailed maps that show all access roads to the project; - Provide keys to a master lock system that would enable emergency personnel to unlock gates that would otherwise limit access to the project; - Use spark arresters on all power equipment, e.g., cutting torches and cutting tools; - Inform workers at the project site of emergency contact phone numbers and train them in emergency response procedures; - Carry fire extinguishers in all maintenance vehicles; and - Coordinate with DNR when the fire danger is high. Emergency Medical Services • Onsite emergency plans would be prepared to protect the public health, safety and environment on and off the project site in the case of a major natural disaster or industrial accident relating to or affecting the project. • In the event that operations personnel are seriously injured and require evacuation from a remote location within the project area, the Applicant would make arrangements with the Kittitas Valley Community Hospital for helicopter transportation service. Schools • Approximately $5.6 million dollars would be generated by the project and diverted into a state trust fund for school construction over the life of the project. This funding could be used to help offset the capacity issues being faced by the local school districts. Water Supply A licensed well contractor, in compliance with the requirements and standards of Chapter 173-160 WAC (Department of Ecology Minimum Standards for Construction and Maintenance of Wells) would install the domestic water well.

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
	Solid Waste There is sufficient existing capacity at the local transfer stations to accommodate increased solid waste under project operations. Communication Systems *Microwave Communication Pathways* It is not known how the location and dimension of turbines under the lower or upper end scenarios would affect microwave paths in the project area. *Television Reception* Television systems that operate at higher frequencies, such as satellite receivers, are line-of-sight systems, and physical interference from the turbine towers or blades could degrade television reception, particularly in the Swauk Prairie portion of the project area. *Cell Phone Interference* Degradation of existing cell phone service resulting from the project is unlikely. However, the location of the cell phone user relative to the existing cell phone antennae and project turbines could possibly affect the quality of service at specific receiving locations. *Radio Interference* To date, information regarding the frequency spectrum of electrical noise generated by the wind turbine generators at locations surrounding the generator has been requested from the Applicant, but has not yet been provided. In the absence of this information, the potential for the proposed wind power project to generate harmful interference and disrupt radio communications is identified as an unresolved issue.	Wastewater • The Applicant would coordinate with Kittitas County and comply with the county's septic tank and subsurface disposal field design, installation, and maintenance requirements for systems with designed flows of less than 3,500 gallons/day pursuant to Kittitas County Code Title 13.04. Communications Systems • Once the specific location and configuration of the turbines is identified on paper, the Applicant proposes to conduct final field measurement test surveys of communication microwave paths. If the results of these final surveys identify that the proposed turbines would interfere with or obstruct communication microwave paths, the Applicant would adjust the tower location, accordingly, to avoid line-of-sight interference. • The Applicant plans baseline field studies to more precisely determine the existing quality of television reception in the Swauk Prairie prior to construction of the project. After the project is built, the Applicant plans follow-up field studies to determine if the quality of television reception could be degraded by project operations. In the event that the project creates significant television reception problems for residents in this area, the Applicant would consult with affected residents to develop an appropriate solution. ***Additional Recommended Mitigation Measures*** Fire Protection Additional mitigation measures recommended by the County Fire Marshall but not specified by the Applicant include the following: • Comply with equipment rules and regulations required by DNR for work conducted in wildland/forested lands (e.g., fire extinguishers and shovels would be required on each piece of equipment); • Limit parking areas for vehicles; • Provide garbage containers; and • Implement restrictions on burning.

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
	Decommissioning Potential fire risks and fire prevention measures associated with decommissioning are similar in nature to those for project construction. Anticipated effects on provision of other public services and utilities would be expected to be similar to those described for during project construction. Any solid waste generated during the facility shutdown or decommissioning process would be disposed of, as necessary, to comply with Kittitas County solid waste regulations.	In addition, the following mitigation measure is recommended to further reduce the potential for wildland fires during project construction: • Implement the terms of any negotiated agreements between Fire District No. 1 and the Applicant regarding improvements to the southern portion of Hayward Hill Road to ensure adequate fire protection to the project area. <u>Communication Systems</u> If the Applicant's follow-up studies determine that the project creates significant television reception problems in the area, one of the following mitigation measures to minimize television interference impacts should be implemented by the Applicant: • Improve the receiving antenna system; • Install a remote antenna; • Install an antenna for TV stations less vulnerable to interference; • Connect affected residents to an existing cable system; or • Connect affected residents to an existing satellite system. To reduce the impact of potential cell phone degradation in the project area, the Applicant should implement the following mitigation measures: • The Applicant should conduct a field study before and after project construction to determine if the quality of cell phone service in the project area is degraded by project operations. • If cell phone degradation is identified as a result of project operations, the Applicant should be responsible for implementing appropriate mitigation to minimize impacts. This could include developing and funding a program under which the cell phone service provider would establish new antenna locations to ensure continued high-quality reception and transmission. These locations could include the wind turbine generator towers or other locations as determined by the cell phone service provider.

Table 1-3: Continued

Alternative	Impacts	Mitigation Measures
		Regarding the potential impact of radio interference in the project area, the Applicant should implement the following mitigation measures: • Prior to construction, but after the final turbine make, model, and size and site configuration have been selected, the Applicant should provide data regarding the frequency spectrum of electrical noise generated by the wind turbine generators at locations surrounding the generator similar to those made for audible noise emissions. The Applicant should then compare this frequency spectrum with frequency spectrums from existing, operating radio communication devices in the project area to identify if potential harmful interference could occur. • If radio interference is identified as a potential impact, mitigation could be accomplished by reducing the amount of noise generated or by screening the electrical equipment to prevent radiation of unwanted frequencies.
No Action Alternative	Under the No Action Alternative, the project would not be constructed or operated. However, development by others, and of a different nature, including residential development, could occur at the project site in accordance with Kittitas County's existing Comprehensive Plan and zoning regulations. Depending on the location, type, and magnitude of future development at the project site, impacts to public services and utilities could be similar to or even greater than the proposed action. If the proposed project were not constructed, the region's power needs could be delivered through development of other generation facilities, most likely a gas-fired combustion turbine. The public service and utility impacts of such an alternative facility would depend on its location, but would require a greater amount of water for project operations.	