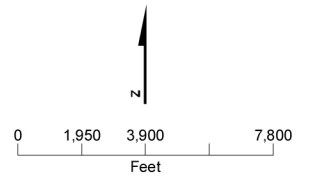


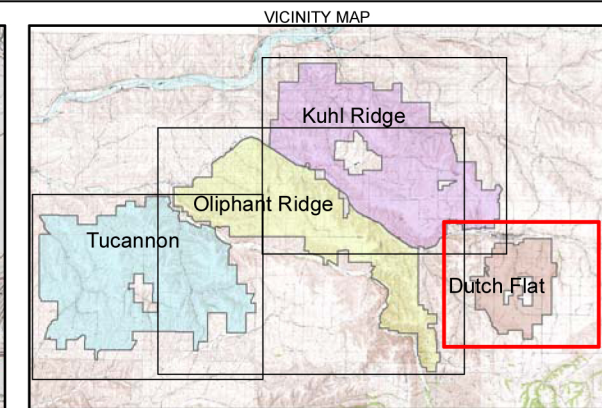
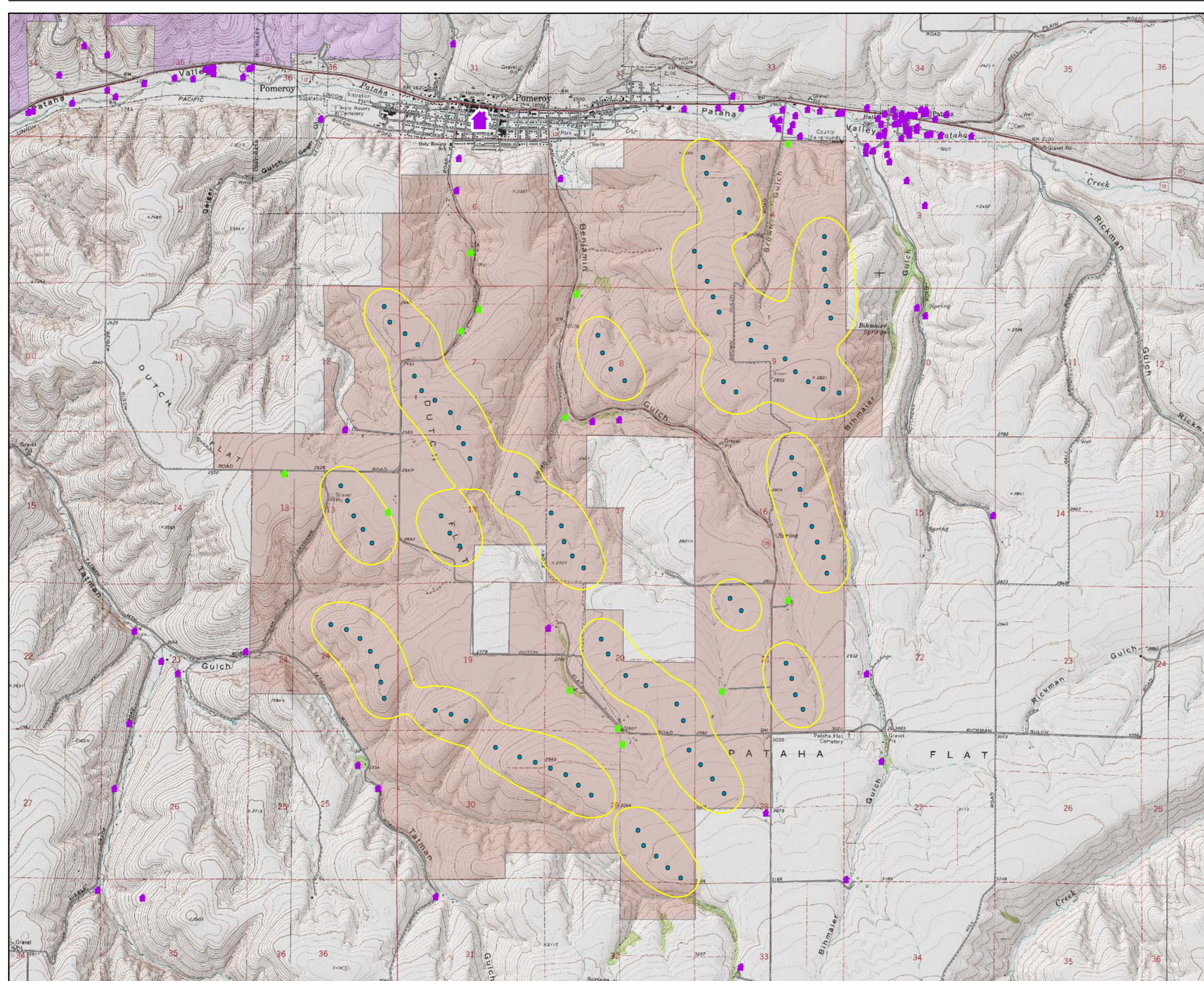
**LEGEND**

- Participating Residence
- Non-participating Residence
- Proposed Turbine
- 50 dBA\*
- Street
- Dutch Flat
- Kuhl Ridge
- Oliphant Ridge
- Tucannon

- Notes:**
1. Turbines and Residences are not to scale and are shown only for demonstrative purposes.
  2. Size of turbines and houses overemphasized for clarity; put to scale, houses and turbines would be difficult to discern.
  3. Does not depict potential reductions afforded by topographic shielding.
  4. Preliminary layout; final turbine siting subject to revisions based on, but not limited to, further environmental analysis, micro-siting and manufactures specifications.
- \* 50 dBA is the most restrictive noise limit at residential zones in accordance with WAC 173-60.

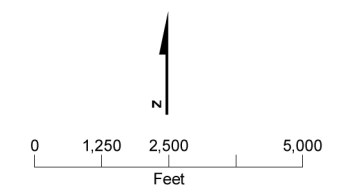


**Figure 2-15**  
**Preliminary Noise Contours for the Kuhl Ridge Wind Resource Area**



- LEGEND**
- Pomeroy Town
  - Participating Residence
  - Non-participating Residence
  - Proposed Turbine
  - 50 dBA\*
  - Street
  - Dutch Flat
  - Kuhl Ridge
  - Oliphant Ridge
  - Tucannon

- Notes:**
1. Turbines and Residences are not to scale and are shown only for demonstrative purposes.
  2. Size of turbines and houses overemphasized for clarity; put to scale, houses and turbines would be difficult to discern.
  3. Does not depict potential reductions afforded by topographic shielding.
  4. Preliminary layout; final turbine siting subject to revisions based on, but not limited to, further environmental analysis, micrositing and manufactures specifications.
- \* 50 dBA is the most restrictive noise limit at residential zones in accordance with WAC 173-60.



**Figure 2-16**  
**Preliminary Noise Contours for the Dutch Flats Wind Resource Area**

## **2. Affected Environment and Impacts Noise**

Because substations are exempt from nighttime limits under WAC 173-60-050(2)(a), substations would be subject to the daytime residential receptor limit of 60 dBA, even during the nighttime hours. All of the substations would be located far from any homes, so compliance with this performance specification is not expected to be a problem.

For the operating facility, a professional management staff of 4 to 5 people per phase would support planning, accounting, and other operations functions and approximately 89 total people would be involved in the day-to-day management, operation, and maintenance of the facility. These workers would make daily trips to and from the Project area in light-duty vehicles but would add little additional noise to the existing levels along the roadways.

Traffic between the O&M facility and individual turbines along Project access roads would be minimal during operations because multiple turbines can be maintained by a single individual. This traffic would consist of infrequent trips to turbines in service vehicles for maintenance and repair activities. Therefore, vehicular noise generated along access roads during routine turbine maintenance activities would be infrequent and would not result in substantial adverse noise effects.

### ***End of Design Life Impacts***

Decommissioning activities would be similar in type but shorter in duration compared to those anticipated for the construction phase. Blasting may be required. This would result in noise levels similar to those experienced during construction. The same mitigation measures recommended during construction could also be used during the decommissioning phase.

Repowering the existing Project would require continued compliance with existing noise emission regulatory limitations.

### ***Mitigation***

Although no specific receivers are identified as being impacted by construction noise at this time, the following contractor practices are recommended to minimize the effects of construction noise in the Project area:

- Implement work-hour controls so that most noise-generating activities occur between 7 a.m. and 10 p.m., which would reduce the impact during sensitive nighttime hours.
- Minimize the number of heavy-duty haul trucks traveling through the area during nighttime hours.
- Do not allow haul trucks to park and idle within 100 feet of a residential dwelling.

## **2. Affected Environment and Impacts Noise**

- Maintain equipment in good working order and use adequate mufflers and engine enclosures to reduce equipment noise during operation.
- Coordinate construction vehicle travel to reduce the number of passes by sensitive receivers.
- Noise modeling of turbine and substation locations will be conducted prior to obtaining building permits to verify that all state noise standards will be met.

### **2.10.2.2 No Action Alternative**

Under the No Action Alternative, the Project would not be constructed and no wind energy would be produced from the Project area. No construction or operation-related noise would be generated.

The No Action Alternative assumes that farming activities would continue in the Project area in accordance with its Agricultural zoning. Agricultural activity would generate the same type of noise impacts as currently exist, if any, in the WRAs.

### **2.10.2.3 Probable Significant and Unavoidable Adverse Impacts**

The Project is likely to increase ambient noise levels, at least for receptors within relatively close proximity to the Project site. However, because the Project will comply with state noise standards, assuming non-participating residences in close proximity to the Project are treated as Class A receptors, the Project's noise will not be a probable significant and unavoidable adverse impact.

### **2.10.2.4 Cumulative Impacts**

There are currently three wind farms operating in the vicinity of the proposed Project site: Hopkins Ridge (87 turbines) south and adjacent to Oliphant and east and adjacent to Tucannon WRA; Marengo I (78 turbines) south-southwest and adjacent to Oliphant WRA; and Marengo II (39 turbines) approximately 1 mile south of Tucannon WRA. However, while noise levels are additive, the noise level at any particular location is dominated by the loudest (typically the closest) turbines. More distant turbines have a diminishing effect on receptor levels. As discussed above, final engineering and design of wind turbines and overhead transmission lines will be done in a manner which ensures compliance with county setback ordinances and Washington State noise ordinances.

## **2.11 Climate and Air Quality**

### **2.11.1 Affected Environment**

#### **2.11.1.1 Climate**

Climate does not differ between the four WRAs; the discussion below applies to all.

#### All Four WRAs

#### **Regional Climate**

The WRAs are located at the southern edge of the Columbia Plateau (or Columbia Basin), a semi-arid region lying in the rain shadow of Cascade Mountains. The Columbia Plateau covers nearly one-third of the State of Washington (Washington Biodiversity Project 2009). The Cascade Mountains form a barrier to the mild, maritime air masses that influence the climate of western Washington and, north and east of the plateau, the Rocky Mountains block the dry, continental air masses moving south from Canada. The plateau's climate is influenced by both maritime and continental weather systems but is generally much drier than western Washington, with warmer summers and colder winters (Western Regional Climate Center 2009[a]).

Because the Columbia Plateau covers a large area of the state and contains many different landforms and elevations, climate varies within the region. The WRAs are located at the southern edge of the plateau, where the Palouse Hills meet the Blue Mountains to the south. The average minimum temperature in the region ranges from 20° to 25°F; the average maximum temperature ranges from 85° to 90 °F. Average annual precipitation increases with elevation in this region, with the Palouse Hills receiving from 10 to 20 inches and the higher elevations in the Blue Mountains receiving 40 inches or more (Western Regional Climate Center 2009[a]).

#### **Temperature and Precipitation Statistics**

Temperature and precipitation data is available from Remote Automated Weather Stations located in the cities of Pomeroy, Garfield County, and Dayton, Columbia County. The coldest average monthly temperatures, from a low of around 25 °F to a high of around 40 °F, occur in January at both locations. The warmest average monthly temperatures, from a low of around 54 °F to a high of around 87 °F, occur in July at both locations. Dayton receives more precipitation than Pomeroy, with average annual precipitation around 19 inches and average annual snowfall around 18 inches, compared to Pomeroy, which receives on average about 16 inches annual precipitation and 10 inches annual snowfall (Western Regional Climate Center 2009[b]; Western Regional Climate Center 2009[c]). The highest ridges in the WRAs are from 400 to 1,500 feet higher than Pomeroy and Dayton in elevation, these areas experience slightly cooler temperatures than those recorded in the cities. These higher elevation areas experience greater annual snowfall.

## 2. Affected Environment and Impacts Climate and Air Quality

### Extreme Temperatures and Wind Gusts

The maximum recorded temperature in Pomeroy was 110 °F, while the minimum recorded temperature was -27 °F. Maximum and minimum recorded temperatures in Dayton were similar: the maximum was 114 °F, while the minimum was -25 °F (Western Regional Climate Center 2009[b]; Western Regional Climate Center 2009[c]). In the Columbia Plateau region, extreme wind velocities (measured 30 feet above the ground) of 50 mph are estimated to occur at least once every two years, while wind gusts from 60 to 70 mph are estimated to occur once every 50 years and wind gusts of 80 mph are estimated to occur once every 100 years (Western Regional Climate Center 2009[a]). The wind turbines would begin to generate electricity at wind speeds around 9 mph. The turbines would be shut down at wind speeds exceeding 56 mph.

#### 2.11.1.2 Air Quality

##### All Four WRAs

##### Attainment Area Status

The Clean Air Act (CAA) is the primary federal statute governing the control of air quality. The CAA designates six pollutants as “criteria pollutants” for which National Ambient Air Quality Standards (NAAQS) have been established by the Environmental Protection Agency (EPA) to protect public health and welfare. These include particulate matter less than 10 microns in diameter (PM<sub>10</sub>), carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), lead (Pb), and ozone (O<sub>3</sub>). Under the CAA, state and local agencies may establish ambient air quality standards (AAQS) and regulations of their own, provided these are at least as stringent as the federal requirements. Table 2-31 summarizes the NAAQS and state AAQS.

**Table 2-31 National and Washington State Ambient Air Quality Standards**

Pollutant	Averaging Time	NAAQS <sup>1</sup>		Washington AAQS <sup>2</sup> Concentration <sup>5</sup>
		Primary <sup>3</sup>	Secondary <sup>4</sup>	
Ozone (O <sub>3</sub> ) <sup>6</sup>	1-Hour	–	–	0.12 parts per million (ppm) (235 micrograms per cubic meter [µg/m <sup>3</sup> ])
	8-Hour	0.08 ppm (1997 standard)	Same as Primary Standard	Same as NAAQS
		0.075 ppm (2008 standard)		
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m <sup>3</sup> )	Same as Primary Standard	Same as NAAQS
	1-Hour	35 ppm (40 mg/m <sup>3</sup> )	Same as Primary Standard	Same as NAAQS
Nitrogen Dioxide (NO <sub>2</sub> )	Annual Average	0.053 ppm (100 µg/m <sup>3</sup> )	Same as Primary Standard	0.05 ppm (100 µg/m <sup>3</sup> )
Sulfur Dioxide (SO <sub>2</sub> )	Annual Average	0.03 ppm (80 µg/m <sup>3</sup> )	–	0.02 ppm (60 µg/m <sup>3</sup> )

## 2. Affected Environment and Impacts Climate and Air Quality

**Table 2-31 National and Washington State Ambient Air Quality Standards**

Pollutant	Averaging Time	NAAQS <sup>1</sup>		Washington AAQS <sup>2</sup> Concentration <sup>5</sup>
		Primary <sup>3</sup>	Secondary <sup>4</sup>	
	24-Hour	0.14 ppm (365 $\mu\text{g}/\text{m}^3$ )	–	0.1 ppm (260 $\mu\text{g}/\text{m}^3$ )
	3-Hour	–	0.5 ppm (1300 $\mu\text{g}/\text{m}^3$ )	–
	1-Hour	–	–	0.4 ppm more than once per year  0.25 ppm more than two times per/week
Suspended Particulate Matter (PM <sub>10</sub> )	24-Hour	150 $\mu\text{g}/\text{m}^3$	Same as Primary Standard	Same as NAAQS
	Annual Arithmetic Mean	Revoked, effective December 17, 2006	Revoked, effective December 17, 2006	50 $\mu\text{g}/\text{m}^3$
Fine Particulate Matter (PM <sub>2.5</sub> )	24-Hour	35 $\mu\text{g}/\text{m}^3$	Same as Primary Standard	–
	Annual Arithmetic Mean	15 $\mu\text{g}/\text{m}^3$		–
Total Suspended Particulates	24-Hour	–	–	150 $\mu\text{g}/\text{m}^3$
	Annual Geometric Mean	–	–	60 $\mu\text{g}/\text{m}^3$
Lead (Pb)	Calendar Quarter	1.5 $\mu\text{g}/\text{m}^3$	Same as Primary Standard	–

Source: Washington Department of Ecology 2009

Notes:

- <sup>1</sup> NAAQS (other than O<sub>3</sub>, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O<sub>3</sub> standard is attained when the fourth highest 8-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM<sub>10</sub>, the 24-hour standard is attained when 99% of the daily concentrations, averaged over three years, are equal to or less than the standard. For PM<sub>2.5</sub>, the 24-hour standard is attained when 98% of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the EPA for further clarification and current federal policies.
- <sup>2</sup> Washington State Ambient Air Quality Standards from Washington Administrative Code 173 Regulations.
- <sup>3</sup> National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.
- <sup>4</sup> National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
- <sup>5</sup> Concentration expressed first in units in which it was promulgated. Ppm in this table refers to ppm by volume or micromoles of pollutant per mole of gas.
- <sup>6</sup> Effective May 27, 2008, EPA designated a new 8-hour ozone standard. The 1997 standard and implementation rules will remain in place until EPA completes rulemaking to address the transition to the new 2008 standard (U.S. Environmental Protection Agency 2009a).

Local air quality is measured against the NAAQS and state AAQS. If measured data indicates that an area meets the standards, the area is designated as an “attainment area;” areas that do not meet the standards are designated as “nonattainment areas.” Ecology has established air quality monitoring stations

## **2. Affected Environment and Impacts Climate and Air Quality**

throughout the state. The closest station to the WRAs is located in the city of Dayton in Columbia County. Both Columbia County and Garfield County are currently designated as in attainment with the NAAQS and state AAQS.

The most prevalent sources of air pollution in both Columbia and Garfield counties are mobile and non-point sources, including outdoor burning, agricultural tilling and harvesting, fugitive dust from paved and unpaved roads, emissions from on- and off-road vehicles, and fertilizer application (Washington Department of Ecology 2008). Few large stationary sources of air pollution exist in either county. One energy facility, Pacific Gas Transmission Company Station 7, located near the town of Starbuck in Columbia County about 2.5 miles from the Tucannon WRA, is designated as a major source of air pollution requiring an Air Operating Permit (AOP) under Title V of the CAA and WAC 173-401 (Washington Department of Ecology 2005).

### **Applicable Air Quality Regulations**

#### ***New and Modified Stationary Sources***

New and/or modified stationary sources of criteria air pollutants are regulated by the CAA and state air pollution regulations (WAC 173-400). Examples of these include new source review (WAC 173-400-110) and prevention of significant deterioration (WAC 173-400-720) regulations. In general, state regulations for stationary sources of air pollution set standards for the operation of these sources and establish rules for the control and/or prevention of criteria emissions. The proposed Project would not be considered a new stationary source of criteria air pollutants because wind turbines do not generate air pollutants during operation; therefore, the proposed Project would not be required to comply with the above-mentioned regulations.

#### ***Construction Emissions***

The State of Washington also regulates emissions generated by various construction activities. Regulations that apply to nuisance emissions, including fugitive dust, and various equipment used during construction are described below:

- WAC 173-400-040(2) Fallout, states that no person shall cause or allow the emission of particulate matter from any source to be deposited beyond the property under direct control of the owner or operator of the source in sufficient quantity to interfere unreasonably with the use and enjoyment of the property upon which the material is deposited.
- WAC 173-400-040(3 - 3a) Fugitive emissions, states that the owner or operator of any emissions unit engaging in materials handling, construction, demolition, or other operation which is a source of fugitive emissions, if located in an attainment area and not impacting any nonattainment area, shall take reasonable precautions to prevent the release of air contaminants from the operation.



## **2. Affected Environment and Impacts Climate and Air Quality**

- WAC 173-400-040(4) Odors, states that any person who shall cause or allow the generation of any odor from any source which may unreasonably interfere with any other property owner's use and enjoyment of his property must use recognized good practice and procedures to reduce these odors to a reasonable minimum.
- WAC 173-400-040(8a) Fugitive dust, states that the owner or operator of a source of fugitive dust shall take reasonable precautions to prevent fugitive dust from becoming airborne and shall maintain and operate the source to minimize emissions.
- WAC 173-400-035 Portable and Temporary Sources, states that for portable sources which locate temporarily at particular sites, such as rock crushers and batch plants, the owner(s) or operator(s) shall be allowed to operate at the temporary location providing that the owner(s) or operator(s) notifies Ecology or the local air quality authority of the intent to operate at the new location at least 30 days prior to starting the operation, and supplies sufficient information to enable Ecology or the local air quality authority to determine that the operation will comply with the emissions standards for a new source, and will not cause a violation of applicable AAQS and, if in a nonattainment area, will not interfere with scheduled attainment of ambient standards. The permission to operate shall be for a limited period of time (one year or less) and Ecology or the local air quality authority may set specific conditions for operation during that period. A temporary source shall be required to comply with all applicable emission standards.

### **2.11.2 Impacts and Mitigation**

#### **2.11.2.1 Preferred Alternative**

##### ***Construction Impacts***

###### All Four WRAs

Deterioration of regional air quality, a direct impact to air quality, will occur if emissions of a criteria pollutant during construction caused regional air quality to approach or exceed NAAQS or state AAQS. Air emissions generated by construction activities will include:

- Tailpipe emissions from operation of construction equipment and vehicles;
- Fugitive dust generated by construction of temporary and permanent access roads, travel on dirt and gravel roads, and ground-disturbing activities;
- Emissions generated by operation of a rock crusher and a batch plant; and
- Odors associated with exhaust from diesel equipment and vehicles.

Each of these air emissions sources is discussed in detail below.

##### **Tailpipe Emissions**

Emissions generated by the operation of construction equipment and vehicles will be the primary source of air pollution during construction. Table 1-3 lists the

## **2. Affected Environment and Impacts Climate and Air Quality**

construction equipment likely to be used. In addition, tailpipe emissions will be generated by vehicles used to transport construction employees and materials to and from the site. Air emissions generated by these types of equipment and vehicles include nitrogen oxides (NO<sub>x</sub>), hydrocarbons, and PM (U.S. Environmental Protection Agency 2009b). NO<sub>x</sub>, when combined with other air pollutants, produces ground-level ozone, or smog (U.S. Environmental Protection Agency 2009b). Construction equipment will be maintained according to manufacturer recommendations, and all equipment will comply with applicable emissions limits.

Emissions from vehicle and tailpipe exhaust will be similar to emissions generated by other large wind energy facility construction projects. For purposes of impact assessment, it was assumed that construction will occur in five phases, beginning in 2010 and ending in 2014. Due to the staggered construction schedule and the strong prevailing winds in the region, it is anticipated that emissions generated by operation of construction equipment will not cause regional air quality to approach or exceed NAAQS or state AAQS.

### **Fugitive Dust**

In addition to tailpipe emissions, operation of construction equipment and vehicles will generate fugitive dust from travel on dirt and gravel roads and from soil-disturbing activities at construction sites and staging areas. The amount of fugitive dust emissions will vary depending on the level and type of construction activity (i.e., earthmoving activities would generate more fugitive dust). Weather conditions, especially precipitation, will also affect the amount of fugitive dust generated. Activities associated with construction that could generate fugitive dust include:

- Ground-disturbing and excavation activities during road, staging area, and turbine foundation construction and installation of buried collector cables. Soil excavated during construction of temporary roads and staging areas will be stockpiled and used to restore temporary roads and staging areas to their original condition upon completion of construction.
- Blasting and excavation activities at on-site rock quarries. The specific number of quarries will be determined prior to construction. The quarries will become operational two weeks prior to road construction activities and would remain in operation until turbine foundations are completed.
- Operation of a portable rock crusher and a portable concrete batch plant (discussed further below).
- Gravel-pit reclamation.

Nuisance emissions from construction sites, including fugitive dust, are regulated in the State of Washington. To comply with fugitive dust regulations under WAC 173-400-040, mitigation measures will be used to minimize fugitive dust impacts. Proposed mitigation measures are discussed under Mitigation, below.

## **2. Affected Environment and Impacts Climate and Air Quality**

### **Portable Rock Crusher and Batch Plant Emissions**

If determined necessary, one or portable rock crushers and one or more portable concrete batch plants per WRA will be established on the Project site to supply the large amounts of gravel and concrete required for the Project. The rock crushers may be located at one of the on-site quarry pits for the duration of the construction period.

The primary air pollutant generated by the rock crusher and batch plant will be particulate matter (PM), which will be generated by activities such as rock crushing and storing, moving, and loading sand and other aggregate materials used to make cement. In addition, both facilities will be powered by diesel generators, which will emit NO<sub>x</sub>, hydrocarbons, CO, PM, and a small amount of SO<sub>2</sub>.

Operators of concrete batch plants in Columbia and Garfield counties must apply for a Coverage Order under the General Order of Approval for Concrete Batch Plants (General Order No. 08-AQG-002) from the Ecology's Air Quality Program (Washington State Governor's Office of Regulatory Assistance 2009). The Coverage Order will ensure equipment compliance with NAAQS and state AAQS. DOE must be notified 30 days before the beginning of operations. A Coverage Order is issued for equipment meeting pre-determined approval conditions developed by DOE. The General Order of Approval for Concrete Batch Plants outlines applicability criteria for equipment covered under the general order of approval, including size, design, and equipment criteria.

The General Order of Approval for Concrete Batch Plants includes approval conditions specifying required measures to reduce emissions. In addition, the DOE Air Quality Program has developed a required Fugitive Dust Control Plan (FDCP) as a supplement to the general order of approval. The Project's compliance with the approval conditions and the FDCP is discussed under Mitigation.

Operators of portable rock crushers in Columbia or Garfield counties similarly must apply for a Coverage Order under the General Order of Approval for Portable Rock Crushers (General Order No. 07-AQG-001) from the Ecology's Air Quality Program. DOE must be notified 30 days before the beginning of operations. Rock crushers are required to be sited in areas that are in attainment for PM<sub>2.5</sub> and PM<sub>10</sub>. All of the WRAs meet this requirement.

The General Order of Approval for Portable Rock Crushers requires compliance with an FDCP. The Project's compliance with the FDCP and the approval conditions summarized above is discussed under Mitigation.

### **Odors**

Operation of diesel equipment and vehicles during construction will produce limited odors, which will be most noticeable in the immediate vicinity of

## **2. Affected Environment and Impacts Climate and Air Quality**

construction sites. Given the strong prevailing winds at the sites, odors will be dispersed within a short distance. It is anticipated that odors produced during construction activities will not unreasonably interfere with surrounding property owners' use and enjoyment of their properties.

### ***Project Facility Impacts***

#### All Four WRAs

Operation of the wind energy facility will not produce any emissions of criteria air pollutants or greenhouse gases, because wind energy facilities do not burn fossil fuels to produce energy.

#### **Emissions**

Wind turbines generate no emissions during operation because they do not burn fossil fuels to produce energy. The Project's renewable energy production will avoid air emissions, and fossil fuel use and depletion. As a renewable energy resource, wind energy can displace the air pollutant emissions associated with other forms of fossil-fuel-based electricity generation comprising a region's power generation mix.

#### ***Avoided Emissions***

In the Northwest Power Pool region, coal and natural gas accounted for 34.4% and 10.6%, respectively, of the region's generation capacity in 2004. Hydroelectric power accounted for 49% of the region's generation resource mix (eGrid 2007).

Table 2-32 shows the non-baseload output emission rates for carbon dioxide (CO<sub>2</sub>) and the criteria air pollutants nitrogen oxide (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>) and mercury (Hg) for Washington State. The avoided emissions attributable to the Project assume it will operate at an effective 30% capacity during a steady state year in which the entire nameplate capacity of 1,432 MW has been installed. To estimate the displaced emissions associated with the Project's power output, a non-baseload emission factor was applied to calculate the avoided emissions associated with the incremental power contributions of the Project to the regional power load curve. A baseload emission factor was not applied because this factor would have overstated or inflated the emissions displaced from the Project based on the dispatch order and average assumed capacity factor of the Project.

During facility operations (at full build out), the Project will displace 2.9 million tons of CO<sub>2</sub> per year, 2,960 tons of SO<sub>2</sub>, 4,640 tons of NO<sub>x</sub>, and 24 tons of Hg. Columns 3 and 4 place the emission reduction benefits in perspective. In 2004, the State of Washington emitted 18.3 million tons of CO<sub>2</sub> (eGrid 2007). The emissions avoided because of the Project will be 16% of the state total for CO<sub>2</sub>, 36% for SO<sub>2</sub>, and 21% for NO<sub>x</sub>. These reduced emissions will reduce the Project's carbon footprint

## 2. Affected Environment and Impacts Climate and Air Quality

**Table 2-32 Air Pollutant Emissions Displaced by the Project**

Air Pollutant	Emission Rates (lb/MWh) <sup>1</sup>	Tons Displaced by Project	Washington State Emissions 2004	Project/Washington State Emissions (%)
CO <sub>2</sub>	1,532	2,882,685	18,275,216	15.8
SO <sub>2</sub>	1.573	2,960	8,203	36.1
NO <sub>x</sub>	2.466	4,640	22,501	20.6
Hg	0.013	24	661	3.7

Notes:

<sup>1</sup>Non-baseload output emission rates for NWPP (Northwest Power Pool) WECC Northwest Region.

Estimates based on annual electricity production during a steady state year with a 30% capacity factor. Estimated MWh (e.g., @ 2015) = [1,432 MW] x [0.30 capacity factor] x [24 x 365] = 3,763,296.

Source: eGrid2006 Version 2.1 (April 2007) Year 2004 Summary Tables

### Avoided Fossil Fuel Use and Depletion

Facility operations will also avoid the consumption of fossil fuels used in the generation of equivalent energy through thermal-based power generation systems. To put these energy savings benefits in perspective, energy equivalent calculations are provided based on the equivalent BTU content of the Project's electricity output during a steady state year. Table 2-33 shows the results of the calculations.

**Table 2-33 Fossil Fuel Energy Equivalents and Market Values for the Project's Electricity Production**

	Energy Type	Annual Value	Unit
	<b>Crude oil (barrels)</b>	2,213,856	Barrels
	Annual gallons	92,981,960	Gallons
	Gallons per day	254,745	GPD
A	Market value of crude oil	\$151,826,258	Dollars
	<b>Gasoline</b>	103,551,338	Gallons
B	Market value of gasoline	\$196,499,020	Dollars
	<b>Heating oil or diesel fuel</b>	92,376,733	Gallons
C	Market value of heating oil	\$163,044,935	Dollars
D	Market value of diesel fuel	\$163,506,818	Dollars
	<b>Natural gas</b>	12,490,628,358	Cubic Feet
E	Market value of natural gas	\$69,822,613	Dollars
	<b>Propane</b>	141,102,923	Gallons
F	Market value of propane	\$117,820,940	Dollars
	<b>Coal</b>	636,639	Short Tons
G	Market value of coal	\$26,738,825	Dollars

Notes:

A: based on 6/2/09 WTI, Cushing Oklahoma spot price

B: based on 6/2/09 New York Harbor, regular

C: based on 6/2/09 Heating Oil No. 2, New York Harbor

D: based on 6/2/09 Low Sulfur No. 2 Diesel fuel, New York Harbor

E: based on Feb 09, Electric power price \$5.59/Mcf

F: based on 6/3/09 Mont Belvieu, TX

G: based on 5/29/09 Uinta basin \$/short ton price

Source: Market prices sourced from U.S. DOE/EIA (2009)

## **2. Affected Environment and Impacts Climate and Air Quality**

The Project's annual electricity production is estimated to be 3.76 million MWh. This energy is equivalent to 2.2 million barrels of crude oil with a recent market value of \$152 million. Alternatively, the Project's output will be equivalent to 12.5 billion cubic feet of natural gas with an estimated annual market value of \$69.8 million. The Project's output will displace 636,639 short tons of coal equivalent on an annual basis with a market value of \$27 million. Since the above forms of energy are non-renewable resources, the energy savings associated with the Project's output are valuable because they avoid and defer future resource depletion.

### Vehicle Emissions

Emissions generated during operation of the facility will be limited to tailpipe emissions (i.e., CO, hydrocarbon, and NO<sub>x</sub>) from operational vehicles used for operation and maintenance activities and fugitive dust emissions from travel on gravel roads (discussed further below). Approximately 30-60 vehicles will be used for operations and maintenance during normal operation of the Project. These vehicle estimates include vehicles used by the turbine manufacturer. Vehicles will be maintained and inspected according to all applicable federal and state regulations. Tailpipe emissions from operational vehicles will not cause regional air quality to approach or exceed NAAQS or state AAQS.

An aggregate local staff of 89 total for the Project will be involved in the day-to-day management, operation, and maintenance of the facility, with subcontractors or local utility crews infrequently used to test and maintain the electrical collection system and substation. Some of these employees likely currently reside in the local area. Any increase in population due to the addition of permanent jobs will not generate an increase in vehicle emissions sufficient to cause regional air quality to approach or exceed NAAQS or state AAQS.

### ***Fugitive Dust Sources***

Operational traffic on gravel access roads will generate limited amounts of fugitive dust. Operational traffic will consist of privately-owned vehicles used for commuting to and from the facility and operational vehicles used for inspection and maintenance activities. Access roads will be maintained in compliance with applicable state and county standards and regulations, thereby minimizing fugitive dust emissions.

### ***Odors***

Operation of the wind turbines will produce no odors, because no combustion would be involved and no odor-producing materials will be used during operation. Limited odors will be produced by operational and privately-owned vehicles. Tailpipe odors will be similar to those produced by other light vehicles and will not be noticeable on surrounding properties.

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### ***Greenhouse Gases***

Operation of the wind energy facility will not result in emissions of greenhouse gases (GHGs) because no fossil fuels (i.e., coal and natural gas) will be burned to produce energy. Common GHG emissions include carbon dioxide (CO<sub>2</sub>), methane, and nitrous oxide. GHG emissions are often the result of fossil fuel use, and therefore, many corporations, governments, and agencies are devising ways to reduce use of these fuels, or are planning or already implementing regulations on GHG emissions.

The State of Washington has passed several regulations requiring reduction of GHG emissions, including a statute requiring large utilities to obtain 15% of their electricity from new renewable energy resources by 2020 (Chapter 19.285 RCW). The Project will generate approximately 3.8 million megawatt hours (MWh) of electricity in a year (based on a 30% capacity factor), which could abate approximately 462,900 tons of carbon dioxide emissions from conventional energy facilities annually (Partnerships for Renewables 2009). Each Washington household, on average, uses about 12.9 MWh of electricity annually (Energy Information Administration 2009). Given that average, the electricity produced by the Project could power about 292,300 Washington households.

In February 2009, the Climate Impacts Group at the University of Washington and the Climate Leadership Initiative at the University of Oregon published two studies projecting the effects of climate change on Washington's environment and economy. The Climate Impacts Group found that changes in temperature, precipitation and water availability would result in the following:

- An increase in the number of deaths due to heat and air pollution;
- An increase in the area of forest destroyed by fire (double current levels by 2040) and more frequent and severe mountain pine beetle outbreaks;
- Yield gains for some crops during the short-term, due to elevated carbon dioxide levels, but increasing yield losses over the long-term;
- A reduction in the quality and extent of freshwater salmon habitat due to rising stream temperatures;
- Sea level rise ranging from 2 to 13 inches, which would increase coastal erosion and endanger coastal structures;
- A decrease of 9 to 11 percent in summer hydropower production and an increase of 0.5 to 4 percent in winter production by the 2020s;
- Substantial (240%) increase in summer energy demand; and
- Increased stress on existing stormwater infrastructure due to a higher number of extreme precipitation events (Washington Department of Ecology February 2009).

The Climate Leadership Initiative found that, if no measures are taken to reduce GHG emissions, total economic costs in Washington would increase by approximately \$3.8 billion per year by 2020, averaging to about \$1,250 in annual increased costs per household. Increased costs would be incurred due to factors

## **2. Affected Environment and Impacts Climate and Air Quality**

including continued use of less efficient energy technologies and increased energy costs, increased health costs, increased storm and fire damage costs, and reduced food production (Washington Department of Ecology February 2009). In addition to contributing to the renewable energy targets, the Project will help to keep economic costs down and will contribute to improving the environment.

### ***End of Design Life Impacts***

Repowering or decommissioning of the facility will require the same types of construction equipment used to construct the facility. Repowering or decommissioning operations will generate tailpipe and fugitive dust emissions similar to those described under Construction Impacts. Mitigation measures that will be used to minimize or prevent these emissions are described below. Due to the staggered construction schedule and the strong prevailing winds in the region, it is anticipated that emissions generated by operation of construction equipment will not cause regional air quality to approach or exceed NAAQS or state AAQS.

Emissions generated during continued operation of the facility will be limited to tailpipe emissions from vehicles used for operation and maintenance activities and fugitive dust generated by travel on gravel roads. Operational vehicles will be maintained and inspected according to all applicable federal and state regulations. Therefore, tailpipe emissions from operational vehicles will not cause regional air quality to approach or exceed NAAQS or state AAQS. Mitigation measures that will be used to minimize fugitive dust during operation of the facility are discussed below under Mitigation.

### ***Mitigation***

In accordance with the fugitive dust regulations under WAC 173-400-040, as described in Section 2.11.1.2, the Project will take reasonable precautions to prevent fugitive dust from becoming airborne and will properly maintain and operate equipment to minimize emissions. A dust control plan identifying potential sources of fugitive dust and describing dust control methods will be prepared for the Project. This plan will include the identification of all fugitive dust sources, a description of the dust control method(s) to be used for each source, and a schedule or rate of application to identify how often and how much control will be used. Construction will occur in phases, minimizing areas where vegetation has been cleared which will be more susceptible to wind erosion. Areas temporarily disturbed during construction, including staging areas and temporary access roads, will be restored to their original condition and revegetated following construction. Construction of temporary access roads will require grading. Topsoil will be stripped and stockpiled for restoration once construction is completed. Stockpiles of soil will be covered with wind-impervious fabric to prevent airborne dust (Ecology 2003).



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Vehicle-specific mitigation measures for construction-related air emissions and dust include the following:

- All vehicles used during construction will comply with applicable federal and state air quality regulations for tailpipe emissions;
- Carpooling among construction workers will be encouraged to minimize construction-related traffic and associated emissions; and
- When in operation, vehicles will limit engine idling time and equipment will be shut down when not in use.

In addition to the measures discussed above, specific measures to be implemented for unpaved roads and lots include the following (Ecology 2003):

- Limit traffic speeds to the posted speed limits to minimize the generation of dust;
- Add surface gravel to reduce the source of dust emission;
- Encourage the use of alternate, paved roads, where available;
- Restrict use by tracked vehicles and heavy trucks to prevent damage to road surface and base; and
- Water or dust pallatives to be applied as necessary to control road dust from construction vehicles within 500 feet of residences.

Water will be applied to temporary access roads and cleared areas as necessary to reduce the amount of airborne dust. Other dust pallatives, such as lignin sulfinate, magnesium chloride, or calcium chloride products, could be used with or in place of water to reduce the amount of water needed (Ecology 2003). Existing county dust abatement processes will be adhered to, and locally approved dust suppressant chemicals would be used. For example, Garfield County utilizes a magnesium chloride compound (a magnesium lignin blend) for dust abatement. Columbia County utilizes a mixture comprised of 30% lignin sulfinate and 70% magnesium chloride. Excessive and repeated applications of dust suppressant chemicals will be avoided, and the application of such chemicals will be timed to avoid or minimize their wash-off by rainfall or irrigation (Ecology 2003).

Permanent graveled access roads will be maintained in compliance with county regulations, thereby minimizing fugitive dust emissions. Additional dust suppression methods to be employed will include stabilizing road shoulders with gravel and vegetation.

As noted above, the General Order of Approval for Concrete Batch Plants and the General Order of Approval for Portable Rock Crushers each require compliance with an FDCP. Each FDCP lists required and recommended methods for dust suppression, which are summarized in Tables 2-34 and 2-35. The Project will comply with all requirements of the FDCPs.

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**Table 2-34 Fugitive Dust Control Plan for Concrete Batch Plants**

Fugitive Emission Control Options	Required/ Recommended/ As Necessary
Adequately wet aggregate and sand to minimize dust emissions when transferring to storage and aggregate bins.	Required
Locate stockpiles to minimize front-end loader travel.	Required
Pave, chemically treat, and/or use water-spray onsite vehicle traffic areas. The following factors should be considered when applying water and/or dust suppressants to on-site vehicle traffic areas: <ol style="list-style-type: none"> <li>1. Application rate: Amount of water and/or type and amount of suppressant applied per unit area of roadway (gals/square foot)</li> <li>2. Frequency of application (time between applications)</li> <li>3. Traffic volumes (vehicles per hour)</li> <li>4. Weather conditions</li> </ol>	Required
Maintain and enforce speed limitations for site vehicles.	Required
Locate, size, and configure stockpiles to reduce wind erosion.	Recommended
Apply water spray to stockpiles to minimize fugitive emissions.	As Necessary
Mechanically clean (i.e., sweep) paved surfaces and remove vehicle track-out from the site.	As Necessary

Source: Ecology June 18, 2008

**Table 2-35 Fugitive Dust Control Plan for Portable Rock Crushers**

Fugitive Emission Control Options	Required/ Recommended/ As Necessary
Have a water truck and water storage tank onsite at all times the crusher is in operation. The following factors should be considered when applying water to access roads and on-site vehicle access areas: <ol style="list-style-type: none"> <li>1. Application rate: amount of water applied per unit area</li> <li>2. Frequency: time between applications</li> <li>3. Vehicles per hour</li> <li>4. Weather conditions</li> </ol>	Required
Install and maintain water application systems on the crusher during operation.	Required
Maintain and enforce speed limitations for site vehicles.	Required
Locate, size, and configure stockpiles to reduce wind erosion.	Recommended
Apply dust suppressant to roadways, considering: <ol style="list-style-type: none"> <li>1. Type and amount of suppressant applied per unit of roadway</li> <li>2. Frequency of applications</li> <li>3. Traffic volumes</li> <li>4. Weather conditions</li> </ol>	As Necessary
Mechanical cleaning (i.e., sweeping paved surfaces)	As Necessary
Revegetation	As Necessary
Wind Erosion Response Plan	As Necessary

Source: Ecology February 6, 2007

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### **2.11.2.2 No Action Alternative**

Under the No Action Alternative, the Project will not be constructed and no wind energy will be produced from the Project area. No construction or operation-related air emissions or fugitive dust emissions from the Project will be generated.

Under the No Action Alternative, additional renewable or non-renewable energy facilities will need to be constructed to meet forecasted energy demand in the Pacific Northwest. Construction of additional renewable energy facilities will be required to meet the annual renewable energy targets set by Chapter 19.285 RCW (see Section 1). Construction-related emissions will be proportionate with the total land disturbed with such projects.

If the Project were not built, a natural gas-fired power plant generating plant might be constructed to produce the power that would have been produced by the Project. Since the Project would have a capacity of 1,432 MW and is expected to have a 33% net capacity factor, a natural gas-fired combustion turbine facility would have to generate approximately 473 average MW of energy to replace an equivalent amount of power produced by the Project. An example is provided here for comparative purposes, to illustrate differences in emissions. The Hermiston Generating Plant is a 468 MW natural gas combined-cycle combustion turbine power generating plant located in Umatilla County, Oregon. According to the Oregon Department of Environmental Quality, the maximum permitted air emissions for this plant are as follows: 272 tons per year of NO<sub>x</sub>, 11 tons per year of SO<sub>2</sub>, and 447 tons per year of CO (Oregon Department of Environmental Quality 2003). NO<sub>x</sub>, SO<sub>2</sub>, and CO are all criteria pollutants. Thus, while the Project will not produce emissions during operation, a fossil-fuel powered energy facility will produce emissions throughout its operational life.

### **2.11.2.3 Probable Significant and Unavoidable Adverse Impacts**

As mitigated, the Project will have no probable significant and unavoidable adverse impact to climate and air quality.

### **2.11.2.4 Cumulative Impacts**

Both Columbia and Garfield counties are designated as in attainment for all NAAQS and AAQS. Construction of the Project will result in air emissions primarily in the form of vehicle exhaust and fugitive dust emissions. Similar direct impacts will be associated with the development of the identified regional wind energy projects, proposed as potential interconnection requests in Columbia and Garfield counties. BMPs and other mitigation measures will be employed to minimize fugitive dust and vehicle exhaust emissions. In addition, the development of the Blue Mountain Station in Columbia County and the Columbia County transportation building at the Port of Columbia Industrial Park will generate air emissions during construction, as will the transportation-related actions proposed throughout both Columbia and Garfield counties. It is not anticipated that the incremental impact resulting from these projects and actions

## 2. Affected Environment and Impacts Climate and Air Quality

will be sufficient to cause regional air quality to approach or exceed NAAQS or state AAQS.

The only anticipated cumulative air emissions during operation of the Project and the potential regional wind energy facilities will be from vehicles used for operation and maintenance activities. However, due to the small number of these vehicles in use during operations, no significant air quality cumulative impacts will occur during Project operation. The generation of electricity by these wind power projects will contribute to benefits to air quality, as they will avoid cumulative emissions from other non-renewable, fossil fuel power sources. In addition, the Project and the other potential wind energy facilities will cumulatively contribute to meeting the renewable energy targets for the State of Washington, lowering the amount of GHGs produced. The benefits, in the form of CO<sub>2</sub> diversion, from these renewable energy facilities are discussed below.

Three wind energy facilities are currently operating in Columbia County:

- Hopkins Ridge, consisting of 87 1.8 MW Vestas turbines;
- Marengo I, consisting of 78 1.8 MW Vestas turbines; and
- Marengo II, consisting of 39 1.8 MW Vestas turbines.

These existing wind energy facilities in Columbia County abate a total of approximately 119,000 tons of CO<sub>2</sub> from conventional energy facilities annually and power about 75,000 households. Table 2-36 shows the amount of CO<sub>2</sub> diverted and the number of households powered by each of the existing facilities (Partnerships for Renewables 2009; Energy Information Administration 2009). As noted above, the Project will divert approximately an additional 462,900 tons of carbon dioxide emissions from conventional energy facilities annually, and the electricity produced by the Project will power about 292,300 Washington households.

**Table 2-36 Diversion of CO<sub>2</sub> by Existing Wind Energy Facilities in Columbia County, Washington**

Wind Energy Facility	CO <sub>2</sub> Diverted (Tons/Year)	Number of Households Powered
Hopkins Ridge	50,620	31,962
Marengo I	45,383	28,656
Marengo II	22,692	14,328
<b>Total</b>	<b>118,695</b>	<b>74,946</b>

Source: Partnerships for Renewables 2009; Energy Information Administration 2009

## **2.12 Public Services and Utilities**

### **2.12.1 Affected Environment**

#### **2.12.1.1 Fire and Emergency Services**

##### Tucannon and Oliphant Ridge WRAs (Columbia County)

The portion of the Oliphant Ridge WRA within Columbia County is under the jurisdiction of Columbia County Fire District #3, while the Tucannon WRA is under the jurisdiction of multiple fire districts (Columbia County Fire Districts #1 and #3 and Walla Walla/Columbia County Fire District #2). Dispatch for all Columbia County fire districts is provided by the Columbia County E-911 center in Dayton. The districts are described below:

- Fire District #1 is stationed in Starbuck and serves the northwestern 125 square miles of the county. The district is staffed by 25 volunteer firefighters and a paid fire chief and secretary.
- Walla Walla/Columbia County Fire District #2 is stationed in Waitsburg and serves the southwestern 94 square miles of the county. The district is staffed by between 28 and 35 volunteer firefighters.
- Fire District #3 is stationed in Dayton, with a secondary station in Turner, and serves 276 square miles of Columbia County. The district is staffed by two paid officers and 52 volunteer firefighters. In addition, two County employees are trained as all hazards members of the fire district and respond to emergencies as needed. Columbia County Fire District #3 provides the only emergency ambulance and rescue services for most of the county, including the Project. Fire District #3 also provides specialized services such as high angle rope rescue and basic materials response. Fire District #3 operates two structure fire engines, three Type 3 wildland fire engines, two Type 6 grass trucks, three water tenders, one heavy rescue support truck for structure fires, one light rescue truck for motor vehicle accidents, two ambulances, one high angle rope vehicle, as well as a couple of command-type vehicles (Columbia County Fire District #3 2009).

In addition, the Department of Natural Resources and the U.S. Forest Service provide fire protection services to public lands in the southern part of the county, including Umatilla National Forest (Columbia County Fire District #3 2009).

Wildland fire (grass, brush, and timber) risk in Columbia County is highest from late May through early October. The northern part of Columbia County is generally drier and more arid than the southern part of the county and is largely covered by bunch grass and scrub vegetation and wheat crops that burn hot and rapidly (Columbia County Fire District #3 2009). The Tucannon WRA and the portion of the Oliphant Ridge WRA within Columbia County are both in this part of the county.

Primary response to structural and wildland fires within the Project will be provided by the fire district with jurisdiction over the area affected. Secondary

## **2. Affected Environment and Impacts Public Services and Utilities**

response will be provided by the next closest fire district. Fire District #3 will provide primary ambulance and rescue response, and will be the primary responder for emergencies requiring high angle rope rescue or hazardous materials response. Fire District #3 will also provide assistance to Fire District #1 for wildland fires larger than a couple of acres and working structure fires. The response capabilities of Fire District #1 are currently limited by a personnel shortage. Mutual Aid Agreements for fire and emergency response to the Project are in place between Columbia County Fire Districts #1 and #3 and Walla Walla/Columbia County Fire District #2 with Waitsburg Ambulance Service, a privately-owned ambulance service (Columbia County Fire District #3 2009; Naumann 2009).

Secondary response for ambulance and rescue services will be provided by Columbia County/Walla Walla County Joint Fire District #2 and Waitsburg Ambulance Service. Waitsburg Ambulance Service employs 14 emergency responders and operates one Type III ambulance and one medium-duty ambulance. In addition, the Walla Walla City/County Fire Department provides back-up Advanced Life Support. Secondary response for high angle rope rescue will be provided by the Walla Walla Fire Department's Technical Rescue Team (Columbia County Fire District #3 2009; Naumann 2009).

Emergency helicopter transport is provided by Northwest MedStar, which is based out of the Tri-Cities as well as Spokane. State law requires trauma patients to be transported to the highest level trauma center within 20 minutes. Most trauma patients are first transported to Dayton General Hospital, which is a Level V Trauma Center, to be stabilized prior to being transported by helicopter to another hospital. Providence St. Mary and Walla Walla General Hospital in the city of Walla Walla are both Level III trauma centers. Kadlec Medical Center, located in Richland, Benton County, is also a Level III trauma center (Columbia County Fire District #3 2009; Naumann 2009).

### Kuhl Ridge, Dutch Flats, and Oliphant Ridge WRAs (Garfield County)

Garfield County Fire District #1 provides fire protection and emergency services for all of Garfield County outside of Umatilla National Forest and areas under the jurisdiction of the Department of Natural Resources (DNR) fire department. The fire district's ambulance service does respond to emergencies in the national forest and on all state-owned land. The fire district is staffed by 21 volunteer fire fighters and 17 First Responders and Emergency Medical Technicians (EMTs). Equipment operated by the fire district includes two structure fire engines, six brush fire trucks, and two Basic Life Support (BLS) ambulances. Dispatch is provided under a contract with the Garfield County Sheriff's Department. Response is from the Pomeroy fire department, and all equipment is stationed there with the exception of four brush trucks that travel with the county's fire commissioners and harvest operations (Bunch Pers. Comm. 2009).

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Garfield County Fire District #1 would respond to all structural and wildland fires within the Dutch Flat and Kuhl Ridge WRAs and the portion of the Oliphant Ridge WRA within Garfield County. No portions of the WRAs are under the jurisdiction of DNR. Additional response to fires or emergencies within the WRAs would be provided under mutual aid agreements with Columbia County Fire Districts #1 and #3, Whitman County Fire Districts #8 and #13 and Asotin County Fire District #1. Wildfire risk in the WRAs is greatest during late summer and early fall, when precipitation levels are low (Bunch Pers. Comm. 2009).

Garfield County emergency services provide transport to Garfield County Memorial Hospital for minor injuries. Major trauma patients are transported to the nearest Level II Trauma Center, St. Josephs Regional Medical Center, which is about 30 miles east of Pomeroy in Lewiston, Idaho. Medical Air Transport for major trauma patients is provided by Northwest MedStar, located in Spokane (Bunch Pers. Comm. 2009).

### **2.12.1.2 Police**

#### Tucannon and Oliphant Ridge WRAs (Columbia County)

The Columbia County Sheriff's Department provides police protection for Columbia County, including Dayton and Starbuck. The sheriff's department employs nine full-time deputies, ten part-time reserve deputies, four full-time Communications Officers, and three part-time Communications Officers. Dispatch and the department's patrol vehicles are based at the Columbia County Courthouse in Dayton. In addition to the patrol unit, the sheriff's department includes a Search and Rescue Unit with one vehicle, a Snowmobile Patrol/Rescue Unit with two snowmobiles and two quad-runner motorcycles, and a Dive Rescue/Boat Patrol Unit with one 16 foot metal jetboat (Columbia County 2007; Columbia County Sheriff's Office 2009).

#### Kuhl Ridge, Dutch Flats, and Oliphant Ridge WRAs (Garfield County)

Garfield County Sheriff's Department serves the entire county, including the city of Pomeroy. The sheriff's department employs seven full-time officers, six reserve deputies, and eight dispatchers (Garfield County 2009a). The department provides various services including patrols, investigations, arrests, and incarcerations. Usually one deputy is on-duty at a time; secondary response to emergencies is provided by an on-call deputy or the sheriff (Bowles 2009).

### **2.12.1.3 Medical Services**

#### Tucannon and Oliphant Ridge WRAs (Columbia County)

The Columbia County Health System serves the entire county and includes Dayton General Hospital, a fully-accredited Critical Access Hospital with 25 combined acute and swing patient beds (Button Pers. Comm. 2009). The hospital's Trauma Center includes one emergency room, and cannot accommodate multiple patients at once. There is a proposed project to construct a

## **2. Affected Environment and Impacts Public Services and Utilities**

second emergency room at the hospital; however, funds have not been appropriated for this project (Button Pers. Comm. 2009).

In addition to Dayton General Hospital, Columbia County Health System includes two family practice clinics, Columbia Family Clinic, located in Dayton, which employs four physicians and two mid-level care providers, and Waitsburg Clinic, which employs one physician and two mid-level care providers (Button 2009; Columbia County Health System 2009). One independent clinic, Convenient Care Clinic, employing one mid-level care provider, is also located in Dayton (Button Pers. Comm. 2009).

### Kuhl Ridge, Dutch Flats, and Oliphant Ridge WRAs (Garfield County)

Garfield County Public Hospital District #1 is located in Pomeroy and provides medical services to the entire county. The hospital district includes four facilities: Pomeroy Medical Clinic, Garfield County Long Term Care, Memory Lane Child Care Center, and Garfield County Memorial Hospital. Garfield County Memorial Hospital is a Level V Trauma Care, Critical Access Hospital with nine beds (Garfield County Hospital District 2009). Trauma patients transported to Garfield County Memorial Hospital are stabilized before air transport to the nearest Level III or Level II Trauma Center. The nearest Level II Trauma Center is St. Joseph's Regional Medical Center in Lewiston, Idaho.

#### **2.12.1.4 Schools**

### Tucannon and Oliphant Ridge WRAs (Columbia County)

Columbia County has two school districts, the Dayton School District and the Starbuck School District; the Project is located within the Dayton School District. The Dayton School District includes an elementary school, middle school, and high school as well as an administrative office. Enrollment for the 2008-2009 school year in actual enrollment and the corresponding full time equivalent (FTE) is provided in Table 2-37. The FTE is a measure of the number of students who are funded full-time. The existing capacity of the Dayton School District is 600 FTE students. Actual enrollment in the district has been decreasing by an average of 12.5 students per year (Stewart 2009).

### Kuhl Ridge, Dutch Flats, and Oliphant Ridge WRAs (Garfield County)

Pomeroy School District #110 is the only school district in Garfield County and includes three schools: Pomeroy Elementary School, Pomeroy Jr/Sr High School, and Pataha Creek Alternative High School. Average enrollment for the 2009 school year is provided in Table 2-38 below. FTE numbers for Pomeroy School District #110 are unavailable. Enrollment in the school district has fluctuated from 2004 to 2009 but has generally decreased over that time period (Ruchert 2009).



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**Table 2-37 Actual Enrollment and Full-Time Equivalent for the 2008-2009 School Year, Dayton School District, Columbia County**

Grade	Average Actual Enrollment <sup>1</sup>	Average Full-Time Equivalent <sup>1</sup>
Kindergarten	24	12.17
1	31	29.69
2	39	35.66
3	25	23.75
4	52	50.48
5	36	33.56
6	40	37.52
7	27	26.95
8	51	47.70
9	46	43.53
10	47	45.61
11	39	36.10
12	51	44.44
<b>Total</b>	<b>508</b>	<b>467.15</b>

Source: Stewart 2009

Note:

<sup>1</sup> Enrollment for the Dayton County School was provided for each grade per month. Monthly enrollment and FTE numbers were averaged together to provide the numbers in this table. Because these numbers are averaged, the numbers in the columns may not add up exactly to the totals.

**Table 2-38 Actual Enrollment for the 2008-2009 School Year, Pomeroy School District, Garfield County**

Grade	Average Actual Enrollment <sup>1</sup>
Kindergarten	7
1	19
2	29
3	21
4	24
5	21
6	26
7	26
8	27
9	29
10	24
11	34
12	32
<b>Total</b>	<b>317</b>

Source: Ruchert 2009

Note:

<sup>1</sup> Because enrollment numbers for each grade are averaged, the numbers in the columns may not add up exactly to the totals.

<sup>2</sup> FTE numbers were not available for Garfield County, Pomeroy School District #110.

**2.12.1.5 Wastewater**

Businesses and residences in the unincorporated parts of both Columbia and Garfield counties are served by private septic tank and drain field systems.

Tucannon and Oliphant Ridge WRAs (Columbia County)

The incorporated area of the city of Dayton in Columbia County is served by a collection system and wastewater treatment plant (WWTP), which provides treatment via a trickling filter system. Treated effluent is disinfected by an ultraviolet system before being discharged to Touchet River. Dayton's WWTP was constructed in 1938 and upgraded in 2000. Most of the residences in Dayton are connected to the wastewater treatment system; the remaining residences within the city limits are anticipated to be connected to the system in the near future. Incorporated areas within the town of Starbuck are served by individual on-site septic systems (Columbia County 2007).

Kuhl Ridge, Dutch Flats, and Oliphant Ridge WRAs (Garfield County)

A wastewater collection system and WWTP serve the incorporated area of the city of Pomeroy in Garfield County. The WWTP was originally constructed in 1951 and reconstructed in 2002. Currently, the WWTP has a total capacity of 810,000 gpd and provides secondary wastewater treatment via a bio-filter and second stage aeration. Treated effluent is disinfected by an ultraviolet system before being discharged to Pataha Creek. The reconstructed WWTP was designed to serve 1,770 residents (Pomeroy had 1,525 residents in 2008). The city anticipates that areas currently not served by the wastewater collection system that lie within the city's Urban Growth Boundary will be provided wastewater collection service in phases as future development warrants extension of public services (Garfield County 2008a).

**2.12.1.6 Solid Waste Disposal**Tucannon and Oliphant Ridge WRAs (Columbia County)

No landfills are located in Columbia County. Columbia County owns and operates a solid waste transfer station with compaction capability (Columbia County 2007). Municipal solid waste from Dayton is transported to Sudbury Road Landfill, located west of the city of Walla Walla in neighboring Walla Walla County (City of Walla Walla 2009). Municipal solid waste from unincorporated areas of Columbia County is transported directly to the landfill (Columbia County 2007). In addition to municipal (household) solid waste, the Sudbury Road Landfill accepts construction and demolition debris, such as oil, cement, concrete, rock, and asphalt. The landfill currently covers approximately 800 acres and receives on average 55,000 tons of solid waste per year (about 150 tons of solid waste per day). The landfill is able to expand into another 700 acres as needed, and *The Walla Walla Urban Area Comprehensive Plan 2007 Review and Update* estimates that the capacity of the landfill will be sufficient for approximately another 950 years (Peter J. Smith & Company, Inc. 2008).

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### Kuhl Ridge, Dutch Flats, and Oliphant Ridge WRAs (Garfield County)

No landfills are located in Garfield County. One county owned and privately operated transfer center is located in Garfield County on Bell Plain Road. The transfer center does not accept all waste products. Prohibited waste products include liquids, sewage sludge, batteries and paint (Garfield County 2009b).

#### **2.12.2 Impacts and Mitigation**

The discussion of direct impacts focuses primarily on the capacity of existing public services and utilities to accommodate increased demand during construction and operation of the Project. Local public services and utilities will experience higher demand during construction than during operation of the Project, because more people will be on-site and more activity will be occurring during the construction period. Indirect impacts to the capacity of local public services and utilities will occur due to temporary and permanent population growth associated with the Project. Temporary population growth will occur during each construction phase; most construction personnel are expected to leave the area upon completion of construction. Operation of the Project is expected to result in a small increase in the regional population level, which will subsequently generate an increased demand for public services and utilities.

At the end of its design life, decommissioning or repowering the Project will generate similar impacts to those discussed under Construction Impacts. Operation of the facility beyond its design life would not generate the need for expansion of any public services or utilities.

##### **2.12.2.1 Preferred Alternative**

#### ***Construction Impacts***

Impacts will be discussed first for the Columbia County portion of the Project, followed by a discussion of the Garfield County portion and its associated public services and utilities.

### Tucannon and Oliphant Ridge WRAs (Columbia County)

#### **Fire and Emergency Services**

Though the Project is located in areas within the jurisdiction of Columbia County Fire Districts #1 and #3 and Walla Walla/Columbia County Fire District #2, the Project will be constructed in rural, hard to access parts of the county where minimal fire and emergency response has previously been required. Construction of the Project will open up the area requiring fire and emergency response and will increase the number of people and miles of road access within the response area. Construction of the Project will be done by phase; however, it is likely that construction will occur simultaneously within adjacent WRAs. Thus, the demand for fire and emergency services will vary throughout the construction period based on the geographical area under construction.

## **2. Affected Environment and Impacts Public Services and Utilities**

Because construction will occur in rural lands susceptible to wildland fires, there will be an increased potential for emergency calls in more remote areas. Construction of the Project and other wind energy facilities in the county could require the Columbia County fire districts to develop contingency plans with mutual aid partners to provide response to multiple emergencies within required response times (Columbia County Fire District #3 2009). Although construction of the Project will increase the area of Columbia County requiring fire and emergency response, new roads constructed at the Project site may act as a fire break as well as facilitate emergency vehicles' access into the area.

Emergency preparedness and emergency access measures proposed by the Applicant will reduce potential impacts to surrounding property and people and rescue personnel in the event of an emergency. These measures are discussed further under Mitigation and in Section 2.16 Health and Safety.

Primary response for structure and wildland fires at the Project will come from Fire District #3 wildland units stationed at Dayton and Turner as well as a structure fire engine from the Dayton station. Secondary response will be provided by Fire Districts #1 and #2. Fire District #3 has indicated that the lack of water supply at the Project will reduce the effectiveness of fire response and increase costs for the district (Columbia County Fire District #3 2009). The fire district's three water tenders have a combined capacity of 4,500 gallons of water, which will not be adequate to respond to a large fire. In the event of a fire at the Project, the water tenders will fill wildland engines at the fire before returning to Dayton or another designated fill site for water. Fire District #3 could potentially be required to purchase an additional water tender with revenues generated by property taxes from the Project to meet response needs at the Project (Columbia County Fire District #3 2009). *See also* Mitigation at the conclusion of Section 2.12.2.1 Preferred Alternative for further discussion.

Rural ambulances are required to respond to any emergency within 45 minutes (Washington Department of Health WAC 246-976-390; Columbia County Planning Department 2009). Columbia County Fire District #3 would be the primary responder for ambulance and rescue requests for most of the Project within Columbia County, including search-and-rescue response in the Umatilla National Forest and other wilderness areas. Walla Walla/Columbia County Fire District #2 and Waitsburg Ambulance Service would be the primary responders in the southwestern part of the Tucannon WRA. In addition to potentially increased ambulance and rescue requests at the Project, increased search-and-rescue response could potentially be required due to use of wilderness areas by personnel during the construction phases (see Section 2.14 Land Use and Recreation Recreation for further discussion). In order to meet the standard for emergency response, the primary responder could have to rely on a mutual aid partner to respond to emergencies at the Project. Columbia County Fire District #3 could also have to purchase a third ambulance, a second light rescue truck, or a

## **2. Affected Environment and Impacts Public Services and Utilities**

combined rescue/ambulance vehicle to respond to increased requests for service in rural areas of the county with revenues generated by property taxes from the Project (Columbia County Fire District #3 2009). *See also*, Mitigation at the conclusion of Section 2.12.2.1 Preferred Alternative for further discussion.

### **Police**

Traffic volume will increase on local roadways surrounding the Project during the construction phases due to commuting construction workers and the transportation of materials, but is not expected to significantly impact roadways (see Section 2.13 Traffic and Transportation). Traffic accidents and calls for service on U.S. Route 12 and county roads could potentially increase during construction, as the construction phase represents the peak in terms of workers commuting to the site and travel onsite.

Some construction workers are anticipated to relocate temporarily to the local area. Police response would mainly be required in the event of traffic-related incidents. Increased search-and-rescue response could potentially be required due to increased recreational use of wilderness areas by personnel during the construction period (see Section 2.14 Land Use and Recreation for further discussion). No additional personnel, holding facilities, vehicles, or equipment are anticipated to be required during construction of the Project. The Project will provide its own onsite security, to be present during construction and operations.

### **Medical Services**

Demand for emergency medical services could increase slightly due to construction accidents that could occur at the Project. Potential hazards at construction sites will include equipment failure, natural disaster, and human-caused accidents. The Fire and Response Plan developed for the Project will include procedures to follow in the event of a medical emergency. Implementation of preventative safety measures would minimize serious injury accidents requiring EMS response. *See* Mitigation at the conclusion of Section 2.12.2.1 Preferred Alternative for further discussion.

Dayton General Hospital currently has an adequate number of acute and swing patient beds to accommodate the temporary increase in local population during the construction period. However, the hospital currently has Level V Trauma Center emergency room and has identified a need to construct a second. The hospital's existing emergency room can accommodate one patient at a time. Therefore, in the event of an emergency at the Project, transportation by ambulance or helicopter to regional hospitals with Level III or Level II Trauma Centers will be required. The region is served by several Level III or Level II Trauma Centers; therefore, it is not anticipated that construction of the Project would generate the need for additional medical personnel or facilities.

## **2. Affected Environment and Impacts Public Services and Utilities**

### **Schools**

Some construction workers will temporarily relocate to and reside in Garfield, Columbia and surrounding counties on a temporary basis during Project construction. In past projects up to 30% of the total construction workforce was hired locally. Of the remainder, up to half may temporarily relocate to the area, some of which will bring family and dependents with them (see Section 2.15 Socioeconomics, for further discussion). Given past experience with other wind development projects in the region, however, these temporarily relocated workers have not had a significant impact on enrollment in area school districts. The small increase in enrollment will not exceed the capacity of local school districts.

### **Wastewater**

No significant impacts to community wastewater treatment systems are anticipated because the Project would not be connected to a sewer system during construction. Sanitary wastes will be collected in portable toilets during construction. Disposal of sanitary wastes will be managed through a contract with a portable toilet waste vendor. The contractor will incorporate applicable state capacity requirements based on the construction worker population on the Project site at any given time. Collected wastes will be managed and disposed of by the contracted vendor.

On-site septic systems will be installed at O&M facilities. The Applicant will consult with the Columbia County Health District and will obtain any required permits for septic systems prior to construction.

### **Solid Waste Disposal**

A private contractor will be hired to transport construction debris to a regional landfill for disposal. During construction, the primary wastes generated will be solid construction debris such as cardboard, scrap metal and plastic. Hazardous materials, such as oil, would be disposed of in accordance with all applicable state and federal laws and regulations. The closest landfill to the WRAs in Columbia County is Sudbury Road Landfill in the city of Walla Walla (Walla Walla County). In addition to municipal solid waste Sudbury Road Landfill accepts construction and demolition debris, such as oil, cement, concrete, rock, and asphalt. The landfill covers approximately 800 acres and accepts about 150 tons of solid waste per day. The landfill's existing capacity is sufficient to serve the region for approximately another 950 years, and another 700 acres is available for expansion of the landfill as needed. Construction of the Project will not generate enough solid waste to approach or exceed the existing capacity of the landfill.

### Kuhl Ridge, Dutch Flats, and Oliphant Ridge WRAs (Garfield County)

### **Fire and Emergency Services**

As noted in the Garfield County discussion above, construction of the Project in rural areas of Garfield County will increase the area of the county requiring fire and emergency response. Construction of the Project will be done by phase;

## **2. Affected Environment and Impacts Public Services and Utilities**

however, it is likely that construction will occur simultaneously within adjacent WRAs. Thus, the demand for fire and emergency services will vary throughout the construction period based on the geographical area under construction. Construction of the Project will increase the miles of road access and the number of people in the area under jurisdiction of Garfield County Fire District #1, which would be the primary responder for fires and other emergencies at the Project. Although construction of the Project will increase the area of Garfield County requiring fire and emergency response, new roads constructed at the Project site may act as a fire break as well as facilitate emergency vehicles' access into the area.

Emergency preparedness and emergency access measures proposed by the Applicant will reduce potential impacts to surrounding property, people and rescue personnel in the event of an emergency. These measures are discussed further under Mitigation and in Section 2.16 Health and Safety.

One additional factor affecting fire response at the Project will be the lack of water supply at the site, which will reduce the effectiveness of fire response and increase costs. Garfield County Fire District #1 does not operate any water tenders. In order to supply water to structure and brush fire engines at the Project, Fire District #1 could have to rely on a mutual aid partner for water supply or could be required to purchase additional equipment. Fire District #1 has mutual aid agreements with Columbia County Fire Districts #1 and #3, Whitman County Fire Districts #8 and #13 and Asotin County Fire District #1. As noted above, Columbia County Fire District #3 operates three water tenders with a combined capacity of 4,500 gallons of water, which the fire district has indicated is inadequate to respond to large fires (Columbia County Fire District #3 2009). Therefore, construction of the Project could result in a need for additional water tenders to provide a water supply for fires in rural areas or, alternatively, provision of water storage onsite to assist with emergency response. The cost of purchasing additional equipment will be offset by the increase in revenue generated by property taxes from the Project. *See also* Section 2.15 Socioeconomics.

Rural ambulances are required to respond to any emergency within 45 minutes (Washington Department of Health WAC 246-976-390; Columbia County Planning Department 2009). Garfield County Fire District #1 would be the primary responder for ambulance and rescue requests at the Project within Garfield County. In order to meet the standard for emergency response, Fire District #1 could have to rely on a mutual aid partner to respond to emergencies at the Project. Fire District #1 operates two BLS ambulances. The district has identified a current need to replace a light rescue truck that was recently lost. The district is in the process of acquiring one. It is expected that the new vehicle will be available prior to construction of the Project. Fire District #1 has not identified any needs for additional equipment that could arise from construction of the Project (Bunch 2009).

## ***2. Affected Environment and Impacts Public Services and Utilities***

### **Police**

Impacts to Garfield County police service as a result of Project construction will be similar to those described under Columbia County, due to the similar scale and duration of construction activities. The Project will provide its own onsite security, to be present during construction and operations.

### **Medical Services**

A health and safety plan will be developed for the Project, and in the event of a medical emergency at the Project, the Health and Safety Plan will guide the response.

Garfield County Memorial Hospital currently has nine beds and a Level V Trauma Center emergency room. No existing capacity, personnel or facilities, issues at the hospital have been identified.

### **Schools**

Impacts to Garfield County schools as a result of Project construction would be similar to those described under Columbia County.

### **Wastewater**

No significant impacts to community wastewater collection systems are anticipated because the Project would not be connected to a sewer system during construction. Sanitary wastes will be collected in portable toilets during construction. Disposal of sanitary wastes will be managed through a contract with a portable toilet waste vendor. The contractor will incorporate applicable state capacity requirements based on the construction worker population on the Project site at any given time. Collected wastes will be managed and disposed of by the contracted vendor.

On-site septic systems will be installed at O&M facilities. The Applicant will consult with the Garfield County Health District and would obtain any required permits for septic systems prior to construction.

### **Solid Waste Disposal**

A private contractor would be hired to transport construction debris to a regional landfill for disposal. Hazardous materials, such as oil, would be disposed of in accordance with all applicable state and federal laws and regulations. The closest landfill to the WRAs in Garfield County is Asotin County Landfill, located west of Clarkston. The landfill has a total area of 76 acres; approximately 30 acres, consisting of three cells, are currently open for solid waste disposal. Construction on a fourth cell is anticipated to begin in 2015 and be complete by 2017. Asotin County Landfill accepts approximately 48,000 tons of solid waste per year (Asotin County Public Works 2009). The landfill has adequate capacity to accept construction debris from the Project. Construction debris could also be



## **2. Affected Environment and Impacts Public Services and Utilities**

transported to Sudbury Road Landfill in Walla Walla, which also has adequate capacity.

### ***Project Facility Impacts***

#### All Four WRAs

#### **Fire and Emergency Services**

As noted under Construction Impacts, the Project will increase the areas requiring fire and emergency response in each county. Impacts from a turbine or wildland fire could be more severe unless provisions are made to facilitate access to the Project for firefighting units. Access provisions for the Project are further described under Mitigation. An increase in emergency calls over a larger area could result in the need for fire and emergency services in both counties to purchase additional equipment in order to effectively respond. Potential equipment needs are identified and discussed under Construction Impacts and include additional ambulances and water tenders. It is assumed that the operational needs will be equivalent to those discussed under construction, as they both pertain to an increase in the area of response.

An aggregate local staff of 89 people total will be involved in the day-to-day management, operation, and maintenance of the Project. Permanent employees relocating to the area could reside in either county or in surrounding counties and cities within commuting distancing, including Walla Walla County, Asotin County, Whitman County, and the cities of Walla Walla and Clarkston. The increase in regional population during Project operation is not anticipated to generate the need for additional fire and emergency personnel, equipment, or facilities.

#### **Police**

Day-to-day management, operation, and maintenance of the facility will require a local staff of 89 people total for the Project, who would be on-site approximately 40 hours per week. Fewer daily vehicle trips will be required during operation of the facility than will occur during Project construction; therefore, the potential for traffic accidents and other calls for service will be less. Operation of the facility is not anticipated to generate the need for additional personnel, holding facilities, vehicles, or other equipment in either county.

Permanent employees relocating to the area could reside in Columbia County or Garfield County or other cities and counties within commuting distance, which would reduce the actual population increase in individual cities and counties. This small population increase will not exceed the capacity of local police services.

#### **Medical Services**

A number of hospitals and medical clinics are located in the region and could accommodate the medical needs of the operational staff. As noted under

## **2. Affected Environment and Impacts Public Services and Utilities**

Construction Impacts, both Dayton General Hospital and Garfield County Memorial Hospital have Level V Trauma Centers, each with one emergency room. In the event of an emergency involving multiple victims at the Project, trauma patients will be transported by ambulance to the closest hospital to be stabilized before air transport to the nearest Level III or Level II Trauma Center. Operation of the Project is not anticipated to generate the need for additional medical personnel, facilities, or equipment in either county.

Project personnel and their dependents will have access to a number of hospitals and additional medical clinics located in the region. The increase in regional population during Project operation will not exceed the capacity of regional medical services.

### **Schools**

Day-to-day management, operation, and maintenance of the facility will require a local staff of 89 people total for the Project. Permanent employees relocating to the area could reside in Columbia County or Garfield County or other cities and counties within commuting distance. A small number of school-aged children may become pupils and enroll in either Garfield (Pomeroy) and/or Columbia (Dayton) school districts or school districts in nearby counties (see Section 2.15 Socioeconomics). Observers in Columbia County have noted that permanent personnel employed by existing wind facilities in the county tend to be younger and are starting families in the region (see Section 2.15 Socioeconomics for further discussion). Therefore, it is anticipated that increases in school enrollment will occur mainly in the kindergarten and elementary school grades. The small increase in enrollment will not exceed the capacity of local school districts.

### **Wastewater**

Operations and maintenance facilities at the Project will be served by on-site septic systems. The septic systems will be installed according to County and State regulations and in compliance with all required permits. Therefore, the Project will not require extension of public wastewater collection facilities and will not increase the demand on local WWTPs.

The increase in regional population during Project operation is not anticipated to generate the need for additional personnel or construction of new wastewater collection facilities.

### **Solid Waste Disposal**

Day-to-day operation of the Project will generate minimal amounts of solid waste. Solid waste will be collected and stored onsite prior to transport by a contractor to the nearest regional landfill. Hazardous materials, such as oil, would be disposed of in accordance with all applicable state and federal laws and regulations. The closest regional landfills to the Project are Asotin County Landfill and Sudbury Road Landfill in Walla Walla. Both landfills have adequate capacity to accommodate solid waste from the Project.

## **2. Affected Environment and Impacts Public Services and Utilities**

Regional population is estimated to increase during operation of the Project (see Section 2.15 Socioeconomics for further discussion). This increase in population will not increase the amount of municipal solid waste generated to the point that additional personnel or equipment or landfill expansion will be required.

### ***End of Design Life Impacts***

At the end of its design life, the Project could be repowered, decommissioned, or continue to operate as-is, if the condition of the equipment warrants. Repowering or decommissioning the Project will generate impacts to public services and utilities similar to those described under Construction Impacts. Operation of the facility beyond its design life will generate impacts similar to those described under Project Facilities Impacts. Repowering or continuing to operate the facility will not increase regional population sufficiently to require expansion of public services or utilities. Decommissioning the facility could result in a slight decrease in regional population, thereby decreasing the demand for public services and utilities. Decommissioning the facility will also reduce the revenue generated from property taxes in each county, thereby reducing the revenue available to maintain public services and utilities. If the Project is decommissioned, waste material will be recycled, disposed of onsite or taken to a regional facility for disposal.

### ***Mitigation***

The increased demand for public services and utilities during construction and operation of the Project will be mitigated by the increase in the local property tax base generated by the Project. There will also be an increase in revenues from property and sales taxes due to increased employment and spending. A more detailed discussion of these impacts is provided in Section 2.15 Socioeconomics.

Facility personnel will complete regular emergency response and safety training to ensure that effective and safe action is taken to reduce the risk of on-site emergencies and limit the impact to Project facilities and surrounding properties should an emergency occur. A Health and Safety Plan has been developed for the Project and will be implemented during both construction and operation of the facilities (see Section 2.16 Health and Safety). The Health and Safety Plan describes the structural and behavioral safety measures that will be used at the Project.

Preventative safety measures will be employed at the Project to reduce the risk of fires or to safely contain a fire if one should occur. Lightning protection systems will be installed in all turbines and towers to reduce the risk of a lightning-caused fire. Lightning-caused fires occur most frequently in timbered areas and are rare at the Project site, which is covered mainly with agricultural crops and low scrub

## **2. Affected Environment and Impacts Public Services and Utilities**

and grass vegetation. Fires in modern turbine nacelles due to mechanical failures are also rare.

The Applicant will initiate discussions with local fire districts prior to construction for ongoing fire protection services during construction and operation of the Project. These discussions will include the development of a Fire and Emergency Response Plan in conjunction with the county fire districts and other appropriate emergency response agencies in order to address chemical, electrical and wildland fires and other emergencies. The Fire and Emergency Response Plan shall include plans for the coordination with local fire and emergency services districts related to necessary measures to provide adequate access to the site for fire and emergency vehicles and identification of Project structures and facilities that would require response. These measures will include regular maintenance of Project access roads and could additionally include maintaining the access road widths required during construction to accommodate firefighting equipment. Additional mitigation measures could include:

- Providing detailed maps to local fire and emergency services districts showing all Project access roads;
- Use of spark arresters on all power equipment during extremely dry conditions when the wildland fire risk is elevated;
- Carrying fire extinguishers in construction and maintenance vehicles; Maintaining a water supply or water tender at one or more locations on-site to improve the effectiveness of fire fighting; and
- All Project operations employees are responsible for contributing to ongoing fire and emergency prevention in the Project area through the following programs:
  - Operational Safety Program
  - Emergency Action Plan
    - Onsite emergency plans would be prepared for the Project in case of a major natural disaster relating to or affecting the Project, describing the emergency response procedures to be implemented on-site during various emergency situations that may affect the Project and surrounding area.
  - Onsite Fire Prevention Plan
- Provide onsite water storage size and location to be determined in consultation with fire districts.

Safety measures are further discussed in Section 2.16 Health and Safety.

### **2.12.2.2 No Action Alternative**

Under the No Action Alternative, the Project will not be constructed or operated, and the direct and indirect impacts to public services and utilities described in this section will not occur. Economic benefits to the local economy will not be realized through an enhanced tax base and increased local revenues or through the creation of temporary and permanent jobs.

## **2. Affected Environment and Impacts Public Services and Utilities**

### **2.12.2.3 Probable Significant and Unavoidable Adverse Impacts**

As mitigated, the Project will have no probable significant and unavoidable adverse impact to public services and utilities.

### **2.12.2.4 Cumulative Impacts**

Similar direct impacts, including potential increases in demand for fire and emergency services in rural areas of Columbia and Garfield counties, would be associated with the development of other potential regional energy projects, proposed as potential interconnection requests in both counties (see Table 2-1). The potential wind energy facilities will be dispersed across rural areas that are relatively hard to access and have an elevated risk for wildland fires, due to the arid climate and the land cover of bunch grass and scrub vegetation and wheat crops that burn hot and rapidly (Columbia County Fire District #3 2009). Due to the potential for increased emergency calls over a wider response area, local fire and emergency districts could be required to purchase additional equipment and vehicles to comply with state standards for response times. Equipment needs that have been identified by each county are discussed in Section 2.12.2.1, Preferred Alternative, Construction Impacts. The cost of purchasing additional equipment would be offset by the increase in revenue generated by property taxes from each wind energy facility.

The relatively small number of full-time permanent employees, estimated at total of 89, will not create a cumulative demand for public services and utilities beyond their existing capacities. A portion of these permanent employees will be hired locally. Employees relocating to the local area could reside in Columbia or Garfield counties or surrounding counties and cities within commuting distance, which would reduce the actual population increase in individual counties and cities. All future wind energy projects would be reviewed by the appropriate county jurisdictions under the review processes promulgated by those jurisdictions.

In addition to the potential wind energy projects described above, two other development projects are proposed for Columbia County. A site has not yet been identified for the proposed 30-acre private industrial development, Blue Mountain Station, but it is assumed that it will be sited within the Urban Growth Boundary of Dayton, and would thus be within existing utility service areas.

Assuming that it is located within the Urban Growth Boundary, Blue Mountain Station should not expand the area within the county where fire and emergency response is required. The second proposed project is the construction of the Columbia County Transportation building within the existing Port of Columbia Industrial Park. The Port of Columbia Industrial Park is currently served by public utilities; therefore, extension of utility lines will not be required. Construction and operation of the new building is not likely to significantly increase the need for fire protection and emergency services.

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## ***2. Affected Environment and Impacts Public Services and Utilities***

Indirect impacts to public services and utilities generated by these two development projects during operation as a result of increased employment and subsequent population growth cannot be determined, because the number of people that could be employed by each project is unknown. While both projects could hire some of their employees locally, each could also draw employees from outside the region. Population growth in Columbia County, and subsequent demand for public services and utilities, as a result of these two proposed developments will likely be offset by some employees choosing to live in the city of Walla Walla, which is within commuting distance.

## **2.13 Traffic and Transportation**

### **2.13.1 Affected Environment**

Primary transportation corridors in the Project area include U.S. Route 12, SR 127, and SR 261, and a combination of existing private and county roads.

#### **2.13.1.1 Applicable Regulations, Plans, Policies**

##### Garfield County - Kuhl Ridge, Dutch Flats, and Oliphant Ridge WRAs

Information regarding roadway design, roadway setbacks, and other pertinent data is summarized below. Please see Appendix F for additional information regarding Garfield County Comprehensive Plan policies for transportation and an overview of the county road standards.

##### **Garfield County Roadway Design**

County road standards apply to the new construction or reconstruction of public and private roadways within Garfield County. Design plans for new or reconstructed Project roadways will be submitted to and approved by the County Engineer prior to construction. Roadway designs will be prepared under the supervision of and certified by a licensed professional engineer.

##### **Garfield County Zoning Ordinance**

According to the Garfield County Zoning Ordinance transportation section, the Applicant will be required to develop Haul Road Agreement that includes both construction and post construction uses. The Haul Road Agreement will include the elements identified in Table 2-39.

**Table 2-39 Haul Road Agreement Requirements**

Specified Requirements
Specific roads description (pre and post construction)
Types of activities and uses on the roads
Types of products, equipment, materials and/or supplies to be transported and estimated quantities
Vehicle trip per day of travel
Gross weight loadings
Vehicles types, trailers, and combinations
Post construction access requirements for utility vehicles
Identification of potential impacts (during and after construction)
Impact Mitigation Measures and maintenance and repair plans

Source: Garfield County Zoning Ordinance, 2008

##### **Applicable Setbacks**

As per Chapter 1.01.030 of the Garfield County zoning ordinance, the height of a turbine is defined as the “distance measured from the ground level to the highest point on a wind turbine, including the rotor blades”. This is measured as the

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distance from the ground to the tip of the blade at its highest point. County roads and Project area boundary's setback criteria are shown below in Table-40.

**Table 2-40 Garfield County Setbacks for Wind Energy Facilities**

Element	Required Setback
Highway 12	Outside of the Urban Growth Area: height of the wind energy tower plus 100 feet.
County Roads	From the rights-of-way of all county paved or bituminous-surfaced roads: height of the wind energy tower plus 100 feet.  From the rights-of-way of all county gravel or unpaved roads: 100 feet from the closest blade tip of the wind energy tower.
Project Area Boundary	Height of the wind energy tower plus 100 feet, unless waived.

*Source: Garfield County Zoning Ordinance, 2008.*

### Columbia County - Tucannon and Oliphant Ridge WRAs

The Project will comply with Columbia County road standards for both improvements to and new construction of public and private roads. The Columbia County Commercial Wind Turbine Energy Project Standards also contain a transportation element which is addressed in this analysis. Please see Appendix F for additional information regarding Columbia County Comprehensive Plan policies for transportation and an overview of the county road standards.

The Applicant will address haul road and other access issues through the CUP process in Columbia County and through a bonding requirement.

### **Columbia County Roadway Design**

The Columbia County Standards for Design and Construction of Roads (July 2009) include roadway design guidelines which apply to the new construction or reconstruction of County roadways, and public or private roadways within Columbia County. Design plans for new or reconstructed Project roadways will be submitted to and approved by the County Engineer prior to construction. Roadway designs will be prepared under the supervision of and certified by a licensed professional engineer.

### **Columbia County Commercial Wind Turbine Energy Projects Standards of Development**

Columbia County's adoption of the Zoning Ordinance (2008) establishes a setback from paved county roads and state highways of a minimum of 1.5 times the height of a wind turbine, measured from the natural surrounding grade to the highest extent of any blade.



**2.13.1.2 Existing Road Network**All Four WRAs**Existing State Roadways Located in the Project Area*****U.S Route 12***

U.S. Route 12 is a Class I Managed Access Highway with a general posted speed limit of 60 mph. U.S. Route 12 provides access to the Tucannon, Kuhl Ridge, and Oliphant WRAs.

***State Route (SR) 127***

State Route (SR) 127 is a Class 2 Managed Access Highway with a posted speed limit of 55 mph. SR 127 provides access to the Kuhl Ridge and Oliphant WRAs.

***SR 261***

SR 261 is a Class 2 Managed Access Highway with a posted speed limit of 55 mph. SR 261 provides access to the Tucannon WRA.

Any private access to the State Routes listed above will require necessary access permits obtained through WSDOT.

**Existing County Roads Located in the Project Area**

Existing county roads located in the Project area include but are not limited to Smith Hollow Road and McDay Alto Road, maintained by Columbia County, and Hagen Road, New York Gulch Road, Kuhl Ridge Road, Dutch Flats Road, Brown Gulch Road, maintained by Garfield County. Both counties maintain portions of Emerson Road and West Oliphant Ridge Road. A complete listing of existing roads is provided in Table 2-42.

**Primitive Roads**

A primitive road is a minor road system with less than 100 vehicle trips per day and is generally not graveled or paved. Primitive roads in the Project area include, but are not limited to, the East and West Oliphant Roads serving Tucannon and Oliphant Ridge WRAs. Primitive roads are closed for the winter; however, in Columbia County, primitive roads are maintained and several of these roads are kept open during the winter if they service a residence.

**2.13.1.3 Traffic Volumes**

Appendix F contains information, including tabular data, to speak to existing traffic volumes within the Project area.

**2.13.1.4 Existing Roadways LOS**

LOS is a qualitative measure describing operational conditions in a traffic stream and motorists' or passengers' perceptions of those conditions. It generally describes traffic conditions in terms of speed and travel time, freedom to

## **2. Affected Environment and Impacts Traffic and Transportation**

maneuver, traffic interruptions, comfort, convenience, and safety. There are six LOS classifications, each given a letter designation from A to F. LOS A represents the best operating conditions and LOS F represents the worst. LOS is assigned to road sections based on the most current Highway Capacity Manual (HCM) (Transportation Research Board [TRB] 2000).

### Tucannon and Oliphant Ridge WRAs (Columbia County)

Existing Columbia County roads in the Project area, East Oliphant and Oliphant Roads, operate at LOS A (Columbia County Engineer Pers. Comm. 2009).

### Kuhl Ridge, Dutch Flats, and Oliphant Ridge WRAs (Garfield County)

According to the Garfield County Comprehensive Plan's Transportation Element, Garfield County considers that LOS D at peak hour is a reasonable and achievable standard for the major arterial roadways. All of the roadways in the Project area currently operate at a LOS of A (Garfield County Engineer Pers. Comm. 2009).

#### **2.13.1.5 Roadway Limitations**

RCW 46.44.090, "Special Permits for Oversize or Overweight Movements," allows special permits to be issued for vehicles exceeding the maximum size/weight/load limits.

RCW 46.44.041 specifies the maximum legal load as 105,500 lbs. Because some construction transport vehicles related to the Project may exceed this weight limit, a special permit in accordance with RCW 46.44.090 will be obtained, and any required county permits for overweight limits will also be obtained.

As per the Garfield County Zoning Ordinance, Section 1.05.090, Conditions of Approval for Transportation, contractors must comply with all applicable road restrictions for public roadways during periods of construction or maintenance of the Project. Any damage to public roadways caused by a violation of applicable road restrictions will be the responsibility of the contractor. In addition, compliance with seasonal road restrictions implemented by Garfield County will be required.

#### **2.13.1.6 Highway Safety / Road Hazards**

The Project's Haul Road Agreement in Garfield County (including road use agreement) and CUP and bonding requirements in Columbia County will include measures directed at preventing any work zone collisions during the construction phase of the Project.

#### **2.13.1.7 Public Transportation**

##### All Four WRAs

Garfield County Public Transportation (GCPT) provides transit services to local citizens through the Senior Assistance program. Garfield County operates its intercity route (Pomeroy/Lewiston, Idaho) on Tuesdays and Thursdays and some

## **2. Affected Environment and Impacts Traffic and Transportation**

Saturdays. GCPT provides dial a ride services to the general public in the Pomeroy area Monday through Friday and some Saturdays.

Columbia County Public Transportation (CCPT) operates paratransit (dial a ride) services, Monday through Friday, in Dayton and the outlying areas of Columbia County.

CCPT is the only public transportation available to the residents of Columbia County, as well as to residents of Waitsburg and Prescott in neighboring Walla Walla County.

### **2.13.1.8 Air Traffic**

#### All Four WRAs

Garfield County does not have its own public airfield, but is served by both the Walla Walla Regional Airport and the Lewiston-Nez Perce County Regional Airport. Both are served by the Garfield County Public Transportation. These airports are approximately 34 miles southwest of the four WRAs. In addition, five private airfields are located in Garfield County for crop dusting operations and private use.

Columbia County does not have its own public airfield, but is served by both the Walla Walla Regional Airport and the Pasco Airport.

### **2.13.1.9 Freight and Rail Traffic**

#### All Four WRAs

According to the Eastern Washington Intermodal Transportation Study (EWITS) conducted in the State of Washington, the main truck route in Columbia and Garfield counties is U.S. Route 12. Additional state routes used for hauling freight in Columbia and Garfield counties are SR 127 and 261. Currently, there is no rail operation in Garfield County. There is one railroad in Columbia County, the Blue Mountain Railroad, which is a short line that services the City of Dayton (Columbia County 2007).

### **2.13.2 Impacts and Mitigation**

The Project will be constructed in 4 or more phases, commencing in 2010 and continuing each year thereafter. Multiple phases will extend the length of time of the impacts and reduce any potential impact within each phase of development. The traffic generated by the Project is not significant enough to justify a traffic impact analysis (TIA) study; therefore a TIA will not be prepared for Project.

#### **2.13.2.1 Preferred Alternative**

Direct impacts will occur if predicted traffic levels exceed applicable LOS standards. Other types of direct transportation impacts include the potential for vehicles hauling material to the Project site exceeding legal roadway load and

## **2. Affected Environment and Impacts Traffic and Transportation**

weight limits and accident or navigational hazards (for both motorists and aviators). For the Project, the primary concern is the potential transportation-related impacts attributable to vehicle trips (both trucks and automobiles) associated with construction, operations and maintenance, and decommissioning of the various Project elements. Potential aviation hazards will be specifically associated with the proposed turbine and meteorological towers. Indirect impacts are not anticipated because the Project is not expected to substantially induce regional growth to the extent that would result in significant changes to off-site traffic.

### **Construction Impacts**

#### All Four WRAs

##### **New Permanent Roads**

The Applicant will prepare a site access plan that designates roads and directs construction and maintenance workers to use existing roads wherever possible.

Approximately 120 miles of new permanent roads will be constructed for the entire Project. In areas where existing roads do not provide access, new graveled roads will be needed. Generally, these new roads will be 20 feet wide, with additional 5-foot permanent shoulders on each side. An additional 5-foot temporary shoulder on each side may be needed during construction. The temporary shoulders will be reclaimed upon completion of construction and returned to their original use. During construction, some roads may need additional temporary shoulders for turn-around areas for larger vehicles. These areas will also be reclaimed upon completion of construction. New roads will be constructed and maintained in compliance with state and county regulations and with approval of the Garfield and Columbia county engineers. The final roads layout will be provided once the final engineering drawings are complete and will be submitted to Garfield and Columbia counties with the appropriate permit applications. In particular, access to new, Project phase-related roads will solely be from county and private roads and would not be from U.S. Route 12.

##### **Temporary Access Roads**

In addition to new permanent roads, it may be necessary to construct temporary access roads for construction. When grading such roads, the topsoil will be stripped and stockpiled for restoration once construction is completed. All temporary roads and disturbance areas will be restored to their original condition upon completion of construction. It is estimated that 83 miles of temporary roads will be needed for the entire Project.

##### **Traffic**

The Project construction period requiring the transportation of major equipment and constituting the highest amount of traffic will be approximately 12 months per phase. U.S. Route 12 will be the primary roadway to and from the Project site

## 2. Affected Environment and Impacts Traffic and Transportation

and will likely receive the largest increase in traffic volume from construction of the Project. The appropriate road access permits will be obtained by the Applicant prior to construction activities.

### Construction Truck Traffic

Construction-related traffic increases will consist of construction employee transportation and deliveries of Project equipment and construction materials (such as water and steel) by truck. Truck trips are converted to passenger-car equivalent trips using a passenger-car equivalent factor of 2.5. The Highway Capacity manual uses a general factor of 1.5 for trucks. On large grades, higher truck equivalent factors are used, but generally do not exceed 3, except in mountainous areas. To account for larger trucks and some grades, a 2.5 factor was used as a conservative estimate. This would account for the fact that long trucks (for oversize and heavy loads) take up more physical space and generally operate at lower speeds than passenger vehicles. Using the 2.5 truck equivalent factors, the total number of passenger car equivalent trips expected during the construction period is 473.

At the peak month of construction (peak construction period), it is expected that about 160 personnel will be onsite at once as multiple disciplines of contractors complete their work simultaneously. All employees are assumed to work single 10-hour shift, 5 to 6 days per week, as the work demands, for the duration of Project construction. During the peak construction period, construction workers will generate an estimated 214 daily trips (assuming one-third of the workforce would carpool to the site), 107 of which will occur during the evening peak hour. These construction worker trips will consist of light-duty vehicles, which would travel on existing state highways and county roads and newly erected construction roads through the WRAs.

Table 2-41 provides estimates for vehicle trips generated during Project construction.

**Table 2-41 Project Construction Trip Generation**

Employee Traffic	795 turbines/2.5 MW
Daily Trips	214
PM peak-hour trips	107
Light Duty Delivery Trucks	
Daily Trips	6
PM peak-hour trips	1
Heavy Duty Delivery Trucks	
Daily truck trips (without multiplier)	101
PM peak-hour trips	51
Total Construction Trips	
Daily trips	321
PM peak-hour trips	159

## **2. Affected Environment and Impacts Traffic and Transportation**

It is anticipated that truck deliveries will include the following:

- major equipment (e.g., tower sections, nacelles, blades);
- water trucks for road wetting during compaction, mixing concrete; and for dust control;
- fuel trucks for replenishing diesel and gasoline storage tanks;
- cement, sand, and aggregate for use in concrete foundations and trench shading;
- construction equipment delivery and pickup;
- reinforcing steel;
- mechanical equipment;
- electrical equipment and material (e.g., transformers, cable);
- miscellaneous steel, roofing, and siding;
- construction consumables; and
- contractor mobilization and demobilization.

The wind turbines, towers, transformers, and other large equipment will be transported to the site using semi-trucks and lowboy trailers designed for heavy loads (i.e., multiple axles).

Construction of each phase will take approximately 12 months. Due to the unique nature of wind energy facility construction and operation, it is possible that some of the construction elements listed in this section will occur simultaneously. It is also possible that shared facilities will be used between Construction Phases. Delays in equipment delivery or weather may necessitate changes. To the maximum extent possible, deliveries will generally occur during normal construction hours; however, truck traffic may occur during off or nighttime hours.

The Applicant intends to utilize on-site gravel quarries at the Project location to supply construction gravel. These on-site gravel quarries will significantly reduce the number of heavy vehicles accessing the site, thereby improving traffic operations.

A preliminary list of roads that could potentially be used for construction and operation of the Project is provided in Table 2-42. This list is subject to revision during the development of the final engineering and site drawings.

The amount of traffic on these roads will increase, if used during construction; however, given the relatively low daily traffic counts on these roads (with the exception of U.S. Route 12, SR 127, and SR 261 which are addressed in Table 2-43), coupled with the limited amount of traffic over each construction phase (approximately 12 months) and the total number of construction phases (4 or more) spread out over time, temporary traffic delays are likely to occur at localized spots and will not be widespread.

## 2. Affected Environment and Impacts Traffic and Transportation

**Table 2-42 Proposed Roads for Project Use**

County	Road Name
Columbia	McKay-Alto
Columbia	Baker
Columbia	Bramhall (East and West)
Columbia	Brines
Columbia	Dingle
Columbia	Emerson
Columbia	Jackson Grade
Columbia	Kellogg Hollow
Columbia	Laib
Columbia	Mead
Columbia	Messner
Columbia	Oliphant
Columbia	East Oliphant Ridge
Columbia	Petticord
Columbia	Poulsen
Columbia	Prater
Columbia	Smith Hollow
Columbia	State Hwy 261
Columbia	Territorial
Columbia	Tucannon
Columbia	Turner
Columbia	U.S. Route 12
Columbia	Willow Creek
Garfield	4WD Road
Garfield	6 <sup>th</sup>
Garfield	Bartels
Garfield	Breakdown
Garfield	Brown Gulch
Garfield	Chard
Garfield	Dutch Flat
Garfield	Emerson
Garfield	Fairgrounds
Garfield	Falling Springs
Garfield	Freeburn
Garfield	Geiger Gulch
Garfield	Hagen
Garfield	Heaton Gulch
Garfield	Higg Hill
Garfield	Jackson
Garfield	Kuhl Ridge
Garfield	Linville Gulch
Garfield	Marengo
Garfield	Meadow Creek
Garfield	New York Gulch
Garfield	Oliphant

## 2. Affected Environment and Impacts Traffic and Transportation

**Table 2-42 Proposed Roads for Project Use**

County	Road Name
Garfield	Oliphant Ridge
Garfield	Owens
Garfield	Owsley Grade
Garfield	Peola
Garfield	Rickman Gulch
Garfield	Skyhock
Garfield	State Hwy 261
Garfield	State Hwy 127
Garfield	State Hwy 128
Garfield	Story
Garfield	Tatman Mountain
Garfield	U.S. Route 12
Garfield	Vannatton Grade
Garfield	Walhder
Garfield	Weimer Gulch
Garfield	Willow Gulch

**Table 2-43 Existing Plus Project Traffic Operations**

Roadway	Designation	Existing Plus Project ADT	Daily V/C Ratio (wo/w Project)
U.S. Route 12	Class I	2217	Existing = 0.10 With Project = 0.12
SR 127	Class II	847	N/A <sup>1</sup>
SR 261	Class II	817	N/A <sup>1</sup>

Note: Estimated capacity based on 2,400 vehicles per hour, per lane, as advised by WSDOT and a k-factor (peak hour percentage) of 15 percent (Decker 2009).

<sup>1</sup> Due to the fact that traffic volumes on SR 127 and SR 261 are approximately ¼ of the volume on U.S. 12, the V/C ratio would be negligible.

Temporary traffic impacts were assessed by adding the anticipated Project-related construction traffic described above to the existing traffic on selected highway segments as shown in Appendix F. Volume to capacity (V/C) ratios were then compared for without and with-Project conditions. Table 2-43 provides a summary of the results of this comparison. Changes in V/C ratios are very small and will fall below County significance thresholds. Potential short-term impacts associated with traffic levels and LOS values for potentially affected highways will be less than significant, and will not cause any section of road used in relation to the Project's construction to fall below its applicable LOS.



## **2. Affected Environment and Impacts Traffic and Transportation**

### **Air Navigation Considerations**

Construction equipment that might impact air navigation includes cranes used to assemble the towers. With appropriate FAA safety measures, this equipment will not pose a hazard to air navigation.

### **Parking during Construction**

During construction, parking may be located at the site in one of the six O&M facilities and along the site access roads. Where possible, multiple WRAs may be served by one O&M facility. A graveled permanent parking area for employees, visitors, equipment and emergency response vehicles will be located adjacent to a facility building.

The O&M facility site will also serve as a construction staging area. Personnel working on turbine foundations, electrical infrastructure, and turbine erection will park along turbine string roads. It is anticipated that roughly half of all construction worker vehicles would be parked at the O&M facility location, and the other half will be dispersed across the various turbine strings. With a peak workforce of 160 people, the maximum number of worker vehicles anticipated at any one time is 107, assuming that efforts to encourage carpooling will result in about one-third of construction workers carpooling to and from the Project site. The maximum area required for parking (assuming no carpooling) will be a maximum of 2 acres.

### **Damage to Roadways**

Trucks carrying heavy equipment to the Project site could damage existing streets. Truck loads may weigh as much as 280,000 pounds. Wide trucks could cause damage along the sides of roads without paved shoulders and could cause culverts to collapse. Damage could be exacerbated by erosion caused by precipitation, eventually causing safety impacts to vehicular traffic and bicyclists. This potential short-term impact will be significant, but mitigatable. Project vehicles could track dust, soils, and other materials from the Project site onto the public roads. An erosion control plan will be required, however, that will include measures to stabilize construction entrances and exits to prevent sediment from being tracked onto adjacent roadways and to ensure the prompt removal of any sediment or other materials that are tracked off site (see Section 2.3 Soils). The Garfield County Haul Road Agreement and Columbia County Franchise Agreement and bonding requirements will address any damage to roads from the Project.

### **Roadway Limitations**

Before beginning construction, the contractor retained to perform heavy-haul services will develop a haul and approach route in coordination with, and approved by, the appropriate jurisdictional authorities. The plan shall include an evaluation of the weight and load limitations, intersection turning requirements and overhead obstructions. All loads transported on WSDOT and County right-of-way will be within the legal size and load limit, or have a valid oversize and/or

## **2. Affected Environment and Impacts Traffic and Transportation**

weight permits. The Applicant is required to notify WSDOT regarding the length, turning radius, overheight dimensions, and the transport route of the turbines.

The Project could also impact traffic operations on transporter routes. Construction activities will be limited to periods of appropriate weather both because of access to the site and the ability to pour concrete and erect towers. Thus, construction activity will take place during the spring, summer, and fall seasons. Seasonal road closures (early winter/late spring) are common within the Project area. Seasonal traffic volumes are likely to be unaffected by construction because of the low traffic volumes in the area and lack of tourist-oriented facilities along the route.

### **Road Blockages/Traffic Delays**

Several oversized truck trips per day will occur during peak construction, which could cause temporary blockages of intersections on U.S. Route 12, SR 127, and 261. In such event, traffic would be routed around these intersections.

Construction trips also could cause temporary traffic delays on local roads. While such delays would pose an inconvenience, they would not result in safety impacts to the general public. Roadway maintenance and traffic flow will be addressed through Haul Road Agreements and requisite permits in both counties.

### **Transportation of Hazardous Materials**

Diesel fuel is the only potentially hazardous material that would be used in any significant quantity during construction of the Project. During construction, fuel tanker trucks would be used for the refueling of fuel storage tanks on-site. Any fuel tanker trucks necessary for the Project will be properly licensed and professionally driven and will incorporate appropriate design features such as overflow prevention devices and fixed couplings to prevent accidental spills. Operating procedures to prevent and contain any accidental spills resulting from fuel transportation and transfer are described in detail in Section 2.16 Health and Safety. Small amounts of other hazardous materials that would be transported to the site during construction include lubricating oils, cleaners, and herbicides. Transportation of these materials will be conducted in a manner that is protective of human health and the environment and in accordance with applicable federal, state and local requirements.

### **Roadway Hazards**

Prior to construction, a Haul Road Agreement in Garfield County, and CUP conditions and bonding requirements that address traffic management will be prepared in consultation with Garfield and Columbia counties and WSDOT. The Haul Road Agreement will identify all special permits and approvals required to utilize the jurisdictions' respective roads (including without limitation right-of-way use, right-of-way access, and franchise permits) and will include measures to minimize hazard and impacts of construction-related traffic.

## **2. Affected Environment and Impacts Traffic and Transportation**

It is anticipated that the addition of construction-generated traffic by the Project will have little effect on the existing accident rate or pattern. The largest potential change is along the road accessing the site. Along these segments of roadway the increase in truck traffic may result in more motorists attempting to pass slow-moving vehicles.

### **Project Facility Impacts**

#### All Four WRAs

#### **Traffic**

A Professional management staff of 4 to 5 people per phase will be onsite during business hours to support planning, accounting, and other operations functions. Additionally, one maintenance technician is required for every 6-8 turbines. Therefore, it will be reasonable to expect an aggregate local staff of 89 total for the Project involved in the day-to-day management, operation, and maintenance of the facility. The operations and maintenance crew will work 8-hour days Monday through Friday, with additional hours on weekend shifts as required. This equates to a maximum of 264 daily trips (see Table 2-44). It is anticipated that nearly all of the full-time operations workers will reside within the vicinity of the Project.

**Table 2-44 Project Operation Phase Trip Generation**

Staff	795 turbines/2.5 MW
Maintenance / Service Employee	60 (120 trips)
Management	26 vehicles (52 daily trips)
Light Duty Delivery Trucks	
Maintenance Trucks	46 vehicles (92 daily trips)
Heavy Duty Delivery Trucks	
Total truck trips	Except for unusual or extraordinary circumstances, heavy truck traffic is not anticipated during the operations phase of the Project
Total Operation Trips	
Daily trips	264

#### **Roadway Limitations**

The operation of the Project will have little impact on the condition of the public road system. Heavy truckloads related to replacement of turbines or nacelles, will occur over time with scheduled maintenance.

#### **Parking**

During the operational phase, parking will be at the O&M facility parking lot. With an anticipated operations workforce of 89 total people for the Project, plus

## ***2. Affected Environment and Impacts Traffic and Transportation***

occasional guests and visitors, delivery vehicles, etc., no more than 30 vehicles are expected to be parked at the facility at any one time. This will be a smaller area than that required for the construction phase. The permanent parking area at the O&M facility will be graveled to reduce dust and soil erosion.

### **Transportation of Hazardous Materials**

Hazardous materials to be transported to the Project during operation, specifically those needed for turbine maintenance activities, and include small amounts of lubricating and mineral oils, and cleaners. These will be in quantities below state and federal regulatory thresholds. Transportation of these materials will be conducted in a manner that is protective of human health and the environment and in accordance with applicable federal, state and local requirements.

### **Traffic Hazards**

Traffic generated by the operation of the Project is not anticipated to affect the accident rate or pattern on roadways that are part of the transporter routes. The Project will not alter public roadways except for the Project site access. The proposed site access provides adequate sight distance for vehicles entering the roadway.

### **Air Navigation Considerations**

Wind turbines must meet FAA safety lighting requirements, which may include lights that flash white during the day (at 20,000 candela) and red (at 2,000 candela) at night, provided that no white day lights are presently required by the FAA if the turbine towers are light colored and the red night lights are synchronized to blink uniformly. The exact number of turbines that would require lighting will be specified by the FAA after it has reviewed final Project plans. A Notice of Proposed Construction or Alteration Form (FAA Form 7460-1) will be completed.

Aerial applicators are able to fly within operating wind project areas, sometimes with less efficiency; however, there are no impacts anticipated to local aerial application of herbicides and pesticides. Ground application is an alternative to aerial application, and is often used when crops are small.

### ***End of Design Life Impacts***

End of design life alternatives, such as decommissioning and repowering, will result in similar increases in traffic and trip generation as during construction. Heavy vehicle trips will primarily consist of trucks carrying turbines and transformers and will be less than the number of trips required during construction. The resulting workforce and lightweight delivery vehicle trips will also be smaller. Mitigation will be determined at the time of decommissioning, if that option is chosen, and will likely be similar to that recommended for construction.

### **Mitigation**

The Applicant has proposed the implementation of the following measures as part of the Project.

- Prior to construction, required road agreements will be prepared in consultation with local and state agencies. Additionally, any bonding requirements will be met prior to construction. The road agreement will identify all special permits and address issues as needed, such as equipment delivery scheduling, routing plans, informational signs, flaggers, temporary lane configuration, and notice to adjacent property owners if temporary access disruption is expected.
- Public roadways will be restored to their condition existing prior to construction activities.
- Pilot cars will be used as WSDOT dictates, depending on load size and weight.
- Where construction may occur near the roadway, the Applicant shall attempt to maintain one travel lane at all times.
- The Applicant will provide for advance notification to emergency providers, and hospitals when public roads may be partially or completely closed.
- The Applicant will develop protocols for passage of emergency vehicles
- The Applicant will coordinate traffic control requests through the WSDOT South Central Region's Traffic Engineer.
- The Applicant will comply with seasonal road restrictions as instituted by Garfield and Columbia counties.
- The Applicant will follow FAA guidelines for a wind turbine lighting and warning system.

#### **2.13.2.2 No Action Alternative**

Under the No Action Alternative, the Project will not be constructed or operated. Based on the continued use of the site without change, there will be no change in the traffic volume in the Project area.

#### **2.13.2.3 Probable Significant and Unavoidable Adverse Impacts**

During construction, the Project will require transport of a significant amount of oversized materials to the site, requiring special permits from WSDOT, that is likely to create temporary disruption to local roads. However, with the proposed haul route and WSDOT permit mitigation, the impacts will be temporary and not deemed significant.

#### **2.13.2.4 Cumulative Impacts**

The cumulative impacts analysis area is defined as the system of roads and highways within or adjacent to the Project area, which could be affected by the concurrent development of other potential projects as discussed in Table 2-1. In addition, Table 2-45 below lists local road improvement projects that may be

## **2. Affected Environment and Impacts Traffic and Transportation**

constructed during Project construction. (Note: The source of the data in Table 2-45 is the respective counties' six-year Transportation Improvement Plans and may change with the periodic adoption of new programs.) During construction, the delivery of construction materials and the interruption of traffic for construction of either the projects listed in Table 2-1 or the road projects listed in Table 2-45 could contribute to adverse traffic effects should they be under construction at the same time and in proximity to the proposed Project. Implementation of a Haul Road Agreement and bonding requirements would ensure that cumulative traffic impacts would be mitigated. The increase in traffic and the heavier loads over the construction period of the potential projects in Tables 2-1 and 2-45, and would produce a slight cumulative impact, primarily in terms of road wear and tear, and inconvenience to road users and local residents along U.S. Route 12, SR 261, and SR 127. An increase in road maintenance could be expected during and after construction depending on the amount of wear and tear that results.

The volume of traffic for the Project and those other potential projects considered in this analysis is unlikely to result in cumulatively significant impacts because of the size of the region, number of alternative transportation routes available in the existing road system, and temporal spacing of projects. Transportation and traffic impacts related to construction of the proposed Project would not be cumulatively significant.

**Table 2-45 Future Regional Transportation Projects**

Project Name	Description /Estimated Project Disturbance	Location	Distance to Project Area	Status
Peola Road	Mile post 1.57 to 7.84 – Road widening, vertical and horizontal alignment correction, surfacing, striping, etc. <ul style="list-style-type: none"> <li>Assumption: Upgrades will occur within the existing ROW; widening will occur within existing ROW and shoulder areas, resulting in minimal new areas of impact</li> </ul>	Garfield County, WA	Potentially within Dutch Flats WRA	Project near construction stage; construction anticipated to start in April 2009.
Pataha Creek Bridge (Columbia Center)	Mile post 9.4 to 9.65 – Replace existing narrow structure, reconstruct approaches, vertical alignment. <ul style="list-style-type: none"> <li>Assumption: Upgrades will occur within the existing road ROW</li> </ul>	Garfield County, WA	Approximately 2.5 miles south of Dutch Flats WRA	Construction to start June 2010.
Kirby–Mayview Road	Mile post 0.00 to 4.65 – Realign, reconstruct, grade, etc. <ul style="list-style-type: none"> <li>Assumption: Upgrades will occur within the existing road ROW</li> </ul>	Garfield County, WA	Approximately 10 miles east of Kuhl Ridge	Project design and construction to start in 2012.
Fairgrounds Road/U.S. 12 Intersection Reconfiguration	Mile Post 0.00 to 0.2 – Relocate/reconstruct Fairground Road Intersection with U.S. Route 12. Construction of turn lanes on U.S. 12 and replacement of existing bridge over Pataha Creek. <ul style="list-style-type: none"> <li>Assumption: Upgrades will occur within the existing road ROW</li> </ul>	Garfield County, WA	Approximately 0.2 miles north of Dutch Flats WRA	Project design and construction to start in 2013.
Lower Deadman Road	Mile Post 10.13 to 11.91 – Upgrade to all-weather, striping, etc. <ul style="list-style-type: none"> <li>Assumption: Upgrades will occur within the existing road ROW</li> </ul>	Garfield County, WA	< 1 mile north of Kuhl Ridge WRA	Pending funding.
North Deadman Road	Mile Post 0.00 to 5.18 – Upgrade to all-weather, striping, etc. <ul style="list-style-type: none"> <li>Assumption: Upgrades will occur within the existing road ROW</li> </ul>	Garfield County, WA	Approximately 6 miles east-northeast of Kuhl Ridge WRA	Pending funding.
Gould City Road	Mile Post 9.55 to 11.24 – Upgrade to all-weather, striping, etc. <ul style="list-style-type: none"> <li>Assumption: Upgrades will occur within the existing road ROW</li> </ul>	Garfield County, WA	Approximately 2 miles east of Kuhl Ridge WRA at closest point	Pending funding.
County-wide Bridge Repair	Repair of 10 structures. <ul style="list-style-type: none"> <li>Assumption: Project will occur within the existing road ROW</li> </ul>	Garfield County, WA	N/A	Pending funding.
Miscellaneous Construction/Spot Improvement	Small road and bridge projects. <ul style="list-style-type: none"> <li>Assumption: Projects will occur within the existing road ROW</li> </ul>	Garfield County, WA	N/A	Construction in 2009.
Kellogg Hollow Road, Phase I	Mile Post 0.00 to 3.2 – Widening, drainage, surface, etc. <ul style="list-style-type: none"> <li>Assumption: Widening will occur within existing ROW and shoulder areas yielding minimal new areas of impact</li> </ul>	Columbia County, WA	Within the Tucannon WRA; far western portion of the WRA	Construction to start in February 2010.
Tucannon Hollow Road, Phase 3	Mile Post 12.95 to 15.55 – Correct curves, widen, pave <ul style="list-style-type: none"> <li>Assumption: Widening will occur within existing ROW and shoulder areas yielding minimal new areas of impact</li> </ul>	Columbia County, WA	Forms the southern boundary of Oliphant WRA in places	Construction to start in February 2010.

## **2.14 Land Use and Recreation**

### **2.14.1 Affected Environment**

#### **2.14.1.1 Project Area Existing Land Use and Zoning**

The Project will be located in southeastern Washington, in the Columbia Plateau region, on ridge tops between the towns of Starbuck, Pomeroy and Dayton. The area is characterized by a rolling rural landscape, dominated by agricultural areas and grasslands comprised of crested wheat grass, bluebunch wheatgrass, bluegrass and other species, and some livestock grazing. Several residential homes and farm buildings exist within the Project area. Because the Project spans both Columbia and Garfield counties, a specific discussion of land use is provided below at the county level. Tucannon and Oliphant Ridge WRAs are located in Columbia County and are discussed first, followed by Kuhl Ridge, Dutch Flats, and Oliphant Ridge WRAs in Garfield County.

Existing residences and businesses within the Project area have been identified using the 911 databases for both Columbia and Garfield counties. These databases, however, may not represent a comprehensive listing of all improved properties within the county.

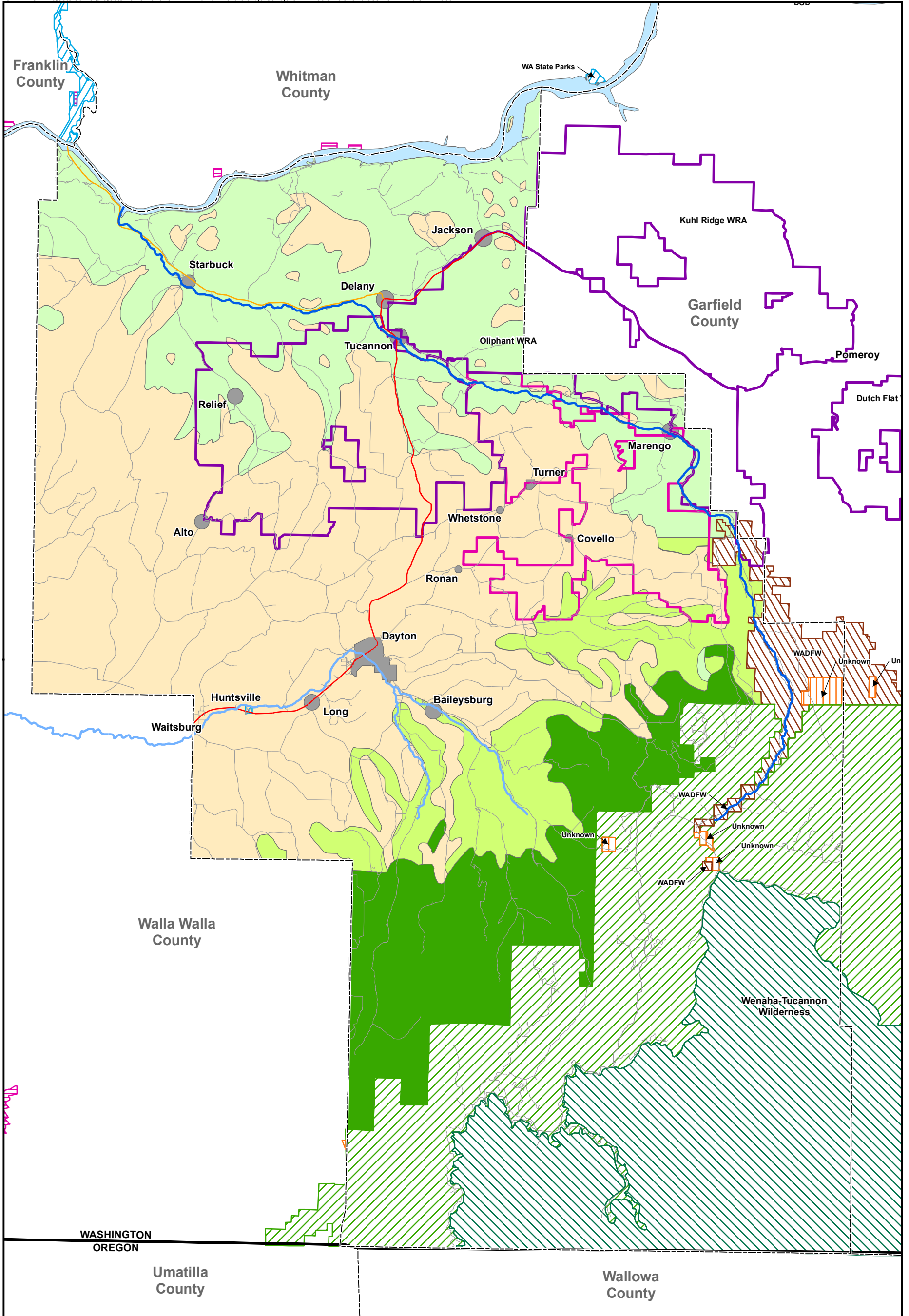
#### Tucannon and Oliphant Ridge WRAs (Columbia County)

The Tucannon and Oliphant Ridge WRAs encompass approximately 57,850 acres of private lands in Columbia County. The WRAs consist of land that is generally five miles north of the city limits of Dayton and bordered on the north and west by U.S. Route 12 and bordered on the south by Tucannon Road. Land use within the WRAs consists mainly of cropland (including winter wheat and row crops) and grass range (see Figure 2-17). Most of the agricultural land within the Project area consists of perennial pasture, some of it used for livestock grazing, and hay crops, though small grains and row crops are also cultivated (Columbia County 2007). Low-density residential development associated with farms or clustered in small “crossroads” communities is scattered along primary roadways in the rural areas of the county. In addition to agricultural and residential areas mentioned above, other land uses in these WRAs include:

- Multiple commercial gravel pits,
- State and county transportation corridors (roads);
- Outdoor recreational sports and activities
- Livestock propagation;
- Beekeeping;
- Recreational hunting and fishing; and
- Transmission lines.

The Tucannon WRA and Oliphant Ridge WRA within Columbia County are located within the Agricultural (A-1) Zone (see Figure 2-18). The purpose of the A-1 Zone is to protect areas intended for agricultural activities and accessory uses from encroachment by nonagricultural land uses and to preserve areas containing prime farmland soils for agricultural activities. The minimum lot size in the A-1





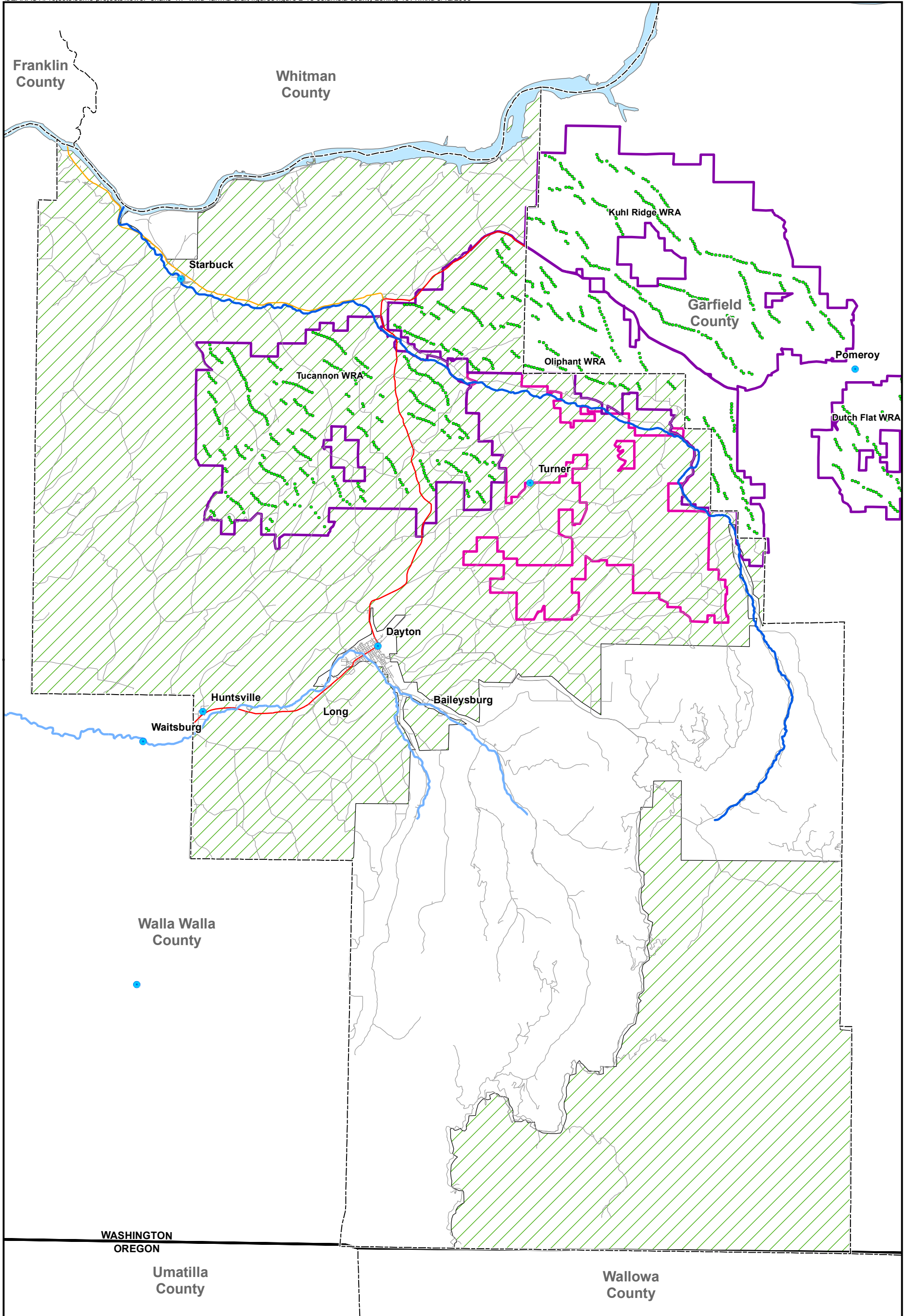
**Lower Snake River Wind Energy Project**  
Columbia & Garfield Counties  
Washington

Legend	
--- County Lines	Land Ownership
— US and State Highways	Dept of Defense
— State and County Highways	USFS
— Local Rural Road	USFS Wilderness
	Unknown
	WA State Parks
	WADFW
	Land Use
	Cropland
	Grass Range
	Grass, Brush, Tree Range
	Grass, Tree Range
	Urban Area

**Figure 2-17**  
**Columbia County Land Use**

Scale 1:220,000

0 1 2 4 6 8  
Miles



**Legend**

- Turbine Location
- City
- - - County Lines
- US and State Highways
- State and County Highways
- Local Rural Road

**Zoning**

- ▨ A-1 Agriculture

Lower Snake River Wind Energy Project  
Columbia & Garfield Counties  
Washington

**Figure 2-18**  
**Columbia County Zoning**

0 1 2 4 6 8  
Scale 1:220,000 Miles

## **2. Affected Environment and Impacts Land Use and Recreation**

Zone is 40 acres. Columbia County has expressly designated the A-1 Zone to allow of commercial scale wind power facilities as a conditional use. In addition to the Columbia County Zoning Ordinance, the conditions of development of commercial wind energy facilities are guided by the Columbia County Commercial Wind Turbine Energy Projects Standards of Development.

### Kuhl Ridge, Dutch Flats, and Oliphant Ridge WRAs (Garfield County)

The Kuhl Ridge, Dutch Flats, and Oliphant Ridge WRAs encompass approximately 66,350 acres in Garfield County. The WRAs are comprised of lands south of Pomeroy, north of the Pataha River, and between the Pataha and the Tucannon Rivers. Land within the WRAs is primarily in private ownership. Most of the land within the WRAs is in agricultural production; the dominant crops grown in the county include winter wheat and barley (see Figure 2-19; Garfield County 2008a). Canola, hay, and grass seed are also grown (Garfield County 2008a). Livestock grazing also occurs within the WRAs. Low-density residential development, mostly consisting of single-family houses associated with farms, is scattered throughout the WRAs. In addition to agricultural and residential areas mentioned above, the following other land uses are located within the Kuhl Ridge, Dutch Flats, and the Garfield County portion of the Oliphant WRA:

- Multiple commercial gravel pits,
- Commercial quarries, and borrow pits
- Outdoor recreational sports and activities;
- State and county transportation corridors (roads);
- Recreational and commercial hunting and fishing; and
- Transmission lines.

The Garfield County WRAs are located entirely within Garfield County's Agricultural Zone. The zoning ordinance (Section 1.03.010) defines the Agricultural Zone as:

Intended to protect and preserve the character of existing ag lands with a minimal amount of development; only allowing land uses which are compatible with the established pattern including the development of low-density residential and commercial uses which support agriculture. It is not intended to allow other land uses of a commercial or industrial nature which have the potential to erode the agricultural character of the zone. Garfield County may allow "renewable energy facilities" as a conditional use in the agricultural zone.

Renewable energy facilities are permitted as a conditional use in the Agricultural Zone.

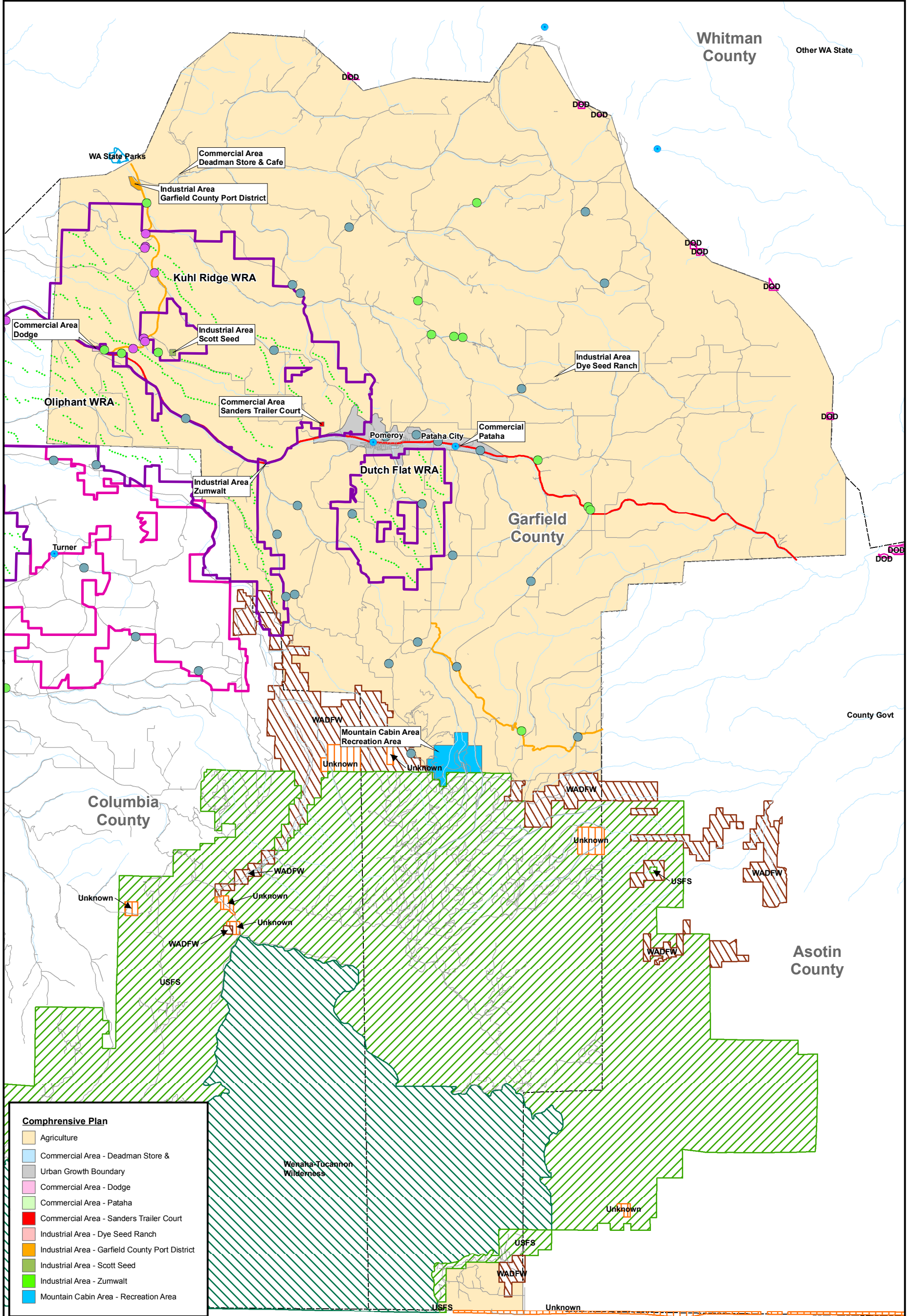
## **2. Affected Environment and Impacts Land Use and Recreation**

The zoning ordinance includes requirements and standards, including setbacks, with which alternative energy facilities sited within Garfield County must comply. These requirements and standards are summarized in Section 2.14.2.

### **2.14.1.2 Recreation**

Numerous recreational sites exist in and around Columbia and Garfield counties and include parks, pools, fairgrounds, playgrounds, camping sites, and other recreation sites on private lands, municipal, county, state, and federal lands, including the Umatilla National Forest and Wilderness Area. A list of local, state, and national recreational areas within a 25 mile radius of the Project site, including trails, campsites, boating areas, and ski slopes, is provided below:

- Three Forks Trailhead
- Pomeroy Fairgrounds
- Pomeroy Golf Course
- Pomeroy City Park
- Gun Club
- Central Ferry State Park/Central Ferry Boat Launch
- Patit Creek Campsite
- Touchet Valley Golf Course
- Columbia County Fairgrounds
- Flour Mill Park
- Dayton City Park and Pool
- Fish Hook Park
- Umatilla National Forest
- Dayton Fishing Ponds
- Touchet River Bike/Hike Path
- Willow Landing
- Little Goose Landing
- Lewis and Clark Trail State Park
- Texas Rapids Launch
- Riparia
- William T. Wooten Game Range
- Tucannon Camp Ground
- Lyons Ferry State Park and Marina
- Camp Wooten State Park
- Kendall Monument
- Illia Dunes
- Wenaha-Tucannon Wilderness Area
- Illia Dunes Landing
- Boyer Park and Marina
- Head Gate County Park
- Field Spring State Park



**Lower Snake River Wind Energy Project**  
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<p><b>Comprehensive Plan</b></p> <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #f4b084; border: 1px solid black; margin-right: 5px;"></span> Agriculture</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #add8e6; border: 1px solid black; margin-right: 5px;"></span> Commercial Area - Deadman Store &amp;</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #cccccc; border: 1px solid black; margin-right: 5px;"></span> Urban Growth Boundary</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #f080f0; border: 1px solid black; margin-right: 5px;"></span> Commercial Area - Dodge</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #90ee90; border: 1px solid black; margin-right: 5px;"></span> Commercial Area - Pataha</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #ff0000; border: 1px solid black; margin-right: 5px;"></span> Commercial Area - Sanders Trailer Court</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #ff6347; border: 1px solid black; margin-right: 5px;"></span> Industrial Area - Dye Seed Ranch</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #ffa500; border: 1px solid black; margin-right: 5px;"></span> Industrial Area - Garfield County Port District</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #808000; border: 1px solid black; margin-right: 5px;"></span> Industrial Area - Scott Seed</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #00ff00; border: 1px solid black; margin-right: 5px;"></span> Industrial Area - Zumwalt</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #00b0f0; border: 1px solid black; margin-right: 5px;"></span> Mountain Cabin Area - Recreation Area</li> </ul>	<p><b>Legend</b></p> <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 10px; height: 10px; border: 1px dashed black; margin-right: 5px;"></span> Turbine Location</li> <li><span style="display: inline-block; width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></span> County Lines</li> <li><span style="display: inline-block; width: 10px; height: 10px; border: 1px solid green; margin-right: 5px;"></span> Borrow Pit</li> <li><span style="display: inline-block; width: 10px; height: 10px; border: 1px solid red; margin-right: 5px;"></span> US and State Highways</li> <li><span style="display: inline-block; width: 10px; height: 10px; border: 1px solid blue; margin-right: 5px;"></span> Gravel Pit</li> <li><span style="display: inline-block; width: 10px; height: 10px; border: 1px solid orange; margin-right: 5px;"></span> State and County Highways</li> <li><span style="display: inline-block; width: 10px; height: 10px; border: 1px solid purple; margin-right: 5px;"></span> Quarry</li> <li><span style="display: inline-block; width: 10px; height: 10px; border: 1px solid grey; margin-right: 5px;"></span> Local Rural Road</li> <li><span style="display: inline-block; width: 10px; height: 10px; border: 2px solid purple; margin-right: 5px;"></span> Project Area</li> </ul>
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**Figure 2-19**  
**Garfield County Land Use and Zoning**

## **2. Affected Environment and Impacts Land Use and Recreation**

- Rooks Park
- Lions Park
- Hells Gate State Park
- Green Park Campground
- Vernon Park
- Beachview Park
- Chief Looking Glass Park
- Wildwood Park
- Pioneer Park
- Washington Park

The Three Forks Trail is located approximately 500 feet north of the Oliphant Ridge WRA off of U.S. Route 12 in Columbia County (see Figure 2-20). No other parks or recreational areas are located within 500 feet of the Project areas in Columbia County.

The Umatilla National Forest is a major recreational destination covering 1.4 million acres in the Blue Mountains of southeast Washington and northeast Oregon. The northern boundary of the national forest is located about 5 miles south of the Oliphant WRA; no forestlands are located within any of the WRAs. The national forest includes four ranger districts with 34 campgrounds and 11 cabins. Recreational activities offered in the national forest include all-terrain vehicle (ATV) riding, fishing and hunting, wildlife viewing, hiking, and horseback riding. River rafting is offered on the North Fork John Day River and the Wallowa and Grande Ronde rivers between Heller Bar (Asotin County), Washington, and Minam, Oregon. Winter activities in the national forest include snowmobiling, dog sledding, downhill skiing and sledding, cross country skiing, ice fishing, and ice skating. Two ski areas are located within the national forest: Ski Bluewood, located 21 miles southeast of Dayton, and Spout Springs Resort, located in Oregon.

The Wenaha-Tucannon Wilderness encompasses 177,465 acres in the Umatilla National Forest in southeastern Washington and northeastern Oregon. Elk hunting is the primary recreational activity within the wilderness, and fishing areas are also available along the Tucannon and Wenaha Rivers. Over 200 miles of trails are also available for equestrians and hikers. Developed campsites are located near major trailheads along the perimeter of the wilderness (U.S. Forest Service 2009b).

Lyons Ferry Park and Marina are located on the Snake River near the town of Starbuck. Lyons Ferry Marina is located in Columbia County, while Lyons Ferry Park lies across the river in Franklin County. The park and marina are accessed off State Route 261. The Port of Columbia manages and operates the park and marina under a lease agreement with the U.S. Army Corps of Engineers. Camping and recreational vehicle (RV) sites are available at both the park and marina.

## **2. Affected Environment and Impacts Land Use and Recreation**

Recreational offerings include boating and kayaking, fishing, swimming, and picnicking (Port of Columbia 2009).

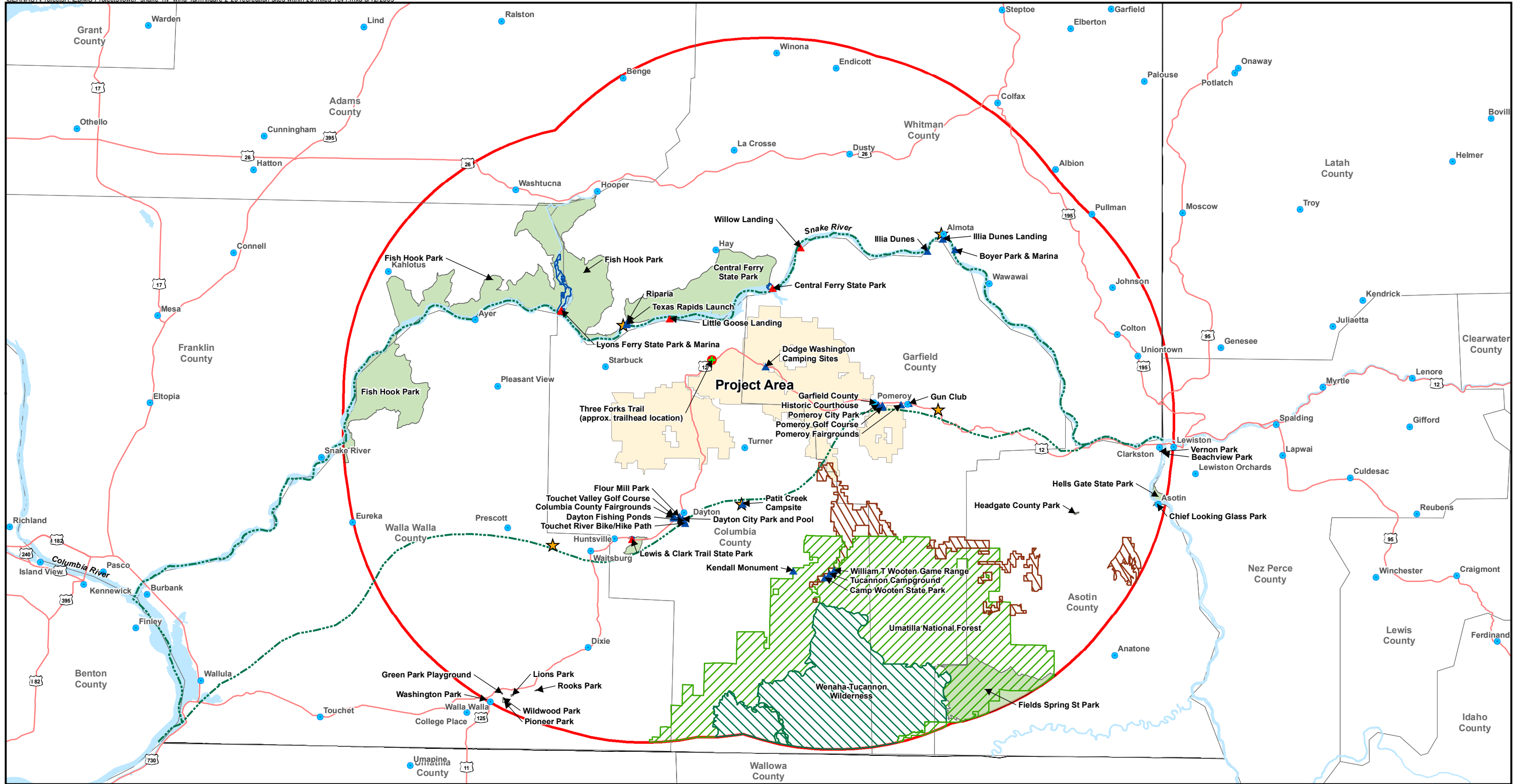
Lewis and Clark Trail State Park is located west of Dayton off U.S. Route 12 in Columbia County. The park encompasses 37 acres and includes over 1,300 feet of shoreline on the Touchet River. Twenty-four standard campsites able to accommodate RVs are located in the park, as well as 17 primitive campsites. Recreational offerings at the park include hiking on two miles of trails; fishing; swimming; badminton, baseball, and volleyball; bird and wildlife watching; and cross country skiing and snowshoeing (Washington State Parks 2009).

A variety of recreational activities are available in and around the cities of Dayton and Pomeroy. Recreational facilities located in Dayton include a nine-hole golf course, fairgrounds with a horse track, an Olympic-sized swimming pool, a city park with a covered pavilion, tennis courts, a sand volleyball court, and youth fishing ponds (Columbia County 2007). Pomeroy's recreational facilities include a city park, tennis courts, a nine-hole golf course, a track and football field complex, a city pool, playgrounds, ball fields, gymnasiums, and an equestrian arena (Garfield County 2008a; Columbia County 2007). In addition, the Pomeroy Gun Club is located in the neighboring community of Pataha (Pomeroy Chamber of Commerce 2009).

### ***Hunting***

Four landowners within the Project area are part of WDFW's private lands access programs. Three landowners are part of the "Feel Free to Hunt" program in which the public is allowed access to these private lands for hunting purposes. A total of approximately 6,932 acres within the Project area are a part of this program (WDFW 2009). Hunting is permitted for pheasant and deer on these lands. In addition, there is a 150-acre parcel of land which is part of the "Hunt with Written Permission" program (WDFW 2009). On this property, hunting is permitted for pheasant only. The remainder of the landowners in the Project area privately manage access and hunting on their own lands, and no public access is available.

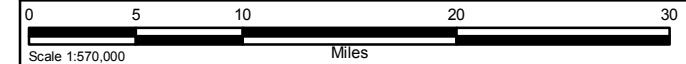
At other regional wind energy projects, for example, the Hopkins Ridge and Wild Horse wind energy projects, special rules have been established for hunting activities within the boundary of the wind energy facilities. These rules have been created and implemented to ensure the safety of hunters, local residents, and wind facility workers. These rules apply to those parcels which are a part of WDFW's private lands access programs, and include such stipulations as no vehicle traffic on wind turbine access roads and no access within 300 feet of wind turbines or substations. See Mitigation for a complete listing of these rules. At the Hopkins Ridge Wind Facility, a map of the facility was created, and areas of public access for hunting are clearly delineated on the map, as well as what permissions are necessary for access. Areas where hunting is not permissible are also clearly designated on the map.



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**Figure 2-20**  
**Recreation Sites within 25-mile Radius**  
**of the Project Area**

- |  |  |                       |
|--|--|-----------------------|
| <b>Legend</b>                              |  | <b>Land Ownership</b> |
| ● Receptor                                 | --- Lewis & Clark Trail                | USFS                  |
| ● City                                     | --- Regional Major Roads               | USFS Wilderness       |
| ● Three Forks Trailhead (approx. location) | --- Project Area to Recreation (miles) | WA State Parks        |
| ▲ Area Receptor                            | ■ Project Area                         | WADFW                 |
| ▲ Lewis & Clark Area Receptor              | ■ Recreation Sites                     |                       |
| ★ Lewis & Clark Campsites                  | ■ Project Area Buffer (25 miles)       |                       |



Source Information:



**2.14.2 Impacts and Mitigation**

The Project will utilize agricultural land for energy uses. With respect to recreation, the Project will result in temporary limitations on recreational users during construction, and minor limitations during operations.

**2.14.2.1 Preferred Alternative*****Construction Impacts***All Four WRAs

Project construction will occur on a temporary and intermittent basis within each phase as it is developed.

**Land Use**

During the construction period, temporary land use disturbance will occur in the Project area on approximately 2,750 acres in the immediate vicinity of construction sites, staging areas, and temporary access road corridors. Temporary land use disturbances will result from construction of Project facilities, including turbines, roads, substations, O&M facilities, permanent meteorological towers, roads, and poles associated with the overhead collection system. Direct land use impacts in each WRA will be temporary and will coincide with the construction period. Upon completion of construction, all temporarily disturbed areas will be restored to their original condition.

The primary land use within the Project area, agriculture, will continue during construction. However, agricultural production in portions of the Project area will be temporarily interrupted on an intermittent basis during the construction period, due to installation of new roads and other Project features.

**Recreation**

Project construction activities will occur on a temporary and intermittent basis. Construction is not likely to have significant adverse impacts on existing recreation resources or their users in the Project area. DNR has authorized temporary restrictions on access to their lands during construction. Private landowner-approved activities such as hunting will be temporarily curtailed during construction due to the need to avoid certain areas under active construction. Several recreational areas are within or overlap Project boundaries, such as the Pomeroy City Park, Pomeroy Golf Course, and Pomeroy Fairgrounds (Dutch Flats WRA). Many of the routes that recreational users may take to access various parks and other sites will be those used for construction traffic (U.S. Route 12, State Route 261 and others). However, these areas will not be closed during Project construction. Temporary access delays may result due to construction traffic or machinery utilizing regional roadways with multiple users traveling on these roadways. Traffic controls will be implemented to minimize

## 2. Affected Environment and Impacts Land Use and Recreation

these occurrences (see Section 2.13 Traffic and Transportation for a list of mitigative measures to be employed).

In addition, some parks and campsites may experience increased use by temporary construction workers during weekends.

### **Project Facility Impacts**

#### **Project Area Land Use**

The completed Project facilities will result in the permanent conversion of approximately 600 acres of agricultural land (see Table 2-46), to an energy production use. (Note: Permanent is defined as the life of the Project, or for at least 20 years.) The acreage, consisting of the footprint of the Project, will no longer be available for agricultural use during the life of the Project. However, there are other lands in the counties that could be put back into agricultural production that currently are not.

**Table 2-46 Permanently Disturbed Agricultural Areas**

	Tucannon WRA % of county farmland	Kuhl Ridge WRA % of county farmland	Dutch Flats WRA % of county farmland	Oliphant WRA % of county farmland
Permanently Disturbed Agricultural Areas	0.12%	0.06%	0.04%	0.06% Garfield 0.01% Columbia

Note:

Agricultural impacts were determined using the UGSG 2001 land cover dataset.  
Percentages are based on turbines and associated roads, plus other Project facilities

Agricultural land conversion is discussed at the county level below.

#### Tucannon and Oliphant Ridge WRAs (Columbia County)

According to 2005 data, 193,200 acres of land were devoted to agricultural uses, inclusive of both cropland and rangeland (Columbia County Land Use Plan 2007). Total permanently converted agricultural lands will represent approximately 0.14 percent (about 263 acres) of the overall portion of agricultural lands in Columbia County. This ratio will not adversely affect the productivity of agricultural operations in Columbia County. (See Section 2.15 Socioeconomics for a detailed discussion of the financial implications of this land conversion.)

#### Kuhl Ridge, Dutch Flats, and Oliphant Ridge WRAs (Garfield County)

According to the 1997 Census of Agriculture and other data, 327,200 acres of land in the county were agricultural, inclusive of both cropland and rangeland (Garfield County Comprehensive Plan 2008a). Total permanently converted

## **2. Affected Environment and Impacts Land Use and Recreation**

agricultural lands on the Project will represent approximately 0.16 percent (about 536 acres) of the overall portion of agricultural lands in Garfield County. This ratio will not adversely affect the productivity of agricultural operations in Garfield County. (See Section 2.15 Socioeconomics for a detailed discussion of the financial implications of this land conversion.)

Installation of turbines and the development of roads through farmland create fragmentation, which could lead to less efficient harvesting and the creation of more field edges which can facilitate the introduction of weeds. However, coordination with landowners regarding the co-location of facilities on farmland can lead to better placement and beneficial impacts. For example, new Project roads can be used by local farmers during planting and harvest, and for spraying fields. These new roads can improve access and efficiency by cutting out portions of existing roads that may be too steep or not structurally sound. In addition, the new roads will accommodate larger farm vehicles which may not be accommodated by the existing road network and these new roads also provide emergency vehicle access in the event of field fires. Landowners are reimbursed for impacts related to facility construction through the terms of their private leases.

### **Military Training Routes (MTRs)**

Several Navy scheduled low altitude Military Training Routes (MTR) used by squadrons stationed at Navy Region Northwest installations, such as Naval Air Station Whidbey Island in Island County, Washington, are located in the northwest corner of Garfield County. According to the Navy Region Northwest Community Plans and Liaison Officer, construction of wind turbines in the Oliphant Ridge and Dutch Flats WRAs will not conflict with Navy MTR flight training operations. Construction of wind turbines in the Kuhl Ridge WRA also will not conflict with these training operations (Melaas Pers. Comm. 2009).

### **Recreation**

Hunting on private lands leased for the Project will continue to be at the discretion of the individual landowners. Public access to private property will continue to be restricted as per the lease agreements between the Applicant and the property owners. Safety-related rules will be developed for use of the Project area during operation. Successful hunting with permission programs have been implemented at other wind farms owned and operated by the Applicant. Private landowners must agree to participate in these programs. Refer to Mitigation for a detailed discussion of the Applicant's hunting by permission program.

If existing hunting programs were restricted throughout the life of the Project, there could be potential impacts to recreational opportunities and impacts to crops due to increased populations of elk and deer.

**Consistency with Local Land Use Controls**

This section provides a summary of the consistency of the Project with adopted land use plans, policies, and regulations.

***State of Washington Requirements*****Growth Management Act**

Washington's Growth Management Act (GMA) at Chapter 36.70A RCW requires urban and/or rapidly growing counties and cities to manage urban growth and coordinate land use and infrastructure planning. The GMA requires county and city governments to manage Washington's growth by preparing comprehensive plans and implementing them through adoption of zoning controls and development regulations, designating urban growth areas, and identifying and protecting critical areas and natural resource lands. Neither Garfield nor Columbia County are "urban" or "rapidly growing" counties under the GMA. However, both Garfield County and Columbia County voluntarily comply with the GMA's planning regulations. The GMA defines 13 planning goals to guide the development of local comprehensive plans and development regulations (RCW 36.70A.020). Some of the relevant planning goals of the GMA are to:

- Reduce inappropriate conversion of rural land into sprawling, low-density development;
- Encourage economic development that is consistent with adopted comprehensive plans;
- Maintain and enhance natural resource-based industries; and
- Protect the environment and enhance air and water quality.

The requirements of the GMA are locally implemented through comprehensive plans and zoning ordinances. Therefore, to the extent that the Project is consistent with the Columbia County and Garfield County comprehensive plans and zoning ordinances, it is also consistent with the requirements of the GMA. In addition to planning and zoning, every jurisdiction must adopt a Critical Areas Ordinance.

In both the Columbia and Garfield County areas of the Project, the lands on which the Project will be sited are designated in their respective adopted and approved comprehensive plans as Rural, on which the natural resource-based wind industry can develop. The Project will be built on land zoned Agriculture-1 and Agriculture, respectively, for which wind energy facilities are uses conditionally permitted and deemed consistent with adjacent land uses and consistent with adopted comprehensive plans, thereby ensuring consistency with the GMA.

**Shorelines Management Act**

Washington's Shorelines Management Act (SMA) at Chapter 90.58 RCW regulates development within 200 feet of the ordinary high water mark of marine shorelines, streams with a mean annual flow in excess of 20 cfs, and lakes of 20 acres or more in size (as well as to the edge of wetlands associated with such

## **2. Affected Environment and Impacts Land Use and Recreation**

water features). Ecology (Chapter 173-22 WAC) regulates shorelines of the state through local agencies. Each county or city in the state, including Garfield and Columbia counties, has developed a Shoreline Master Program (SMP) specifying restrictions that may apply to certain water bodies and establishing steps necessary to obtain approval for alteration or development of such water bodies.

### Tucannon and Oliphant Ridge WRAs (Columbia County)

#### **Columbia County Comprehensive Plan**

Pursuant to the GMA, land use and planning for growth and development within Columbia County are guided by the Columbia County Comprehensive Plan (Columbia County 2007; CCCP). The CCCP addresses eight elements: land use, capital facilities, transportation, housing, utilities, economic development, rural, and parks and recreation.

Consistent with the CCCP, Columbia County has identified, by land use area designations, the general location and types of land uses suitable in the various areas of the county. The Tucannon and Oliphant WRAs within Columbia County are in the Rural area. This designation generally includes a range of land uses and residential densities that are compatible with the rural character of Columbia County. As such, the most common uses in the Rural area are those focused on agriculture and natural-resource based industry.

The CCCP's goals, policies, and objectives for Rural land are established to "guide public decision on the use of the county's rural lands" as these lands "are significant for their agrarian values." The goals, objectives, and policies defined in the Columbia County Comprehensive Plan that are applicable to the proposed Project are listed in Table 2-47. The consistency of the Project is discussed for each goal, objective, and policy.

As shown in Table 2-47, development of the Project in Columbia County will be consistent with the stated goals and objectives in the CCCP to convert to cost-effective and environmentally-sensitive technologies and energy sources and to encourage wind energy development.

## 2. Affected Environment and Impacts Land Use and Recreation

**Table 2-47 Columbia County Comprehensive Plan and Project Consistency**

Plan Element	Relationship to Project
<b>Land Use Element</b>	
<p><b>Goal:</b> The County will ensure that the character and location of land uses optimizes the combined potentials for economic benefit and the enjoyment and protection of natural and cultural resources while minimizing the threat to health, safety, and welfare posed by hazards, nuisances, incompatible land uses and environmental degradation.</p>	<p>The Project will be developed at a very low density across large tracts of land, and will result in minimal permanent disturbance to the land. Traditional farming activities continue contemporaneously; the land is not taken out of agricultural production, with the exception of areas where permanent facilities are sited. The presence of the turbines on agricultural land generates various sources of additional income to the landowners. The Project will adhere to various setbacks designed to safeguard health and safety.</p>
<p><b>Objective C:</b> Land not to be developed should include critical areas, as per the county's critical area ordinances, and performance zoning to protect scenic areas.</p>	<p>The Project will adhere to the various provisions of the Columbia County CAO, including buffer designations for critical areas. See Sections 2.3 Geology, 2.4 Soils, 2.5 Water Resources, 2.6 Wetlands, Section 2.7 Aquatic Resources, Fish and Wildlife, 2.8 Bird and Bat Resources, and 2.9 Vegetation, for further details.</p>
<p><b>Resource Protection, Objective H:</b> To provide for an effective stewardship of the environment, protect critical areas, conserve agricultural, forest, and mineral lands for resource production, and conserve air, water, cultural, and energy resources.</p>	<p>The final Project design will rely on micro-siting to avoid impacts to critical areas, such as wetlands and primary habitats, and cultural resources. The Project would be sited in lands zoned agricultural (A-1). Traditional agricultural activities can continue simultaneously with Project operation.</p>
<b>Utilities Element</b>	
<p><b>Objective B: Energy Conservation and Generation, Policy 3:</b> Energy development that utilizes wind, hydro, solar, gas, and biofuels shall be encouraged. These technologies should be sensitively sited, designed and mitigated to minimize significant adverse environmental impacts.</p>	<p>The Project utilizes wind energy and has been designed so that Project facilities minimize impacts to sensitive features. The construction and operation of the Project will adhere to the mitigation measures discussed under each resource heading in this EIS.</p>
<b>Economic Development Element</b>	
<p><b>Goal E:</b> To encourage and strengthen stability in Columbia County's economic base through diversification and increased employment.</p>	<p>The Project will generate local jobs and will contribute to the local tax base. See Section 2.16 Socioeconomics for further details of the economic benefits of the Project.</p>
<p><b>Policy 5:</b> Encourage the development of environmentally-sensitive businesses and industries in the county.</p>	<p>The Project represents an environmentally-sensitive industry which will create local jobs in the County.</p>
<p><b>Objective B: Business Development, Policy 1:</b> The county should encourage development of wind generation projects.</p>	<p>The Project will help the County achieve their objective of facilitating the development of wind projects.</p>

Source: Columbia County 2007

**Columbia County Zoning Ordinance**

Columbia County has developed code standards and policy standards applicable to wind energy facilities. Code standards have been adopted through Ordinance 2008-004 and include the setbacks described below. Policy standards have been adopted through Resolution 2008-039 and include specific conditions of approval for wind energy facilities, in addition to those described in the county zoning ordinance under Section 33, Conditional Uses.

Rock quarries are a conditional use in the A-1 Zone. Concrete batch facilities are not specifically identified in the Columbia County Code as a separate use, but for purposes of this Project are deemed accessory to the Alternative Energy Facility conditional use and, as such, can be reviewed as a part of that conditional use permit.

The Project within Columbia County is proposed for lands designated A-1 where wind energy facilities are allowed as a conditional use pursuant to Columbia County Resolution 2000-19. The Applicant has not yet sought a CUP from Columbia County, but has publicly announced its intention to seek one for wind energy facility development in the Tucannon and Oliphant Ridge WRAs described in this EIS. Within those areas, the Project, as a use deemed conditionally permitted, will be consistent with agricultural uses and with the continued use of the Project area for agricultural purposes. Wind energy facilities are developed at a very low density across large tracts of land, and result in minimal permanent disturbance to the land. When they are sited on agricultural lands, the traditional farming activities continue contemporaneously; the land is not taken out of agricultural production, except for those areas immediately within the footprint of the access roads, wind turbines, substations, and associated facilities. The presence of the turbines on agricultural land generates sources of additional income to the landowners. This additional income promotes the long-term retention of agricultural lands by enabling landowners relying on agricultural income to withstand cyclical economic downturns without needing to convert to uses incompatible with agriculture.

***Applicable Setbacks***

The setbacks applicable to wind energy facilities, as defined in Ordinance 2008-004, are summarized in Table 2-48. The final Project design will comply with all required setbacks.

***Conditions of Approval***

Columbia County has defined development requirements for the construction and operation of wind turbines, as promulgated in the Columbia County Commercial Wind Turbine Energy Projects Standards of Development.

The Project will comply with the development regulations in Appendix G through the preparation of site plans, engineering designs and plans, Project specific

## **2. Affected Environment and Impacts Land Use and Recreation**

erosion and sediment control plans and drainage plans, and a transportation management plan, as well as through implementation by micrositing. The Project will adhere to all permit conditions.

**Table 2-48 Columbia County Setbacks for Wind Energy Facilities**

Element	Required Setback
Project Boundary	A minimum of 0.25 miles from the boundaries of property that has been purchased or leased for the siting of wind turbines
Paved County Roads and State Highways	A minimum of 1.5 times the height of the wind turbine, measured from the natural surrounding grade to the highest extent of any blade
Urban Growth Area Boundaries	A minimum of 1.5 miles from any Urban Growth Area Boundary existing at the time Project permits are issued

Source: Columbia County Commercial Wind Turbine Energy Projects Standards of Development

### **Columbia County Critical Areas Ordinance**

The GMA at RCW 36.70A.170, Natural resource lands and critical areas – Designations, requires Washington counties and cities to develop Critical Areas Ordinances (CAO) to protect the functions of critical areas. Columbia County’s CAO is applicable to parcels containing designated critical areas or resource lands. Development located in or that is likely to cause impact to resource lands or critical areas must undergo a Resource Lands and Critical Areas Special Study (Columbia County 2008).

Standards and requirements for resource lands are set forth in Section 8 of the Columbia County CAO. Sections 3 – 7 establish requirements for designated critical areas. Applicable development standards, setbacks, and mitigation ratios for critical areas are outlined in Appendix G. Consultation with Columbia County will be undertaken for compliance with its CAO due to the presence of WDFW-designated priority habitat, fish-bearing streams, the presence of steep slopes and wetland features.

Please refer to Sections 2.2 Geology, 2.3 Soils, 2.4 Water Resources, 2.5 Wetlands, 2.6 Aquatic Habitat, Fish Species, and Wildlife, 2.7 Birds and Bat Resources, and 2.8 Vegetation for specific discussions pertaining to the presence of critical areas.

### **Columbia County Shoreline Management Program**

Washington’s Shoreline Management Act (SMA; Chapter 90.58 RCW) regulates development within 200 feet of “shorelines of the state”: the shorelines of marine waters, streams with a mean annual flow greater than 20 cubic feet per second, and lakes 20 acres or larger, or to the edges of wetlands associated with these water bodies. Land use regulations under the SMA are enforced through local shoreline master programs developed by city and county governments which are reviewed by Ecology.



## **2. Affected Environment and Impacts Land Use and Recreation**

There are two shorelines of the state in the Columbia County portion of the Project area: Pataha Creek and the Tucannon River. However, no Project facilities will be located within 200 feet of these shorelines of the state; overhead transmission line crossings may be located within the 200-foot buffer and would be consistent with the County's shoreline regulations.

### Kuhl Ridge, Dutch Flats, and Oliphant Ridge WRAs (Garfield County)

#### **Garfield County Comprehensive Plan**

Garfield County and the City of Pomeroy have adopted a comprehensive plan (Garfield County 2008a), consistent with the planning goals and requirements of the 1990 Washington State GMA. The comprehensive plan addresses eight elements: land use, capital facilities, transportation, housing, utilities, economic development, rural, and parks and recreation. All three WRAs within Garfield County are on land currently designated as rangeland or cropland. These areas are projected to remain agricultural through the planning horizon of the comprehensive plan (until 2023).

The goals, objectives, and policies defined in the Garfield County Comprehensive Plan that are applicable to the proposed Project are listed in Table 2-49. The consistency of the Project with these items is discussed in the table.

As shown in Table 2-49, development of the Project in Garfield County will be consistent with the stated goals and objectives of the Comprehensive Plan for land use, resource protection, economic development, energy conservation, as well as the presence of rural areas.

#### **Garfield County Zoning Ordinance**

The Garfield County Zoning Ordinance specifically allows wind energy facilities in the Agricultural zone with a conditional use permit (Garfield County Zoning Code 1.03.010). The rock quarry operations proposed are permitted outright, provided they are located more than 1,000 feet from any dwelling unit other than the operator's dwelling unit. Quarry sites located closer than 1,000 feet from a dwelling unit require a conditional use permit. The concrete batch plant facilities proposed as part of construction of the Project are permitted as a Conditional Use in the Agriculture zone and can be considered as part of the conditional use permit for wind energy facilities. This Project is proposed for development strictly within the Agricultural zone of Garfield County, and as such, is consistent with adjacent agricultural uses and with the continued use of the proposed Project area for agricultural production. Farming will continue to occur around the turbines and other Project facilities and infrastructure. In addition, the proposed Project will provide a supplemental source of guaranteed revenue to local landowners who participate in the Project, providing additional stability to the local agricultural community.

## 2. Affected Environment and Impacts Land Use and Recreation

**Table 2-49 Garfield County Comprehensive Plan and Project Consistency**

Plan Element	Relationship to Project
<b>Land Use Element</b>	
<p><b>Goal:</b> The City/County will ensure that the character and location of land uses optimizes the combined potentials for economic benefit and the enjoyment and protection of natural and cultural resources while minimizing the threat to health, safety and welfare posed by hazards, nuisances, incompatible land uses and environmental degradation.</p>	<p>The Project will be developed at a very low density across large tracts of land, and will result in minimal permanent disturbance to the land. Traditional farming activities continue contemporaneously; the land is not taken out of agricultural production, with the exception of areas where permanent facilities are sited. The presence of the turbines on agricultural land generates sources of additional income to the landowners. The Project will adhere to various setbacks designed to safeguard health and safety. The use of agricultural land for wind energy harvesting has been deemed compatible with other agricultural uses by the Garfield County Comprehensive Plan.</p>
<p><b>Resource Protection, Policy 7:</b> Maintain and enhance natural resource-based industries, including productive timber, agriculture, and fisheries industries.</p>	<p>The Project will use a natural resource, wind, to generate energy. Land within the Project areas will remain in agricultural production throughout construction and operation of the Project.</p>
<b>Economic Development Element</b>	
<p><b>Goal B:</b> To encourage economic development throughout the city and county that is consistent with adopted comprehensive plans, promote economic opportunity for all citizens of this county, especially for unemployed and for disadvantaged persons, and encourage growth, all within the capacities of the county's natural resources, public services, and public facilities.</p>	<p>The Project will generate temporary and permanent local jobs and will contribute to the local tax base, which effects redound to the respective communities at large, and jurisdictions' ability to serve those communities. See Section 2.15, Socioeconomics, for further details of the economic benefits of the Project. The Project will not require extensions of public utilities and as mitigated, will not be developed or operated in excess of the county's natural resources, public services, and public facilities.</p>
<p><b>Objective C, Policy 1:</b> The county should encourage development of wind generation projects.</p>	<p>The Project will help the County achieve their objective of facilitating the development of wind projects.</p>
<b>Rural Element</b>	
<p><b>Objective C:</b> The economic value and worth of Rural Areas should be recognized and appropriate steps taken to ensure and enhance their long-term survival.</p>	<p>Agricultural production will continue on lands within the Project area with the exception of areas where permanent facilities are sited. The presence of wind turbines on agricultural land will generate sources of additional income to landowners within the Project area, which helps buffer the landowner from harsh economic cycles within the agricultural industry, and the additional income generated from a wind energy facility mitigates against the need to subdivide the property and sell it to supplement income, thereby leaving large swaths of Rural lands intact and protected from sprawl.</p>

Source: Garfield County 2008a

## 2. Affected Environment and Impacts Land Use and Recreation

The Garfield County Zoning Ordinance devotes a specific section, 1.05.090 Wind Power Generators, Solar, and Fuel Cell Energy to requirements and standards for the review and granting of conditional use permits for renewable energy, including wind energy facility conditional use permits. These requirements and standards are additive to, and over and above those that apply to any use for which a CUP is required, including wind energy facilities.

### ***Applicable Setbacks***

The minimal setbacks applicable to a wind energy facility in Garfield County are summarized in Table 2-50. As per Chapter 1.01.030 of the zoning ordinance, the height of a turbine is defined as the “distance measured from the ground level to the highest point on a wind turbine, including the rotor blades”. This is measured as the distance from the ground to the tip of the blade at its highest point.

**Table 2-50 Garfield County Setbacks for Wind Energy Facilities**

Element	Required Minimum Setbacks
Urban Growth Area	Lands within the Urban Growth Area are excluded from wind energy tower siting.
Historical District Impact Area	Lands within the Historical District Impact Area are excluded from the siting of wind energy towers. These lands include all of Section 36, Township 12 N, Range 41 E, W.M.; All of Sections 31 and 32, Township 12 N, R 42 E, W.M., North half of Section 1, Township 11 N, Range 41 E, W.M.; North half of Sections 5 and 6, Township 11N, Range 42 E, W.M.
Highway 12	Outside of the Urban Growth Area: wind energy tower total extended [tip] height plus 100 feet.
County Roads	From the rights-of-way of all county paved or bituminous-surfaced roads: total extended height of the wind energy tower plus 100 feet.  From the rights-of-way of all county gravel or unpaved roads: 100 feet from the closest blade tip of the wind energy tower.
Project Area Boundary	Total extended height of the wind energy tower plus 100 feet, unless waived.
Residences	Minimum of ¼- mile or four times the height of the wind energy tower, whichever is greater.

Source: Garfield County 2008b

### ***Conditions of Approval***

Wind energy facilities must comply with all applicable Garfield County conditions set forth in Section 1.05.090(8) for the Project during construction and operation. These conditions outlined in Appendix G. The Project will comply with the conditions listed in Section 1.05.090(8) through the preparation of site plans, engineering designs and plans, Project specific erosion and sediment control plans and drainage plans, and transportation plans; adherence to permit conditions, as well as through implementation by micrositing.

## ***2. Affected Environment and Impacts Land Use and Recreation***

### **Garfield County Critical Areas Ordinance**

RCW 36.70A.170, Natural resource lands and critical areas – Designations, requires Washington counties and cities to develop Critical Areas Ordinances (CAO) to protect the functions of critical areas. The Garfield County CAO is applicable to parcels containing designated resource lands or critical areas. Development located in or that is likely to cause impact to resource lands or critical areas must undergo a Resource Lands and Critical Areas Special Study (Study) (Garfield County 2008c).

Standards and requirements for resource lands are set forth in Section 7-9 of the CAO. Section 10-14 establishes requirements for designated critical areas. The applicable development standards, setbacks and mitigation ratios for critical areas are outlined in Appendix G. Consultation with Garfield County will be undertaken for compliance with its CAO due to the presence of WDFW-designated priority habitat, fish-bearing streams, the presence of steep slopes, wetland features and well-head protection areas.

Please refer to Sections 2.3 Geology, 2.4 Soils, 2.5 Water Resources, 2.6 Wetlands, 2.7 Aquatic Habitat, Fish Species, and Wildlife, 2.7 Birds and Bat Resources, and 2.8 Vegetation for specific discussions pertaining to the presence of critical areas.

### **Garfield County Shoreline Management Program**

Washington's SMA (Chapter 90.58 RCW) is described under the Garfield County Shoreline Management Program, above. There are two shorelines of the state in the Garfield County portion of the Project area: Pataha Creek and the Tucannon River. However, no Project facilities will be located within 200 feet of these shorelines of the state; overhead transmission line crossings may be located within the 200-foot buffer and would be permitted consistent with Garfield County Shoreline regulations.

### ***End of Design Life Impacts***

Impacts on land use and recreation from end of life alternatives (i.e., decommissioning, repowering) will be similar to those that will result from Project construction activities. Temporary land disturbance will result and there will be spatial and temporal overlap between recreational users and decommissioning or repowering activities. This overlap may result namely in traffic and access delays for recreational users. Both land disturbance and user conflicts will coincide with activities onsite, and will not be permanent impacts. All disturbed areas will be restored through grading and planting. No permanent impacts to land use or recreation are expected to result from repowering turbines or continuing Project operations beyond estimated Project life, as all such future modifications would be expected to remain within the existing Project footprint.

## **2. Affected Environment and Impacts Land Use and Recreation**

If facilities are removed, as under the decommissioning option, land use would be taken out of the commercial/wind generation use and would be returned to prior uses. The decommissioning standard, in particular removal of improvements to a minimum of 3 feet below the surface, would permit restoration of agricultural production at these locations.

### **Mitigation**

Mitigation measures are discussed separately below for land use and recreation.

### **Land Use**

- When grading for construction of new temporary and permanent roads, the topsoil will be stripped and stockpiled, where possible, for restoration, at the completion of construction.
- New road construction and improvements to existing roads will be done according to county ordinances and through approval of the county engineers.
- All temporary roads, temporary shoulders, and disturbed areas will be restored to their original condition upon completion of construction.
- Permanent roads will be maintained for the life of the Project.
- Coordinate Project design with landowners to address agricultural land fragmentation.
- Coordinate with landowners to address restoration of land for agricultural production.

### **Recreation**

- The Applicant contemplates establishing a hunting program on the Project site similar to the program it administers at its other Washington wind energy projects, for example, the Hopkins Ridge facility in Columbia County and the Wild Horse facility in Kittitas County. At these facilities, the Applicant has established rules for hunting activities within the project boundaries. Below are examples of rules of an existing hunting program, which may be applicable to this Project; however, these rules may be subject to change (PSE 2009):
  - No access of any kind is provided within 300 feet of wind turbines or substations.
  - No pointing or shooting of any weapon at a target of any kind with wind turbines, overhead lines, electrical equipment, maintenance vehicles, people, signs, wind farm maintenance facilities, or substations in scope of view.
  - No shooting from vehicles, access roads, or any maintained portion of wind turbine access roads.
  - No vehicle traffic on wind turbine access roads; vehicle traffic on the property is restricted to normally travelled county roads.
  - Do not block access gates or entrances.

## **2. Affected Environment and Impacts Land Use and Recreation**

- No overnight camping/parking or outdoor fires on landowner property unless previously authorized.
  - All hunters must abide by Washington State Game Rules and Regulations.
  - Violators will lose all access privileges.
- The Applicant will encourage landowners within the Project area to continue to allow hunting in the Project area by assisting with the development of written agreements to be signed with interested hunters, as well as through the development of maps depicting property boundaries, Project facilities/improvements, suggested hunting buffer zones around Project facilities/improvements, and habitat areas where big game are more likely to occur.
- The Applicant will work with WDFW and landowners within the Project area to add opportunities for hunting. These additional hunting types could include bow hunting, muzzleloader hunting, and master hunter programs.
- The Applicant will continue to cooperatively work with WDFW on managing big game populations in and around the Project.
- Applicant will coordinate with DNR to address any restrictions on hunting and recreational access to DNR leased lands consistent with DNR leasing authority.

### **2.14.2.2 No Action Alternative**

Under the No Action Alternative, the Project will not be constructed and no wind energy will be produced from the Project area. The Project area could be developed in the future, in accordance with the zoning codes for Columbia and Garfield counties. The range, type, nature, and extent of potential future developments at the Project site include those permitted and conditionally permitted uses in Agricultural (A-1) zones in Columbia County, as per Columbia County Zoning Ordinance Section 9 A-1.

Potential future developments in the Agricultural Zone of Garfield County could include those permitted and conditional uses as listed in the Garfield County Zoning Ordinance Section 1.03.040 Land Use Requirements.

Build out will depend on regional growth trends. Recreational access to private lands within the Project area and recreational areas in the vicinity of the Project area will remain unchanged under the No Action Alternative; however, regional development could result in alterations to access, user experience, and the visual environment.

## **2. Affected Environment and Impacts Land Use and Recreation**

### **2.14.2.3 Probable Significant and Unavoidable Adverse Impacts**

As mitigated, the Project will have no probable significant and unavoidable adverse impacts to land use or recreation.

### **2.14.2.4 Cumulative Impacts**

#### ***Land Use***

Wind turbines will be constructed on agriculturally zoned land in both Columbia and Garfield counties. Existing land use within the Project areas primarily consists of agricultural uses (grains, hay, and row crops) and livestock grazing. These patterns and types of uses will be temporarily impacted during construction and permanent impacts are expected to be minimal due to the relatively small permanent footprint needed for the proposed Project. Rural residential and commercial land uses are also scattered throughout the Project area.

Similar direct impacts, including temporary disturbance of agricultural land during construction and permanent conversion of impacts to agricultural land to utility uses, will be associated with the development of the identified future potential regional wind energy projects, listed as potential interconnection requests in Columbia and Garfield counties (see Table 2-1). The acreage of land temporarily disturbed or permanently converted during construction and operation of these potential projects will be dependent upon the number and size of turbines proposed, as well as the size of support facilities such as substations, O&M buildings, and roads. Even assuming that these facilities will be sited in agricultural areas; however, the zoning controls and development regulations applicable to wind energy within the agricultural areas ensures that existing agricultural uses and activities will not be displaced by these potential wind power facilities, although their collective development will result in the permanent conversion of agricultural land in a proportion that is not a significant impact to the overall amount of agricultural lands. Assuming these projects are subject to the same zoning regulations and are sited on lands of similar use and type and are developed in relatively the same manner as the proposed Project in terms of restoration of temporary impacts and decommissioning requirements with restoration clauses, the permanent impact is expected to be minimal. Any permanent loss of agricultural lands county-wide could be off-set by returning lands currently designated as CRP back into production. In addition, there are CRP lands in both counties which could be put back into agricultural production.

Assessed individually or collectively, the potential regional wind projects are not likely to spur the need for additional commercial development. Additionally, the relatively small number of full-time permanent employees, estimated at a Project total of 89, will not create a cumulative demand for services or create pressure for the conversion of existing land uses. All future wind energy projects will be reviewed by the appropriate county jurisdictions, and will follow the review processes promulgated by those jurisdictions.

## **2. Affected Environment and Impacts Land Use and Recreation**

In addition to the potential wind energy projects described in Table 2-1, two other development projects are proposed for Columbia County. Although a site has not yet been identified, Blue Mountain Station is a 30-acre private industrial development proposal that will cater to natural and organic food processing, and it is assumed that it will be sited within the Dayton Urban Growth Boundary. The second proposed project is the construction of the Columbia County Transportation building within the existing Port of Columbia Industrial Park. While this proposed project will convert undeveloped land to a light industrial/commercial use, no existing agricultural land would be converted. The Port of Columbia Industrial Park and the surrounding area is zoned as commercial; therefore, this Project will generate no cumulative impacts to areas zoned as agricultural are expected.

### **Recreation**

Impacts to recreation associated with the Project and other potential wind energy projects will be temporary. Impacts during construction may include temporarily increases in travel time to recreational areas due to construction traffic traveling on county roads during construction activities. Impacts to landowner-approved hunting and other activities could occur during construction of other wind energy facilities due to conflicts between these activities and construction activities or operations if potential projects do not continue land owner approved hunting programs. The construction periods of most of the identified wind energy projects will overlap with construction of the Project. While the location of the proposed Blue Mountain Station is as-yet unknown, the construction periods for Blue Mountain Station and the Columbia County Transportation building may overlap with construction of the Project as construction of Blue Mountain Station is scheduled to begin within the next five years; construction of the Columbia County Transportation building is scheduled in spring/summer 2009 and may extend into 2010, when construction of this Project is scheduled to start. are unlikely to impact recreation as it is assumed they will be constructed in or near the existing urban growth boundary of Dayton.



## **2.15 Socioeconomics**

### **2.15.1 Affected Environment**

Socioeconomic resources for this analysis are defined as the people, economy, and institutions within this rural part of Southeastern Washington. The WRAs where the turbines will be located straddle Columbia and Garfield counties. The demographic and socioeconomic data for these counties is presented along with select socioeconomic information for adjacent counties in Southeastern Washington. These other counties are also selectively profiled, where appropriate, because this region could be impacted by various phases of the Project.

Garfield County has a land area of 710.5 square miles. It is separated by the Snake River to the north from Whitman County and bounded to the west by Columbia County, to the east by Asotin County, and to the south by the Washington/Oregon border. Columbia County is between Garfield and Walla Walla counties (see Figure 2-21).

#### **2.15.1.1 Population and Housing**

##### ***Population Levels and Trends***

###### All Four WRAs

Columbia and Garfield counties are rural, sparsely populated areas. Table 2-51 shows the population levels, densities (persons per square mile), and recent annual growth rates in these counties.

Columbia County's population has grown slightly since the 2000 census, averaging 0.1% per year, while Garfield's has been declining (OFM 2009a). In contrast, growth in Washington State overall averaged 1.4% per year since 2000. Garfield and Columbia counties are comprised of mostly white populations (96.5% and 94% respectively), with a greater proportion of seniors (persons over the age of 65) compared with the state. Within Columbia County, Hispanics comprised 6.3% of the population, compared with 2% for Garfield County and 12% for Washington State (U.S. Census Bureau 2009).

Long-term trends show that both Garfield and Columbia counties have lost population since 1960. In 1960, Garfield's population was 2,976 people. By 2008, the county had lost 469 residents to stabilize at 2,300, which is 77% of the 1960 level. Columbia's population has declined by 469 residents since 1960, and now stands at 4,100. In contrast, Washington State's population has more than doubled since 1960. For more information on these trends and related socioeconomic history, see Appendix H.

**Table 2-51 Population Levels, Density, and Recent Growth in Columbia and Garfield Counties and Washington State**

	Population Levels		Absolute Change 2000-2008	Average Annual Growth Rate, % 2000-2008
	2000	2008		
<b>Columbia County</b>	<b>4,064</b>	<b>4,100</b>	<b>36</b>	<b>0.1%</b>
Unincorporated	1,279	1,240	(39)	-0.4%
Incorporated	2,785	2,860	75	0.3%
City of Dayton	2,655	2,730	75	0.3%
City of Starbuck	130	130	-	0.1%
<b>Garfield County</b>	<b>2,397</b>	<b>2,300</b>	<b>(97)</b>	<b>-0.5%</b>
Unincorporated	880	775	(105)	-1.6%
Incorporated	1,517	1,525	8	0.1%
City of Pomeroy	1,517	1,525	8	0.1%
<b>Combined County Total:</b>	<b>6,461</b>	<b>6,400</b>	<b>(61)</b>	<b>-0.1%</b>
<b>Washington State</b>	<b>5,894,143</b>	<b>6,587,600</b>	<b>693,457</b>	<b>1.4%</b>
<b>Population Density (persons per square mile)<sup>1</sup></b>				
	<b>2000</b>	<b>2008</b>		
Columbia County	4.7	4.7		
Garfield County	3.4	3.2		
Washington State	88.6	99.0		

Source: Office of Financial Management, State of Washington

Note:

<sup>1</sup> Land area in square miles: Columbia – 868.8, Garfield – 710.5, Washington – 66,544

## ***Housing***

### **All Four WRAs**

It is necessary to know the quantity and quality of existing housing, particularly the availability of temporary accommodations near the WRAs, in order to assess the future impacts of temporary and permanent workforce migration to the region during the construction and operational phases of the Project. Appendix H shows the types of housing units by owner type and vacancy status from the 2000 census. Both Garfield and Columbia counties have a greater share of vacant housing units than the state average. The distribution of vacant units by type is presented in Appendix H. Garfield and Columbia also have significant numbers of vacant seasonal and recreational units within their borders. The location of existing temporary accommodations (provided in Appendix H) is important in assessing the capacity of the area to accommodate construction workers, and also for judging how far they may need to commute to the WRAs.

#### **2.15.1.2 Economy and Employment**

The following section describes the economic base of this region. Labor force size, employment levels and unemployment rates, and long-term trends in employment growth are provided.

***Labor Force, Employment, and Unemployment***All Four WRAs

The recent recession has affected Garfield County's employment situation to a lesser degree compared to Columbia County or the state. While Columbia County's unemployment rate has improved slightly since peaking in March, there has been a noticeable decline in the labor force, meaning that people have stopped actively searching for jobs.

Columbia County's unemployment rate was 12.3% in April 2009. Total employment was 1,353 out of a labor force of 1,542. Garfield County's unemployment rate was 6.3% in April 2009, with total employment of 946 out of a labor force of 1,010. The State of Washington's unemployment rate was 9% in April 2009.

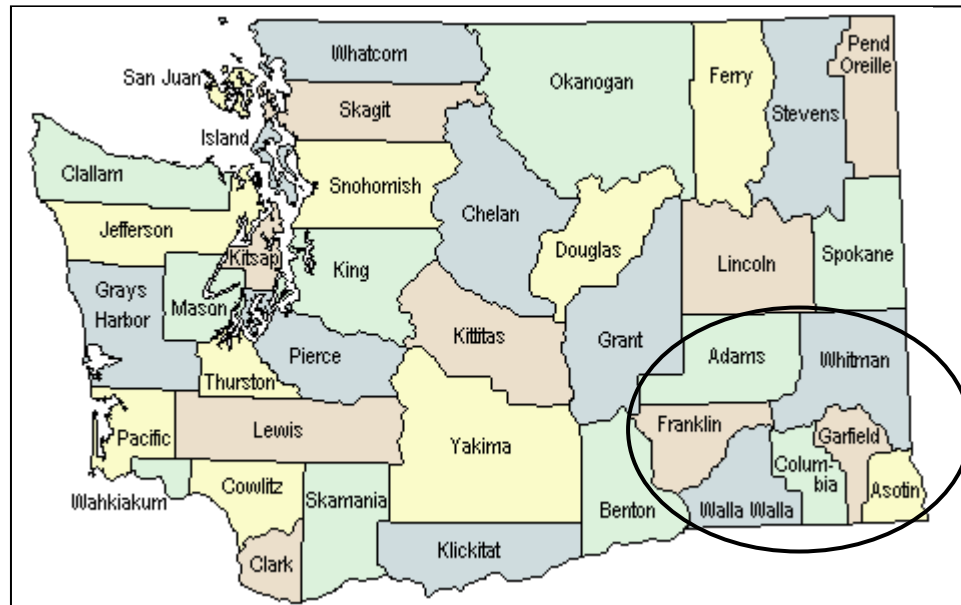
**Employment by Industry and Wages**

The Washington State Employment Security Department provides data on employment by industry and wages by North American Industrial Classification Codes (NAICs) for employment covered under the state unemployment insurance program. The reports show the most important economic sectors to the region. Employment in adjacent counties was reviewed because the combined region could potentially contribute resources for Project construction and operations or provide housing accommodations.

Figure 2-21 shows the adjacent counties that could potentially provide Project related labor and other resources. The industry sectors that are most important to Columbia are government, agriculture, construction and manufacturing. In addition to government, the wholesale and retail trade sectors are relatively important employment sectors for Garfield County. The combined employment base for Garfield, Columbia and the adjacent counties comprising the Southeastern Washington corner (i.e., Walla Walla, Garfield, Columbia, Franklin, Adams, Whitman and Asotin) totaled 89,000 in Q3 2008. Combined agricultural employment for these counties was 13,415, or 12% of the Washington State total, while 4,176 people worked in the construction sector for these counties. Employment is concentrated in fewer sectors in Columbia and Garfield counties than for surrounding counties with more diverse economies.

The average annual wages for all industries combined was \$35,557 for Columbia and \$34,016 for Garfield. These average wages were below the state average of \$47,000, but above the southeastern county regional average of \$32,584. In Columbia, the construction, manufacturing, wholesale trade, and government sectors paid some of the highest wages. In Garfield, wholesale trade, government, and finance were the highest paying employment sectors.

## 2. Affected Environment and Impacts Socioeconomics



Source: State of Washington, Office of Financial Management

**Figure 2-21 Counties in Southeastern Washington State**

The long-term trajectory of total employment levels by county and state show that Columbia and Garfield counties' economies have stabilized at a lower plateau compared to past business cycles and key development and growth stages in their histories. Appendix H contains figures and descriptions of the region's economic history that have influenced long-term employment growth.

### ***Agriculture***

#### All Four WRAs

Agriculture is an important economic sector that defines and distinguishes much of the social and economic character of the rural communities of Garfield and Columbia counties. Both counties devote approximately the same percentage of their total arable land for crop production. In Garfield, 57% of the private land in farms is devoted to cropland, 41% is used as pasture and 2% is for other uses. In Columbia County, private lands are divided as follows: 59% is cropland, 28% is pasture, 4% has other uses, and 9% is woodland. The dominant grain crop commodity is wheat, although barley is also important (USDA 2007a,b,c). Wheat and barley cultivation and production are highly capital intensive and do not require large number of seasonal workers compared with other crops (Garfield County 2008).

Both Garfield and Columbia counties have seen an increase in number of farms between census years 2002 and 2007, although total farm acreage has declined, resulting in slightly smaller farms on average. In the 2007 agricultural census, Garfield had 239 farms with an average size of 1,290 acres, while Columbia had 283 farms averaging 1,107 acres, compared with an average of 381 acres for Washington State farms overall. Wheat and other grains are grown on larger

## 2. Affected Environment and Impacts Socioeconomics

farms compared to crops or livestock. One-third of Garfield's farms were 1,000 acres or more in 2007. The average value of land and buildings per farm was \$1.1 million for Columbia and \$1 million for Garfield in 2007. Net cash farm income was \$6.4 million for Garfield and \$14.8 million for Columbia (USDA 2007b & c). Grain sales dominate the market value of production in both counties that have a greater relative number of operators receiving some form of government payment compared to the state average.

Appendix H contains more detailed data and exhibits that describe the regional agricultural sector including wheat acreage, yields, production, and price histories.

### ***Income***

#### All Four WRAs

In 2007, both Garfield and Columbia counties had at least 14% of their populations living in poverty compared with 11.4% for the state<sup>2</sup>. In 2007, median household income for both Garfield and Columbia was 71% of the Washington average (Census Bureau 2009). Appendix H shows income and poverty indicators for Columbia and Garfield counties and for Washington State. Income and poverty level thresholds developed by the U.S. Department of Housing and Urban Development (HUD) are also reported for each respective county in Appendix H.

Growth in total personal income has been relatively faster for the two counties in recent years, and has contributed to the faster relative growth in per capita incomes for both Garfield and Columbia, evident in 2007. However, per capita incomes are still significantly below the state average. For Garfield and Columbia counties, per capita incomes were 64% and 80% of the state average in 2007, respectively (BEA 2009). Since farm income is a high portion of total personal income for the area, volatility in farm income has contributed to the greater variation seen in total personal income for Garfield and Columbia counties compared to the State of Washington.

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<sup>2</sup> Families and persons are classified as below poverty if their total family income or unrelated individual income was less than the poverty threshold specified for the applicable family size, age of householder, and number of related children under 18 present. The Census Bureau uses the federal government's official poverty definition. If the total income of a person's family is less than the threshold appropriate for that family, then the person is considered poor, together with every member of his or her family. If a person is not living with anyone related by birth, marriage, or adoption, then the person's own income is compared with his or her poverty threshold. The poverty thresholds are updated every year to reflect changes in the Consumer Price Index. The poverty thresholds are the same for all parts of the country they are not adjusted for regional, state or local variations in the cost of living. The specific thresholds used for tabulation of income for particular years are shown at <http://www.census.gov/hhes/www/poverty/threshld.html>.

**Retail Sales**All Four WRAs

Taxable retail sales are the revenue base to which the effective sales tax rates are applied to determine sales tax revenues. Columbia County's taxable retail sales reached \$37.4 million in 2008, more than double the value of Garfield's retail sales of \$16.5 million. The combined 2009 local sales/use tax rate is 7.5% for Garfield County and 7.9% for Columbia County (DOR 2009). Appendix H shows data for taxable retail sales as reported on the excise tax return for cities and counties in Washington State.

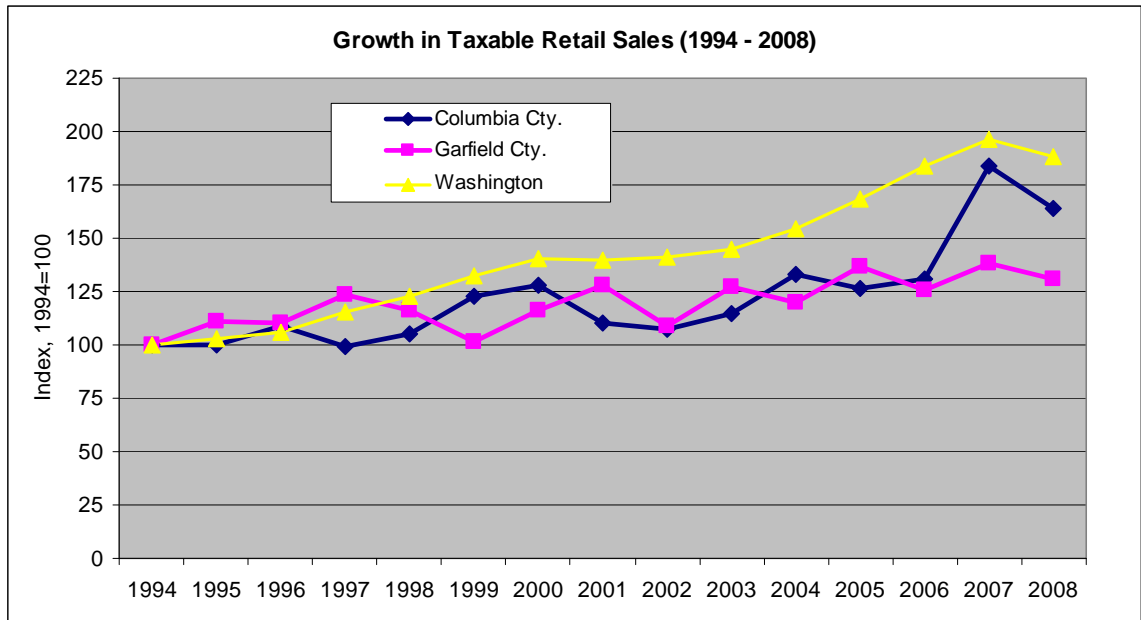
In Washington State, the Revised Code of Washington (RCW) 82.08.02567 exempts from taxation sales related to machinery and equipment used in generating electricity from renewable sources. The sales tax does not apply to sales of machinery and equipment used directly in generating electricity using wind, or to sales of or charges made for labor and services rendered in respect to installing such machinery and equipment. Machinery and equipment means industrial fixtures, devices, and support facilities that are integral and necessary to the generation of electricity using wind as the principal source of power (RCW 82.08.02567). Senate Bill SB 6170-2009-10 renewed the sales tax exemption for these facilities effective July 1, 2009 (SB 6170).

Figure 2-22 shows the comparative growth in retail sales for Garfield and Columbia counties and Washington State since 1994. Starting in 2007, Columbia County experienced a rise in taxable retail sales to a new higher plateau. It is likely that this rise reflected contributions related to wind farm development in the County as the Hopkins Ridge Project came on-line in 2005. The rise in taxable sales from close to \$30 million in 2006 to over \$40 million in 2007 reflected large increases in the following sectors: construction, wood product manufacturing, primary metal manufacturing, wholesale trade, and real estate and rental and leasing. Despite the impact of the recession in 2008, the new higher level of the taxable retail sales base appears to have been sustained.

It is important to note that Washington State changed from an origin-based system for local retail sales tax to a destination-based system effective July 1, 2008, with the passage of Substitute Senate Bill 5089 ("Streamlined Sales Tax"). Before then, Washington retailers collected local sales tax based on the jurisdiction from which a product was shipped or delivered—the "origin" of the sale. Since then, retailers have been required to collect based on the destination of the shipment or delivery. The rule change only affects shipments and deliveries to locations within Washington State. The destination-based sales tax applies to businesses that ship or delivers goods they sell to locations within Washington. Under the new rules, if a retailer delivers or ships merchandise to a buyer in Washington State, the sales tax is collected based on the rate at the location where the buyer receives or takes possession of the merchandise. There is no change for deliveries outside the state or over-the-counter sales in which customers take home goods from a store. The

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change does not affect wholesale sales; services; sales of motor vehicles, trailers, semi-trailers, aircraft, watercraft, modular homes, or manufactured and mobile homes; towing companies; or deliveries to locations outside the State of Washington. Sales tax is based on the seller's location even if the seller delivers the items to customers (DOR 2009).



**Figure 2-22 Growth in Taxable Retail Sales**

It is likely that increases in taxable retail sales from other purchases that don't qualify for the RCW 82.08.02567 tax exemption (from sales related to machinery and equipment used in generating electricity from renewable sources) will be created by the Project. The big ticket machinery and equipment (i.e., the turbines, nacelles, towers, and rotors, etc.) will likely qualify for the exemption. However, purchases for items and supplies needed by construction workers, such as restaurant meals, groceries and water, hotel rooms, clothing, vehicles, gasoline, retail entertainment venues, and other consumables used to support their contract tenures in fabricating the Project would be considered taxable retail sales. In addition, portions of landowner revenues from turbine lease payments will also be spent (recycled back into the local economy) on retail items and these sales will increase the taxable retail sales base. In some communities hosting wind farms, spinoff economic development resulted from retail and wholesale trade businesses that either expanded, or from new establishments that have were created, to support construction workers and their families/dependents during their contract tenures. This economic activity has expanded the taxable retail sales base in these communities (DOE 2004).

## 2. Affected Environment and Impacts Socioeconomics

### Local Government and Sources of Revenue

#### All Four WRAs

Table 2-52 shows the 2007 total revenues and expenditures for each county. Both Columbia and Garfield receive the majority of their resources used to sustain county functions from intergovernmental transfers. Property taxes are the next largest source of revenues.

**Table 2-52 Summary of County Revenues and Expenditures in 2007**

	Columbia (\$)	%	Garfield (\$)	%
<b>Revenues</b>				
General Property Taxes	1,303,590	17.3	482,100	7.1
Sales & Use Taxes	256,838	3.4	104,091	1.5
Other Local Taxes	284,806	3.8	82,858	1.2
Licenses & Permits	153,783	2.0	43,663	0.6
Charges & Fees for Services	506,032	6.7	103,023	1.5
Interest & Investment Earnings	215,370	2.9	358,145	5.3
Fines & Forfeits	119,060	1.6	109,798	1.6
Rents, Insurance Premiums, Internal, Contributions, Miscellaneous	125,732	1.7	231,662	3.4
Intergovernmental Revenues	4,579,908	60.7	5,259,980	77.6
<b>Total Revenues</b>	<b>7,545,119</b>	<b>100.0</b>	<b>6,775,320</b>	<b>100.0</b>
Operating Transfers-In	1,728	0.0	0	0.0
<b>Total Resources</b>	<b>7,546,847</b>	<b>100.0</b>	<b>6,775,320</b>	<b>100.0</b>
Beginning Fund Balance	2,687,343		6,226,089	
<b>Expenditures</b>				
Law & Justice Services	1,298,283	18.0	883,131	13.4
Fire & Emergency Services	479,719	6.6	468,096	7.1
Health & Human Services	483,663	6.7	465,788	7.1
Transportation	1,885,796	26.1	2,011,568	30.6
Natural Resources	815,672	11.3	176,359	2.7
General Government	1,203,401	16.7	739,580	11.2
Utilities	155,238	2.2	47,748	0.7
Capital	895,714	12.4	24,653	0.4
Debt Service-Interest	--		1,724,065	26.2
<b>Total Expenditures</b>	<b>7,217,486</b>	<b>100.0</b>	<b>6,540,988</b>	<b>99.3</b>
Operating Transfers-Out	0	0.0	42,830	0.7
<b>Total Uses</b>	<b>7,217,486</b>	<b>100.0</b>	<b>6,583,818</b>	<b>100.0</b>

Source: Washington State Auditor, Local Government Financial Reporting System (LGFRS)

In terms of expenditures required to sustain county services, the largest common categories are transportation, law and justice, and general government services. In 2007, Garfield also devoted over 26% of its expenditures to meeting debt service.



## **2. Affected Environment and Impacts Socioeconomics**

Related to the issue of sales and use taxes flowing to rural counties is the Engrossed Substitute Senate Bill 6050 (ESSB 6050), creating the City-County Assistance Account (CCAA). The account receives funds from a portion of Real Estate Excise Tax (REET) revenues, which are divided equally between cities and counties for distributions. Similar to the formerly used Motor Vehicle and Excise Tax (MVET) equalization, funds flowing to eligible cities and counties from the CCAA provide unrestricted revenues to jurisdictions according to a statutory formula that takes into account population and relative need. Local officials and others sometimes refer to these distributions as “6050” funds (JLARC 2008).

A county’s funding under the city-county assistance program would not be affected by changes in the total assessed values in the county. RCW 43.08.290(3) lays out the distribution of receipts from the real estate excise tax city-county assistance account to the counties. The statute provides that the county will receive funding under one of three calculations. None of the calculations are impacted by assessed property values. The first two calculations are based on sales and use tax collections and the third is tied to local government assistance provided by section 716, chapter 276, Laws of 2004, in connection with the repeal of the motor vehicle excise tax (MVET).

Based on the statute, the changes (increase) in total assessed property values in each county as a result of the Project will not adversely affect that county’s receipt of funds from the city-county assistance program. Funding under the program may vary based on the level of real property transactions in the State and on the year-to-year appropriations approved by the legislature, but is not impacted by a change in assessed values within a county. Therefore, because assessed values are not an element of the program, there is no impact to either county related to CCAA funds. This is borne out by Columbia County’s experience. Columbia County receives continued CCAA funding despite three commercial wind projects operating there.

### **2.15.2 Impacts and Mitigation**

#### **2.15.2.1 Preferred Alternative**

This section describes the anticipated socioeconomic impacts from the Preferred Alternative. Based on cumulative wind power generation capacity already in place, the proposed Project’s commissioning (at full build out) will more than double Washington’s total installed wind capacity (DOE 2008)<sup>3</sup>. Key issues related to socioeconomic resources have been voiced by Project participants and stakeholders. Among the socioeconomic issues discussed in this section are economic impacts and jobs, agricultural impacts, tax and fiscal impacts, recreation and tourism, and property values. These discussions apply to all WRAs.

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<sup>3</sup> According to the AWEA project database, Washington’s cumulative wind generation capacity at year end 2007 was 1,163 MW, placing the state 5<sup>th</sup> in the U.S. in terms of developed capacity.

***Construction Impacts***All Four WRAs

The construction of the Project will be a continuous endeavor. The activities will proceed uninterrupted and could potentially last for up to five years because of the proposed wind farm's large scale. Construction activities will not be intermittent, but will happen continuously and employ resources in a constant, steady fashion over this period.

**Population and Housing*****Population***

The Project will temporarily increase the region's population levels. Part of the Project's construction workforce will temporarily relocate to Garfield and Columbia counties for the duration of their tasks. These workers will add diversity to the composition of the population base and will contribute to stabilizing some of the declining trends in population growth documented in the supplemental report exhibits for Garfield and Columbia (see Appendix H). It is estimated that 250 workers (see Table 1-4) will be directly employed during each construction phase. A large number will temporarily relocate to and reside in Garfield, Columbia, and surrounding counties to be as close as possible to the Project's WRAs. In past projects up to 30% of the total construction workforce were hired locally from the surrounding region. A conservative estimate is that up to one half (approximately 87) of the remaining (non-local) construction workers may temporarily relocate to the area for the length of the construction period based on past projects. Given the large size of the Project and multi-year construction period, it is likely that some workers migrating to the area will bring their families and dependents with them. It is also likely that some families will have school aged children. These school aged children would likely become be enrolled in either the Garfield (Pomeroy) and/or Columbia (Dayton) school districts. Based on experience with other wind development projects in the region, these additional enrollments are likely to be minimal during the construction period and are unlikely to cause the school districts to make adjustments in facilities or staffing.

Workers who relocate to the region will temporarily increase the so-called "transient" population levels of the combined two county regions. The temporary population increase is expected to be noticeable within Garfield and Columbia counties given their relatively small populations compared to the surrounding seven counties of the Southeastern region. During peak construction, 250 workers may be commuting to the WRA work sites from area permanent residences (i.e., the local native residents working on the Project), hotels/motels, B&Bs, RV and camping sites, and apartments rented in Garfield and Columbia counties. For addresses of the temporary housing accommodations, refer to Appendix H. In past wind projects in Columbia County such as Hopkins Ridge, a few workers commuted from as far away as Walla Walla (see discussion under housing below).

***Housing***

The Project is expected to increase the demand for the permanent and temporary housing stock and accommodations in the region. It is estimated that approximately 87 workers will require housing during their contract tenures. The workers migrating to the region may place demands on temporary housing accommodations (B&Bs, hotels/motels, RV camp sites) and also on vacant and seasonal housing units, lasting for a multi-year period. A list of temporary accommodations and a table of vacant housing units by type is provided in Appendix H. Based on past project experience there is usually a combination of hotel/motel rooms and apartments being leased concurrently during construction phases. The region has sufficient temporary and permanent housing capacity to accommodate these workers and their families/dependents. The demand will provide a stimulus to regional hotels/motels/B&Bs, and RV sites and will also generate hotel bed taxes to the region.

In Columbia County, it was reported that hotel/motel and RV/camping sites experienced record occupancy and utilization during construction of the Hopkin's Ridge and Marengo I and II projects. During this Project similar changes to occupancy and utilization will likely occur in Garfield and Columbia counties. For Hopkins Ridge and Marengo, some workers lived in area hotels and also rented apartments and paid market rates out of their per diem budgets (Dickenson 2009). While all local hotels/motels experienced record demand, some workers temporarily resided as far away as Walla Walla and commuted approximately 30 miles to the project sites. A list of hotels/motels and RV camping sites and rental units within Columbia, Garfield, and Walla Walla counties is provided in Appendix H. These facilities are expected to increase occupancy and utilization from the temporary demand for housing expected during the construction phase. This temporary incremental demand will likely persist for several years.

**Economy and Employment – Economic Impacts**

Building a wind farm at the proposed large scale will employ hundreds of workers over a multi-year period. Construction of the Project will result in a direct, positive short-term increase in economic activity within Garfield and Columbia counties and the Southeastern Washington region. Employment, income, and output will be stimulated during each phase of the Project.

The supply chain supporting wind farm construction and erection is extensive and can stimulate economic development in a wide area. For example, a review of firms supporting and comprising the wind development industry and discussions with Washington State wind farm project participants shows an extensive and varied array of suppliers. The national suppliers run from companies providing such items as rammed aggregate pier foundation systems to specialized mobile ready-mix concrete plants, from trucking companies providing trailers for extra wide loads to electrical contractors providing transmission interconnect services. Other suppliers are manufacturers of turbines, specialized cranes, rotors, blades,

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gears, towers, LED FAA obstruction lights for marking wind turbines, blade automation systems, electrical systems, specialized sky lifts for maintaining wind turbines, foundation specialty contractors, and EPC and balance of plant (BOP) general contractors (NAWP 2009). As the above few examples illustrate, hundreds of industries can both directly participate in and be indirectly stimulated by these projects.

Given the specialized nature of the infrastructure and components, most of the capital goods and wind farm components will be manufactured and procured from outside the region. Economic activity during construction will reflect mostly labor for installation, erection, and assembly and purchase of locally available materials.

To indicate the site assembly effort of wind farm construction, Table 2-53 shows the breakdown in man-hours and approximate full-time equivalent labor for a typical 100-MW wind farm (DOE 2004).

**Table 2-53 Site Services and Approximate Manpower Associated with a Typical 100-MW Windfarm<sup>1</sup>**

Service	Man hours	Hours (%)	Estimated FTE/Year <sup>1</sup>
Turbine & tower installation	121,080	28.9	60.5
Concrete construction	72,000	17.2	36.0
Equipment transportation	42,650	10.2	21.3
Project management	36,775	8.8	18.4
Engineering and surveying	25,300	6.0	12.7
Vendor field	20,535	4.9	10.3
Road building	18,940	4.5	9.5
Underground cable installation	17,250	4.1	8.6
General labor	15,000	3.6	7.5
Local material delivery	12,500	3.0	6.3
Electrical installation	8,770	2.1	4.4
Concrete	6,800	1.6	3.4
Equipment repair & fueling	6,000	1.4	3.0
Inspection and testing	5,000	1.2	2.5
Food preparation & delivery	3,500	0.8	1.8
Housing and lodging	3,000	0.7	1.5
Real estate & legal	2,800	0.7	1.4
Communication system	1,120	0.3	0.6
<b>Total</b>	<b>419,020</b>	<b>100</b>	<b>210</b>

Source: DOE 2004

Note:

<sup>1</sup> Applies a 2,000-man-hour year to estimate full-time equivalents (FTE) based on a 40-man-hour week and 50 weeks.

Estimates of full-time equivalent (FTE) jobs corresponding to the site services were based on an equivalent labor factor of 2,000 man hours per worker per year.

## **2. Affected Environment and Impacts Socioeconomics**

This factor assumed a 40-hour work week for 50 weeks. Some workers work 50–60-hour weeks, making the FTE jobs estimates slightly lower. Assuming a 50-hour man week, the full-time jobs equivalent is 168 jobs for all the listed site services performed over a man year.

This discussion focuses on isolating local increases in economic activity within the Southeastern Washington region. This region has been defined as the combined areas of Asotin, Garfield, Columbia, Walla Walla, Whitman, Franklin and Adams counties. Anecdotal reports from other completed projects in Washington relate that construction workers and contractors have made extensive use of existing resources within local/host regions, and that they purchase supplies, materials, and equipment that are readily available locally. These purchases have stimulated the demand for goods and services in communities and can stimulate additional economic development, especially where the projects are large scale and involve multi-year construction phases and upgrades (Strand 2009).

A review of recently completed projects helps project the anticipated economic activity and regional stimulus from the Project.

Table 2-54 shows key Project indicators and available economic impact measures for completed projects in Washington State, with the exception of the Desert Claim Wind Project (shown in the first column, which has not yet been constructed. The estimates, based on an initial Project configuration, have been included for comparison but may be modified based on final permitting. The table shows attributes and relationships that can be used to compare and benchmark the likely impacts of the Project. For example, the number of construction phase jobs per MW of nameplate capacity is close to 1.0 (based on the four completed projects in Washington), but is expected to be slightly higher based on recent estimates for the Desert Claim Wind Project. The four completed projects displayed in Table 2-54 totaled 681 MW in nameplate capacity. At 1,432 MW, the proposed Project will more than double this installed capacity (not including the Desert Claim Wind Project).

While the specific Project phasing is not yet known, it is assumed for this discussion that construction will take place in four or more phases. The impacts were estimated by pro-rating the total cumulative impacts equally over a five-year period, with each construction phase lasting from 9 to 12 months. Actual construction phasing will be determined by a variety of factors. Since economic impact studies typically report economic impacts estimates on an annual basis, the Project impacts are first presented for the entire Project (cumulative over 2010 to 2014) and are also presented on an annual basis. This allows easy comparison with past completed projects that have focused on annual impacts.

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**Table 2-54 Washington State Wind Farms – Key Project Attributes and Economic Impacts**

Project Name/Location	Desert Claim Wind Project, Kittitas County	Wild Horse Wind, Kittitas County	Hopkins Ridge Wind Farm, Columbia County	Big Horn Wind Power Project, Klickitat County	Nine Canyon (I, II, & III), Benton County
Project size (MW)	190	228.6	156.6	200	95.9
Turbines (No.)	95	127	87	133	63
Average turbine capacity (MW)	2.0	1.8	1.8	1.5	1.5
Total construction employment (No.)	282	250	175	200	
Local construction employment (No.)	160	83			
Full-time employees (O&M)	25	25	22	11 (75% [8] local hires)	
Local construction spending (\$million)	17.3	8.4			
Year online	2010	2006	2005	2006	2003
Total annual property taxes (\$)	1,259,236	1,300,000	807,310	1,100,000	
School district (\$)	299,838	480,000	169,805		
State school fund (\$)	339,205	402,000	149,873		
County general fund (\$)	142,766	162,500	115,565		
Information sources (see below)	14, 15	1, 2, 3	1, 4, 5, 9, 13	6, 7, 8, 10, 11	12
Annual energy produced equivalent (households)	49,932	60,000	40,000	60,000	25,203
Construction jobs per MW nameplate	1.48	1.09	1.12	1.00	
Local spending per MW (\$)	91,053	36,745			
Annual property taxes per MW (\$)	6,628	5,687	5,155	5,500	
Project area (acres)	5,200	8,600	11,000	15,000	
Acres per MW	27	38	70	75	
Project footprint (acres)			108	70	
Project footprint / total acres (%)			1.0	0.5	
Annual visitors	NA	18,000	2,250		

**Table 2-54 Washington State Wind Farms – Key Project Attributes and Economic Impacts**

Project Name/Location	Desert Claim Wind Project, Kittitas County	Wild Horse Wind, Kittitas County	Hopkins Ridge Wind Farm, Columbia County	Big Horn Wind Power Project, Klickitat County	Nine Canyon (I, II, & III), Benton County
Number of leases			11	5	
Average annual output (MWh)	499,320		456,000		
Average capacity factor (%)	30		33.2		

Notes:

This table does not include all taxing districts and taxing structure varies across counties.

Information Sources:

- 1 Wind Power and Economic Development February 2009, Renewable Northwest Project
- 2 AWEA
- 3 PSE, <<057\_Wild Horse\_English.pdf>>, <http://www.efsec.wa.gov/wildhorse.shtml>
- 4 PSE, [http://www.pse.com/energyEnvironment/energysupply/pages/EnergySupply\\_ElectricityWind.aspx?tab=2&chapter=5](http://www.pse.com/energyEnvironment/energysupply/pages/EnergySupply_ElectricityWind.aspx?tab=2&chapter=5), "Wind Power-Creating Benefits for Columbia County - Puget Sound Energy"
- 5 Economic Impact of Wind Energy Projects in Southeast Washington, Entrix, March 6, 2009
- 6 PPM Energy Press Release, [http://www.iberdrolarenewables.us/rel\\_05.10.28a.html](http://www.iberdrolarenewables.us/rel_05.10.28a.html)
- 7 [http://www.iberdrolarenewables.us/rel\\_07.05.21.html](http://www.iberdrolarenewables.us/rel_07.05.21.html), press release
- 8 <http://www.thedalleschronicle.com/news/2007/05/news05-22-07-01.shtml>
- 9 [www.ecy.wa.gov/climatechange/CATdocs/wpc\\_JobsAnalysis.pdf](http://www.ecy.wa.gov/climatechange/CATdocs/wpc_JobsAnalysis.pdf)
- 10 [http://seattletimes.nwsources.com/html/localnews/2003070559\\_wind19m.html](http://seattletimes.nwsources.com/html/localnews/2003070559_wind19m.html)
- 11 [http://www.rnp.org/News/pr\\_YesOn937\\_SignaturesJul06.htm](http://www.rnp.org/News/pr_YesOn937_SignaturesJul06.htm)
- 12 [http://www.energy-northwest.com/generation/nine\\_canyon.php](http://www.energy-northwest.com/generation/nine_canyon.php)
- 12 [http://www.energy-northwest.com/generation/documents/Nine\\_Canyon\\_Facts\\_09.pdf](http://www.energy-northwest.com/generation/documents/Nine_Canyon_Facts_09.pdf)
- 13 PSE Wind Power - Creating benefits for Columbia County, 4153\_008 08/08
- 14 Economic Impacts of the Desert Claim Wind Project - A Report to the enXco Company, ECONorthwest, April 21, 2009
- 15 Kittitas County Economic Impacts from the Proposed Desert Claim Wind Power Project, Feb. 25, 2009, Central Washington University
- 16 Economic Impacts of Wind Energy Projects in Southeast Washington, Entrix Inc., March 2009

## 2. Affected Environment and Impacts Socioeconomics

Table 2-55 shows the applicable Project and construction cost data used as inputs to the economic impact analysis.

**Table 2-55 Lower Snake River Wind Energy Project Attributes and Estimated Construction Costs**

Project Location	Garfield & Columbia counties
Construction year	2010 (First Phase)
Project size nameplate capacity MW	1,432
Number of turbines	795
Turbine size (MW)	1.80*
Construction cost (\$/KW-e)	2,700
Estimated total cost (\$million)	3,866
Terminal construction year	2,014

Key:

KW-e = Kilowatt of electricity

\*See Section 1.5.3.1 Turbines for a discussion of the range of turbine sizes.

Source: RES/PSE

A range of economic impact estimates is presented, based on construction costs spanning \$2,000/kilowatt electricity (KW-e) to \$2,700/KW-e. Total economic impacts consist of direct, indirect, and induced effects that account for the Project's total spending stimulus on other economic sectors and households throughout the lower Southeastern region of Washington State. Indirect impacts relate to the additional spending stimulus that is triggered initially by the direct construction expenditures. The direct or first round of expenditures affect suppliers and other firms comprising the regional supply chain for wind infrastructure. Induced impacts account for spending by households earning incomes from both directly impacted businesses and indirectly affected industries.

The methods used to project the annual economic impact estimates were based on generally accepted procedures used in economic impact analyses of wind energy projects and applied to a regional (Southeastern Washington combined county) dataset. The methods are described in detail in Appendix H.

The economic impact estimates for the range of Project costs are presented in Table 2-56. The output and earnings multipliers applicable to the Southeastern Washington region were 1.5 on average. The aggregate multiplier is an average of all of the constituent industries that may be impacted. The multiplier is equal to the total impact divided by the direct impact stimulus, so a \$1,000 stimulus to demand for the region, would result in a \$1,500 total change in economic activity. The range of multipliers per each constituent industry sector varied. The size of the multiplier reflects the extent of the supply chain that would be linked to the direct Project activities within the counties studied. A larger multiplier would have been associated with total Washington State impacts and for national impacts, but the region of influence chosen for this analysis were the combined counties of Asotin, Adams, Franklin, Walla Walla, Whitman, Garfield and Columbia (see Figure 2-21).



## 2. Affected Environment and Impacts Socioeconomics

**Table 2-56 Estimated Economic Impacts during Construction Phases of the Lower Snake River Wind Energy Project**

	Low (Cost = \$2,000/kw-e)			High (Cost = \$2,700/kw-e)		
	Jobs	Earnings <sup>a</sup>	Output	Jobs	Earnings <sup>a</sup>	Output
<b>Estimated Impacts – All Construction Phases</b>						
Direct	937	\$44.5	\$126.9	1,265	\$60.0	\$171.3
Construction Sector	885	\$42.4	\$122.2	1,195	\$57.2	\$165.0
Other Industry Sectors	52	\$2.1	\$4.7	70	\$2.8	\$6.3
Indirect	316	\$11.1	\$34.2	426	\$15.0	\$46.1
Induced	358	\$11.8	\$34.3	483	\$15.9	\$46.3
Total Impacts	1,611	\$67.3	\$195.3	2,174	\$90.9	\$263.7
<b>Estimated Impacts per Construction Phase<sup>b</sup></b>						
Direct	187	\$8.9	\$25.4	253	\$12.0	\$34.3
Indirect	63	\$2.2	\$6.8	85	\$3.0	\$9.2
Induced	72	\$2.4	\$6.9	97	\$3.2	\$9.3
Total	322	\$13.5	\$39.1	435	\$18.2	\$52.7

<sup>a</sup> Earnings are total labor income, which includes the sum of employee compensation and proprietor income.

<sup>b</sup> Assumes a total of five construction phases with each phase lasting from 9 to 12 months in duration.

### *Employment Impacts*

The Project's five construction phases are estimated to generate a grand total of between 1,611 and 2,174 jobs, over a five-year period from 2010 to 2014. On an annual average basis, or per each individual 9–12 month construction phase, it is estimated that between 322 and 435 total jobs will be generated within the region. The jobs estimates include the full multiplier or ripple effect estimated with the IMPLAN economic input-output model multipliers reflecting the economic structure of the southeastern Washington region. Both indirect and induced employment that will be generated in other linked industries and sectors is also shown in Table 2-56. The jobs estimates are for both full and part time employment.

The direct construction workforce per each construction phase is estimated to be 253 workers under the \$2,700/KW-e cost scenario. The direct construction labor force will be comprised of the following activity-based teams and disciplines: engineering, surveying and design personnel, road construction, foundation construction, electrical collection system workers, substation construction, wind turbine assembly and erection, plant energization and commissioning, and construction punchlist (see Table 1-4). The construction workforce will be comprised of project managers and engineers, field technical staff, skilled labor, equipment operators, and unskilled labor.

During construction of the Hopkins Ridge project, 175 jobs were created, with approximately 25% (44) being filled by local residents (PSE 2008). It is expected that similar local opportunities will be available for workers within Garfield and Columbia counties, as well as the surrounding and adjacent counties referenced.

## **2. Affected Environment and Impacts Socioeconomics**

In past projects, developers/sponsors have hired local workers if they were available and could contribute to various phases of the project's installation.

### ***Industrial Output Impacts***

The Project's five construction phases are estimated to generate a grand total of between \$195 million to \$264 million in cumulative industrial output from 2010 to 2014. On an annual basis, or per each individual 9–12 month construction phase, it is estimated that between \$39 million and \$53 million will be generated within the region. Total industrial output is the total value of goods and services produced in the economy. The output estimates include the full multiplier or ripple effect estimated with the IMPLAN economic input-output model multipliers reflecting the economic structure of the southeastern Washington region.

### ***Labor Income Impacts***

The Project's five construction phases are estimated to generate a grand total of between \$67 million and \$91 million in labor income. Labor Impact is a subset of total Industrial Output Impacts described above. Labor income represents the income earned corresponding to the industrial production generated by the Project, and is a component of the income equals production identity. When labor income, plus other forms of income such as rents, interest and profits are combined, then under the Gross Domestic Product /National income identity accounting framework, total income should equal the total value of industrial production. The total industrial production should be equal to the total income earned by producers. On an annual basis, or per each individual 9–12 month construction phase, it is estimated that between \$13.5 million and \$18 million in income will be generated within the region. Labor income includes both employee compensation earnings and proprietor income. Employee compensation includes workers' wages and salaries as well as other benefits such as insurance and retirement. Proprietor's income includes payments received by small business owners or self-employed workers.

Anecdotal reports from observers of past wind farm developments (Hopkins Ridge and Marengo) in Columbia County indicate ripple effects from the projects. For example, workers rented apartments during the construction period and also purchased furniture and appliances from local businesses during their tenures. Local hotel/motel occupancy was at a record high between March and October. Local firms supplied general contractors and specialty subcontractors with numerous supplies including gasoline and tires for cars, trucks, and equipment; cement; rental equipment; office supplies; work clothes; and gear. On the Stateline Project, the contractor purchased several trucks from a local dealership (Strand 2009).

Estimating precisely how many consumables will be purchased locally depends on the developer's relationship with a particular general contractor or subcontractor, or the particular EPC contractor or BOP service provider.

## **2. Affected Environment and Impacts Socioeconomics**

However, it is clear from past projects that developers and contractors make extensive use of local resources and purchase supplies and materials that are readily available, and also hire local workers where the local capacity exists to perform services and subcontracts.

### ***Taxes***

In Washington State, RCW 82.08.02567 exempts from taxation sales related to machinery and equipment used in generating electricity from renewable sources. The sales tax does not apply to sales of machinery and equipment used directly in generating electricity using wind, or to sales of or charges made for labor and services rendered in respect to installing such machinery and equipment. Machinery and equipment means industrial fixtures, devices, and support facilities that are integral and necessary to the generation of electricity using wind as the principal source of power (RCW 82.08.02567). Senate Bill SB 6170-2009-10 Environmental Tax Incentives renewed the sales tax exemption for these facilities effective July 1, 2009 (SB 6170).

However, it is likely that construction period sales/use tax and other tax revenues (such as payroll) will be generated from other activities that are not covered under the RCW 82.08.02567 renewables exemption. These other sales and use and other temporary tax revenues can be expected to arise from mobilization of resources and concentration of workers within the region across the entire supply chain likely to be impacted. Taxes related to such items as hotel stays and purchases on other consumables and equipment that will fall outside of the RCW 82.08.02567 renewable exemption will be included. Given the scale of the total industrial output expected to be generated annually across the region, sales and use taxes generated from Project activities during the construction period could be \$1.2 million to \$1.58 million.

### **Agriculture**

Agricultural impacts during construction are discussed below under Facility Impacts.

### ***Project Facility Impacts***

This section discusses the likely impacts during the operational phase of the Project. The design life of the Project infrastructure is expected to be 25 years. The operational period impacts are presented on an annual basis, and have not been summed and presented in cumulative present value terms. Most of the operational period impacts will recur annually over this 25-year period.

## **Population and Housing**

### ***Population***

Project operations are expected to result in a small increase in the region's permanent resident population. Wind farms employ a small number of permanent staff. Some of the operational and maintenance staff will be hired from within the

## **2. Affected Environment and Impacts Socioeconomics**

area while some permanent workers may relocate to Garfield, Columbia, or immediately adjacent counties. For the Hopkins Ridge and Marengo projects (total 367.2 MW of installed capacity), permanent employment to operate the facilities was 39 workers (Entrix 2009). Observers in Columbia County have noted that the permanent workers who are involved in plant O&M are generally younger and are starting families in the region.

For the proposed Project, up to 89 direct local permanent staff are projected to be required for the daily management and O&M of the facility. Based on past projects, a large share of these workers may be hired from the region. It is likely that workers who do relocate from outside the region will have families and dependents. It is assumed that one-half of the 89 workers (rounded to 45) will relocate from outside the region. Assuming all of the operations and maintenance staff have families with school aged children, there is the potential for approximately 45 new enrollments in either the Garfield (Pomeroy) and/or Columbia (Dayton) school districts, or nearby school districts in other counties such as Walla Walla County.

Some stakeholders have wondered about the potential long-term impact to population levels to communities that are hosting wind farms. Questions about a potential negative population effect or “chilling effect” on long-term population net migration have been voiced. To address these concerns the following table was prepared showing the composition of population growth or change in counties that have already installed wind generation projects, some of which have been operating for a number of years.

The top portion of Table 2-57 shows the components of population growth between 2000 and 2007 for Washington counties with installed wind generation capacity. Net or residual migration is the portion of change attributable to new residents coming into an area. While some of the wind farms (Big Horn and Wild Horse) have been operating for only a few years, Stateline and Nine Canyon came online in 2001 and 2002. These counties experienced positive net migration between 2000 and 2007. While numerous factors can influence net migration to a region, if the chilling effect were present and posed a material risk to population growth in these areas, evidence of this effect in the smaller counties’ net migration levels would be expected. However, these effects are not seen. The ratios of net migration to the total population change are also shown to normalize the summaries for county population size. The bottom portion of Table 2-57 shows other counties without wind farm assets for comparison.

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**Table 2-57 Population Growth and Wind Farms by County – Components of County Population Change 2000 to 2007 & Wind Project Developments**

County	Walla Walla	Benton	Columbia	Klickitat	Kittitas
<b>Counties with Wind Farms</b>					
Estimated Births	4,971	15,192	229	1,567	2,471
Estimated Deaths	3,751	7,129	312	1,190	1,726
Natural Increase	1,220	8,063	-82	378	746
Net Migration	1,900	12,362	118	361	4,192
Total Change	3,120	20,425	36	739	4,938
Net Migration / Total Change	60.9%	60.5%	328%	49%	85%
Project Name	Stateline Wind Energy Project	Nine Canyon Wind Farm	Hopkins Ridge	Big Horn Wind Power Project	Wild Horse Wind Power Project
Year Online	2001	2002	2005	2006	2006
<b>Adjacent or Contiguous Counties (without Wind Farms)</b>					
County	Franklin	Grant	Whitman	Skamania	Chelan
Estimated Births	9,273	9,940	2,887	712	6,448
Estimated Deaths	2,013	3,924	1,563	498	4,141
Natural Increase	7,260	6,016	1,324	214	2,308
Net Migration	10,793	1,786	636	614	2,276
Total Change	18,053	7,802	1,960	828	4,584
Net Migration / Total Change	59.8%	22.9%	32.4%	74.2%	49.7%

Sources: State of Washington Office of Financial Management, 2007 Data Book, AWEA project database

### ***Housing***

Workers migrating to the area to operate and maintain the wind farm are expected to number up to one half of the permanent operational workforce high estimate of 89. Assuming a family size of 3 persons, it is possible that between 105 and 135 ( $1/2 \times 69 \times 3$ , and  $1/2 \times 89 \times 3$ ) persons may be permanently relocating to the area placing incremental demands on area housing facilities. It is expected that the upward potential total demand for 45 housing units can be accommodated by the region's permanent housing stock, and therefore the housing impact will be minor. Appendix H contains a table of vacant housing units by type for Garfield and Columbia and shows a combined number of 632 vacant units (Garfield 301 and Columbia 331).. Therefore, the expected incremental demand to area housing facilities will be minimal. The region has sufficient permanent residential capacity to accommodate the small number of workers and their families who may relocate to the area.

**Economy and Employment – Economic Impacts**

***Employment***

Wind generation infrastructure is characterized by relatively high capital costs, but relatively lower longer-term O&M costs compared with other sources of power generation relying on fossil fuels. Fewer workers are required to operate and sustain the assets over the plant’s useful life. A review of past projects in Washington shows a small number of permanent workers hired to operate and sustain the plant and equipment (see Table 2-54).

The Project is expected to require up to 89 direct local permanent staff for daily management, operation, and maintenance of the facility. Because of the very large scale of this Project, a low-high permanent direct employment range is provided in Table 2-58 (between 69 and 89 direct jobs). It is also expected that annually recurring operational spending on maintenance and spending associated with wages will generate additional jobs within the region. The indirect and induced jobs anticipated during Project operations were estimated with IMPLAN multipliers for the region and are shown in Table 2-58. The Project can potentially support between 105 and 136 long-term permanent jobs (across the region) after multiplier effects are taken into account.

**Table 2-58 Estimated Annually Recurring Economic Impacts  
from the Project during Facility Operations**

	Low	High
<b>Employment (No. Jobs)</b>		
Direct	69	89
Indirect	19	24
Induced	17	23
<b>Total</b>	<b>105</b>	<b>136</b>
<b>Earnings (\$)</b>		
Direct	\$5,391,775	\$6,954,608
Indirect	\$1,343,743	\$1,733,234
Induced	\$1,426,230	\$1,839,630
<b>Total</b>	<b>\$8,161,748</b>	<b>\$10,527,473</b>
<b>Industrial Output (\$)</b>		
Direct	26,343,072	33,869,664
Indirect	7,151,308	9,194,538
Induced	6,680,745	8,589,529
<b>Total</b>	<b>40,175,124</b>	<b>51,653,731</b>

***Industrial Output***

The operation of the facility will involve direct spending on salaries, supplies, and equipment and specialty subcontracts to sustain the assets over their useful lives. The annual O&M spending anticipated with a project of this size was estimated using actual project data compiled by the Berkeley Laboratory database. The Berkeley data show that O&M costs have been falling rapidly. For capacity

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weighted average O&M costs, O&M costs per MWh were \$20/MWh in the 1990s and fell to \$9/MWh in the 2000s (DOE 2008). To estimate the annual O&M low and high ranges for the Project, \$7/MWh and \$9/MWh were used. To estimate the annual power produced in a steady state year (i.e., with all turbines installed) a 30% capacity factor was used.

The industrial output impact estimates also applied the IMPLAN multipliers for the region to estimate total impacts including ripple effects. Table 2-58 shows that the direct O&M spending can be amplified to generate an annually recurring total of \$40.2 to \$51.7 million in industrial output throughout the region. The anticipated economic impacts are expected to recur annually and to last for the duration of the useful life of the Project.

### ***Labor Income***

To estimate earnings associated with the Project's permanent direct employment payroll, the range of low to high employment estimates were multiplied by a fully loaded annual wage rate (including benefits) adapted from the Desert Claim Wind Farm economic impact study. To estimate the total earnings including indirect and induced impacts, the IMPLAN multipliers for the region were used. During a steady state year (after all 795 turbines have been installed, by 2014–2015) it is estimated that Project operations will generate between \$8.2 million and \$10.5 million in income to the region annually.

### ***Landowner Revenues***

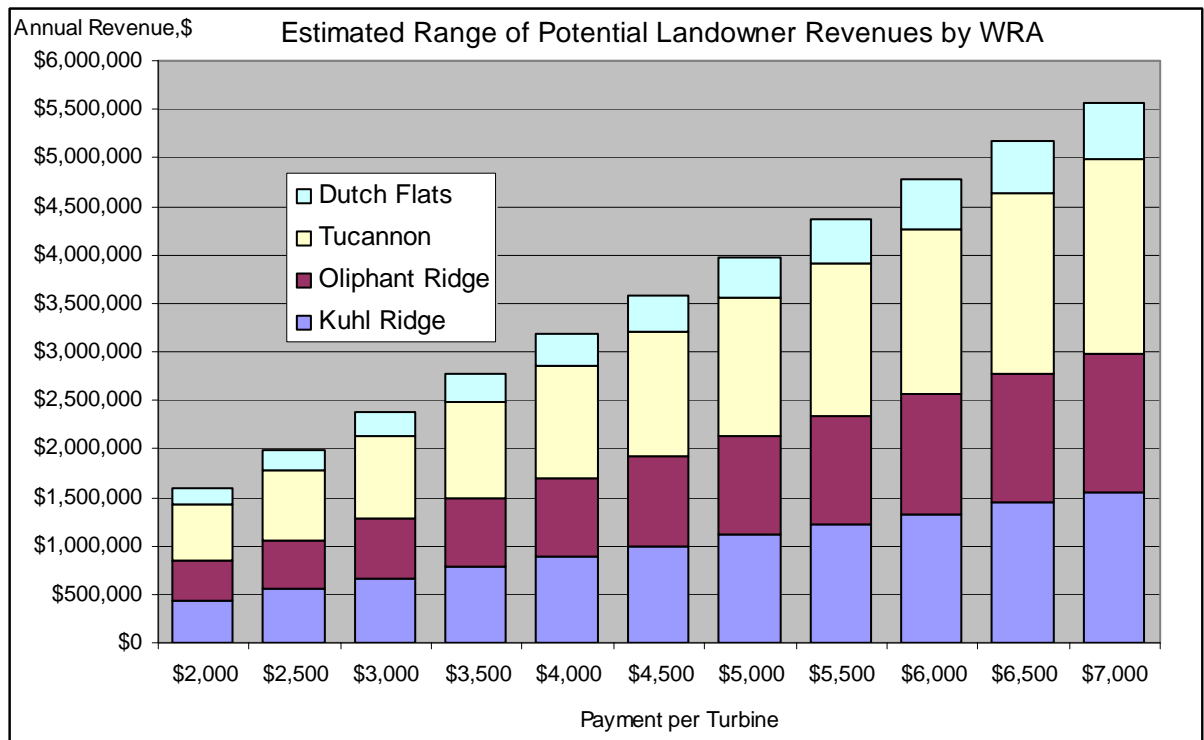
Wind turbines function as a source of supplemental revenue for landowners in rural areas. This supplemental income can be particularly meaningful in the context of wide fluctuations in agricultural incomes and can provide a stable, consistent source of income to offset declines in other land-based income sources.

Wind developers tend to lease land from landowners rather than purchase the land outright, although in some instances easements are purchased. Each lease contract with each developer can include unique and different terms and clauses and is usually negotiated on a separate individual basis with the landowner. However, some common terms, structures, and clauses are characteristic of these lease contracts (Entrix 2009).

Turbines and the associated infrastructure (foundations, roads, transmission lines, and so forth) have a combined footprint that can remove productive acreage on both a temporary and permanent basis. During the development and construction phases, landowners are generally compensated based on a dollar-per-acre lease agreement. Once the Project becomes operational, payments to landowners are usually made on a percentage of the gross revenues basis, or are paid based on the production of the wind project in dollars per megawatt generated (\$/MW). The landowner is typically still able to farm or allow grazing on all areas surrounding the turbines. Landowners who sell easements for wind energy projects typically receive a one-time, upfront payment (Entrix 2009).

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Publicly available data originally sourced from various projects shows that landowner lease payments can vary between the equivalent of \$2,000 to \$7,000 per turbine per year (AWEA 2009). This range represents a national average. Using this range of payments per landowner per turbine per year, the total potential range of revenues for each WRA were calculated. The calculations were based on multiplying the annual payment per turbine per year by the total number of turbines within each WRA. The sum total of the payments per WRA are the total combined landowner revenues (as a range) for the entire Project. The range of potential landowner revenues would be contingent upon the final negotiated lease amount. The range of payments per each WRA does not correspond to any one particular landowner's property. The range of the total value of payments is intended to show the range in the total value that would potentially accrue to all landowners. The estimates should not be added together, but are meant to show how much total landowner revenue could vary for the entire Project. Figure 2-23 shows the estimated total annual revenues per WRA for the Project based on the WRA distribution of total turbines (795) and average payments per turbine per year varying between \$2,000 and \$7,000 per turbine per year (AWEA 2009).



**Figure 2-23 Estimated Range of Potential Landowner Revenues by WRA**

Figure 2-23 shows that total landowner revenues can reach up \$5.6 million per annum at a lease payment equivalent to \$7,000 per turbine.

The landowner revenues from leases can offset volatile agricultural-land-based income and will also have an annual economic impact on Garfield and Columbia



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counties and the surrounding region. A large portion of these annual revenues will be spent on both discretionary and necessary purchases and the remainder will be saved and invested or used to pay taxes. It is likely that up to 70% of the annual revenues will be recycled and spent within the regional economy and will also generate annually recurring positive multiplicative impacts. Table 2-59 shows approximate estimates for these total economic impacts on total output in the region using the regional multiplier from the IMPLAN economic input-output model.

**Table 2-59 Annual Economic Impact from  
Landowner Revenues**

	Industrial Output	
	Low	High
Direct	\$1,113,000	\$3,895,500
Indirect	\$302,144	\$1,057,505
Induced	\$282,263	\$987,920
Total	\$1,697,407	\$5,940,924

### Property Values

A literature review was conducted of recent studies that tested whether wind farms in rural areas have had a negative impact on property values. The studies were selected for review based on applying reasonable qualifying criteria. The peer-reviewed studies concluded that wind farms have not had a negative impact on long-term property values. The studies are summarized in Appendix H.

### Agricultural Impacts

This section discusses potential agricultural impacts during construction and operations together. The Project footprint will displace a relatively small amount of acreage used for growing wheat and other crops. The displacement of these acres will have a minor impact by reducing agricultural income to each county. During the construction phase this impact will be temporary, and during facility operations the loss of these acres will be permanent, lasting for the 25-year useful life of the Project. The Entrix report also measured the “opportunity cost” of the wind farm footprints for Columbia County projects (Entrix 2009). This section applies Project preliminary data to potentially displaced acres, and actual county data on wheat yields and market values in a similar manner to estimate these likely impacts associated with the Project footprint.

Wind project developers apply stewardship practices to mitigate construction-related agricultural impacts. During the construction phase, landowners receive a one-time payment called an installation fee. This fee is intended to cover all damage to agricultural crops and grazing lands associated with installation of WTGs. In addition, the project developers are required to restore all lands temporarily impacted by construction to their original use. Landowners without WTGS are compensated for the actual crop damage associated with roads,

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transmission lines, and so forth. All landowners are compensated for the loss of or damage to agricultural crops and all temporarily disturbed areas are restored by the developer upon completion of construction (Hughes pers com 2009).

Table 2-60 shows data used to assess impacts to this resource. The table shows the total Project footprint acreage by WRA that will be impacted during construction and operation. Since wheat and row crops are the dominant crops and highly valued uses of agricultural lands, the opportunity cost of the wind farm's land footprint during both construction and operations (in dollar terms) was estimated by measuring market values for these crops.

**Table 2-60 Agricultural Impacts of the Lower Snake River Wind Energy Project**

		Wind Resource Area				Total
		Kuhl Ridge	Oliphant Ridge	Tucannon	Dutch Flats	
<b>Estimated Impacted Agricultural Acreage<sup>1</sup></b>						
<b>1</b>	<b>Construction (temporary)</b>					
2	Total acres	191.2	264.6	305.8	131.3	892.8
<b>3</b>	<b>Operations (permanent)</b>					
4	Total acres	194.0	271.6	240.9	130.5	837.0
<b>Estimated Market Value Associated with Footprint Impacted Acres (\$)</b>						
<b>5</b>	<b>Construction (temporary)</b>					
6	Total	76,398	97,924	122,159	52,457	348,937
<b>7</b>	<b>Operations (permanent)</b>					
8	Total:	77,526	102,512	96,260	52,140	328,437
9	PV @ 5%, n =25	1,092,653	1,444,793	1,356,678	734,856	4,628,980
10	Annual operational market value as a percentage of total market value for Columbia + Garfield Agricultural Production <sup>2</sup>	0.12%	0.15%	0.15%	0.08%	0.50%

Notes:

PV = present value

<sup>1</sup> The acreages listed in this table were estimated based on conservative assumptions that may not correlate with actual impacts associated with the footprint of the Project.

<sup>2</sup> Ratio reflects row 20 divided by [\$26.4 + \$39.82 million].

The table shows the estimated market values for these impacted acres during construction and operation. To estimate the market values for wheat, a recent market price of \$6/bu was used. The yield per acre applied was the average bushels per harvested acre or 66.6 bu/ac, which was equivalent to an approximate gross market value of \$400 per harvested acre. Row crop market values were estimated using a price of \$106.5 per acre.

Since only a partial or limited number of CRP acre enrollments are known at this time, they are not reported. The location of some of the known CRP lands was

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obtained from the USGS 2003 land cover dataset and may not represent the total acreage of CRP lands within the Project (see Land Use section). The Farm Service Agency was contacted for CRP data within the Project area; however, because the Food, Conservation, and Energy Act of 2008 prohibits disclosure of the information requested, it was unavailable for inclusion. Accordingly, no CRP acreage has been reported in the above table.

However, there is no adjustment made to the annual CRP lease payments corresponding to the CRP enrollee's contract for land that would host the wind turbine footprint. The CRP enrollee's annual payments, despite a potential reduction in CRP acres, will not be affected (Hamilton 2009). Appendix H shows the average payments per farm for operators enrolled in this program varied between \$18 thousand and \$20 thousand per farm for Garfield and Columbia counties. However, there will be no financial impact to CRP enrollees.

The total cumulative values associated with the footprint acres need to be placed in the context of an estimated \$79-million market value for wheat production in Columbia and Garfield for 2008. The construction period (temporary) estimated footprint value would be equivalent to 0.4% of the total value of this production if in fact all of these footprint acres were used in wheat production. Row 10 of the table shows the ratio of the annual estimated market value of the displaced acreage during facility operations to the total market value of combined agricultural production for Garfield and Columbia counties in 2007. This ratio shows that the agricultural market impact would be minor on a permanent or long-term basis. Row 9 shows the cumulative present value of 25 years' worth of annual production for the operational footprint, applying \$400 per acre. The present value of this production using a 5% discount rate would be equivalent to \$4.6 million over the useful life of the Project. The market value impacts are all expressed on a gross basis and do not reflect the netting out of operational costs of production.

### ***Wind Farm Income Offsets to Agricultural Impacts (per acre comparison)***

Over the long term, the loss of productive agricultural acreage and the resulting income will be offset by the landowner lease payments received per footprint acre. These payments per acre will compensate the landowner for the loss of productive acreage. A calculation of landowner revenues per WRA using average payments per turbine (as a proxy) varying from between \$2,000 to \$7,000 per turbine showed that landowner revenues will vary between \$1.6 and \$5.6 million per year (for all WRAs combined). These amounts translate to between \$500 and \$1,800 per average footprint acre. These amounts show that landowner lease revenues from turbines will compensate for and more than offset the loss of any agricultural production associated with Project footprints. The comparisons show that income from wind expressed on a per acre basis will more than compensate for the potential agricultural impacts because the comparison was on a gross basis. Net farm income per acre is much lower after production and operational expenses are taken into account. Assuming even a lower band annual lease

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payment per acre, the wind farm income would more than compensate for any potential losses. Wheat prices would have to rise to record levels not seen in several years in order to make the opportunity cost of the land equivalent between wind and agricultural income.

The landowner lease revenue payments will also provide a stable supplementary source of income to offset the swings in average agricultural incomes.

### ***Aerial Applications***

Comments were received concerning the Project's potential to interfere with aerial applications of chemicals in support of agriculture. According to crop consultants in the Columbia County (Dayton area), it has been observed that aerial applicators continue to fly and work within the operating wind project areas. Generally, air applicators apply insecticides and herbicides prior to harvest. When crops are small, chemicals are usually applied by ground equipment. This is usually more timely, cost-efficient, and effective than aerial application. But when crops are tall, ground applications are difficult. Timing is critical when applying chemicals. Weather can be a big factor. It varies from year to year and affects the decision on the type of application to be used. Additional safety protocols are needed when the aerial applicators fly near the towers, but they are similar when flying near any structure or wires. Having more structures in an area could increase the risks to the applicator and decrease their efficiency. Aerial application of chemicals occurs at a height of less than 300 feet, which makes the application less effective than ground application. Standard ground application is usually 20 inches from ground level (Tornberg Pers. Comm. 2009).

### ***Conservation Reserve Program Impacts***

The CRP involves payment of a contractually stipulated amount (usually over a 10–15-year contract period) to a land owner who takes acres out of agricultural production and plants some kind of vegetative cover for conservation, environmental and land/soil enhancement purposes (Hamilton 2009).

CRP lands are present in the Project area within the Kuhl Ridge. The CRP, which is administered by the USDA Farm Service Agency (FSA), is a voluntary program for agricultural land owners. Owners of eligible agricultural land who enroll in the program receive annual rental payments and cost-share assistance in return for establishing a cover of resource-conserving vegetation on enrolled farmland for 10 to 15 years. The vegetative cover reduces stormwater runoff and sedimentation, thereby improving local water quality and retaining valuable agricultural soils (USDA Farm Service Agency 2007). There are 558 acres of land within the Kuhl Ridge WRA enrolled with the Soil CRP program (USGS 2003).<sup>4</sup>

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<sup>4</sup> The Farm Service Agency was contacted for CRP data within the Project area; however, because the Food, Conservation, and Energy Act of 2008 prohibits disclosure of the information requested, it was unavailable for inclusion.

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The USDA's FSA Handbook Agricultural Resource Conservation Program for State and County Offices states:

Commodity Credit Corporation (CCC) may authorize the installation of windmills, wind turbines, wind-monitoring towers, or other wind-powered generation equipment on CRP acreage on a case-by-case basis. CCC may approve up to 5.0 acres per contract of wind turbines on CRP acreage provided the environmental impacts have been considered according to subparagraph 242 F. For authority over 5 acres, CCC shall submit a request in writing to the Conservation and Environmental Programs Division (CEPD) through the State Office according to subparagraph 31 A. The 5.0-acre per contract threshold is a cumulative figure that is calculated by totaling the square footage of land area devoted to the footprint of the wind generating device and any firebreak installed around the footprint. Access roads, transformers, and other ancillary equipment will not be considered in calculating the 5.0-acre per contract threshold. (USDA 2008)

Under the program policy for wind turbines, CRP contracts that involve wind turbine lands will not have an economic impact on the contract holder. Even though a small amount of footprint acreage may be effectively taken out of the CRP contractually allotted acreage, there are no financial impacts to the CRP enrollee. The statutory policy rationale recognized that wind farm development would take place on CRP and non-productive lands, and that the CRP program should not act to deter wind power development. Accordingly, the lease would not be terminated or renegotiated and the contractual payments would not be reduced ratably. As long as environmental impacts have been considered (according to subparagraph 242 F) the contract will not be terminated or the payments lowered. If the land area is larger than the above 5.0 acres per contract of wind turbines, the land owner may petition the FSA for a variance and can still receive the incumbent annual payment benefits of the existing contract under this policy (Hamilton 2009).

The Washington State FSA Office suggests CRP landowners contact the FSA to clarify the above policies when approached by wind farm developers (Hamilton 2009).

### **Recreation and Tourism**

The potential impacts to recreation and tourism were evaluated in the March 2009 report entitled, "Economic Impacts of Wind Energy Projects in Southeastern Washington" (Entrix 2009). This report provided an overview of the existing recreational and tourism resources available and the various programs related to hunting that have been implemented by the sponsors. The Entrix analysis was based on interviews, data collection, and analysis of post-construction trends in recreation and tourism in Columbia County as well as other studies.

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### ***Tourism***

The research found that a large number of tourists traveled along U.S. Route 12 and stopped in Dayton. The existing wind farms are visible to tourists and scenic drivers on Route 12 just east and west of town. There was no evidence suggesting the projects have discouraged tourists from traveling that route, although there was some evidence that the wind turbines have attracted new tourists as many people are curious about renewable energy systems and are interested in viewing wind turbines.

Not all wind farms are designed with dedicated renewable educational and informational facilities to host tourist groups, as this is not the wind farm’s principal function. However, where these facilities do exist they can contribute to drawing tourists to the wind farm, although some curious groups travel to farms without these dedicated facilities. Research shows that wind energy has attracted tourism at other locations where tourist facilities are available. For example, the PSE Wild Horse Renewable Energy Center near Ellensburg, Washington, hosted over 18,000 visitors for eight months of operation in 2008. The Dayton Chamber of Commerce has begun marketing the area using themes of wind energy projects and alternative energy. Furthermore, PSE operates free tours of the Hopkins Ridge Project. Visitors interested in viewing the operation can schedule tours through the Dayton office of PSE. Tours have been provided to visitors passing through Dayton and numerous organized groups including classes from local schools and colleges, class reunions, church groups, and senior citizen groups. While most visitors have come from Washington State, visitors have come from as far away as New Hampshire, Hawaii, New York, Virginia, Arizona, Montana, and Florida. PSE is promoting the package that visitors who come for a project tour continue on for lunch at a local restaurant. The Weinhard Hotel in Dayton has partnered with PSE to market a wine and wind tour as a tourist attraction. PacifiCorp anticipates starting a similar program at its Marengo I and II facilities (Entrix 2009). Table 2-61 shows data provided by PSE on the annual number of tourists visiting the Hopkins Ridge Wind Farm.

**Table 2-61 Visitors to Hopkins Ridge Wind Farm**

Year	Annual, No.	Cumulative (from 9/05)
2005 (Sept–Dec)	224	224
2006 (Jan–Dec)	701	925
2007 (Jan–Dec)	612	1,537
2008 (Jan–Dec)	713	2,250
2009 (Jan–Apr)	114	2,364

Source: PSE

Entrix 2009 also reviewed a number of other wind farm studies that attempted to measure the effects that wind energy developments have had on recreational use and tourism, including one study from Scotland that surveyed visitors on the effects of large-scale commercial wind farms. The studies suggested a weak link

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between recreation and wind farm developments, and some even indicate that wind developments can potentially increase tourism.

### ***Hunting***

A portion of the public and private lands leased by PSE and PacifiCorp for the Hopkins Ridge and Marengo projects were formerly available for hunting through a state-managed “Feel-Free-to-Hunt” Program (Program) in which private land owners allowed hunting access in return for state assistance in planning or implementing practices for enhancing wildlife habitat. The Program posts signs on properties that define the boundaries and establish safety zones in which no shooting is allowed. The state also provides extra enforcement against violations. Often, once wind farm construction begins, the entire leased project area is closed to the public due to theft and liability concerns. However, closing access to large tracts of hunting areas can cause unanticipated problems for lease-holding farmers. Without regulated hunting in these areas, wildlife populations can increase, potentially damaging crops. Additionally, if area access is prohibited, poachers and other violators can find refuge from enforcement agencies. Both PacifiCorp and PSE have hunting programs to allow access to the wind project lands. The PacifiCorp program was implemented just before the 2008 hunting season, and therefore little information was available on the program at the time of analysis. More information is available on the PSE program at Hopkins Ridge, which has been implemented since 2006. Prior to wind project construction at Hopkins Ridge, approximately 7,000 acres of the 11,500-acre project area were available for hunting through the state-managed Program. During the construction phase the entire project area was closed to the public (Entrix 2009).

In 2006, PSE began the “Access-With-Written-Permission” program (AWWP) for the Hopkins project area. Under the AWWP program the number of acres available for hunting increased to approximately 8,000 acres, a net gain of 1,000 acres. In the first year, PSE granted 838 permits to hunters and fishermen from five different states. In 2007 that number increased to 876 permits. Over 600 permits had already been granted for 2008 by late July and many more were expected. The permitting process is free and involves providing photo identification, a vehicle description including license plate number, and a fishing and/or hunting license number. Once the appropriate paperwork has been filed and the applicant has watched a 3-minute video provided by PSE outlining safety in the wind farm area, access is granted. Permit holders are given a map of the available hunting areas and the permit is valid until March 31st the following year. Hunters primarily seek elk, deer, and upland game birds in the project areas and fishermen primarily seek steelhead. There have been no reported violations of the AWWP program (Entrix 2009).

In summary, the data from the Program and the Hopkins Ridge AWWP program suggest that individuals are continuing to access the hunting lands in the controlled access Hopkins Ridge project areas. Due to this program and the expected implementation of similar programs in the Marengo projects, as well as

the availability of alternative hunting lands elsewhere in the vicinity, it is expected that the Project's impacts on hunting recreation in the area will be limited.

### **Property Taxes**

Wind farms in rural parts of Washington State have contributed significant portions to the host county assessed values through their tax bases. For instance, in Columbia County, which hosts the Hopkins Ridge and the Marengo projects, the assessed value of wind farms was \$69.5 million or 17.8% of the total assessed value of \$389.9 million in 2007. In 2008, wind farm assessed value was 23% of Columbia County's total assessed value, and these assets are estimated to rise to almost 35% of the property tax base in 2009. It is clear that wind farms have made substantial contributions as new sources of annual property tax revenue to their host communities. Property taxes are ad valorem taxes, meaning that the annual taxes paid reflect both the personal property and real property components of the wind farm's assessed value. In this document property taxes are synonymous with ad valorem taxes.

The contributions from wind farms have a positive impact on county and municipal services and taxpayers within these communities because they provide new resources and lower effective tax burdens. Not only do wind farms bring in new sources of annually recurring revenues, but they also result in lower effective taxes for other taxpayers who contribute to the tax base. The so called "redistributive effect" is very much alive and visible. For example, in Columbia County, tax rates or mill rates (per \$1,000 of assessed valuation) were reduced across all tax code areas, thus lowering the tax burdens for other taxpayers on the tax roll (Miller 2009).

Under Washington State property tax policies, each year's taxing district budget may be increased by no more than 1% (unless the public votes for a larger increase) plus the amount of assessed value allowed for new construction and the increases sanctioned under state-assessed utility valuation. While the assessed values may increase annually, the levy can increase by only 1% (based on annual assessments) and millage rates (rate per thousand of assessed valuation) are downward-adjusted accordingly to comply with this policy (Olson 2009). With the installation of wind farm assets and increases in assessed values, the net result (consistent with the levy lid policy) has been a progressive across-the-board reduction in mill (tax) rates in communities such as Columbia County, as new assessed values are added to the tax rolls.

Since the Project would cross two counties, the utility central assessment method is applied by the State of Washington's Department of Revenue to determine the taxable assessed value of the assets. The Department of Revenue uses an apportionment method that takes into account the utility's entire operations



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throughout the state. According to WAC 458-50-100,<sup>5</sup> “In general, the Department shall apportion the value of all public utility companies to the various counties in such a manner as will reasonably reflect the true cash value of the operating property located within each county and taxing district. Since it is impossible to determine with mathematical precision the precise value of each item of property located within each county and taxing district, the department shall apportion the value of operating property on the following basis;... (5) Electric light and power companies – The ratio that cost (historical or original) of operating property situated within each county and taxing district bears to the total cost (historical or original) of all operating property within the state as of January 1 of the assessment year...” (DOR 2009).

The following tables provide order of magnitude annual property tax estimates for Columbia and Garfield counties. The estimates are based on approximate estimates with information known at this time. To locate the applicable local tax districts within each county, tax maps from the Washington Department of Revenue were superimposed on the Project footprint GIS maps. This analysis enabled a count of the turbines within each tax district. The turbine counts were used to allocate the total estimated Project value within each tax district per county.

Historical annual tax payments associated with other wind farm assets installed throughout Washington were also used as a reference. These latter data were used to test whether the estimated tax payments were within realistic ranges given the size of the Project (the No. of turbines and MW) and the estimated asset values. For example, based on annual tax payments for the listed projects shown in Table 2-54, the average annual property tax payment per MW of installed capacity was \$5,742, while the average annual property tax payment per turbine was \$10,105. These figures were used to check the reasonableness of the estimates presented below.

### *Columbia County Estimates*

The tax estimates for Columbia County were also vetted with Ms. Christine Miller, the County Assessor, who has had experience with the taxation of wind farms and their integration within the tax rolls for the Hopkins Ridge and Marengo projects.

Table 2-62 shows the estimated annual ad valorem taxes associated with the Project component to be installed in Columbia County. The estimates assumed that 351 out of the 795 Project total turbines will be installed in Columbia County. The estimates also assumed that over a five-year construction period, an equal amount of capacity (MW) would be installed each year. The hypothetical five-year construction period is for working discussion purposes and is used as a

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<sup>5</sup> See <http://apps.leg.wa.gov/WAC/default.aspx?cite=458-50-100>

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parameter to complete the impact assessment analysis. For the first year, the tax estimates assume that 70 turbines (= 1/5 x 351 = 126 MW of capacity) would represent the completed construction or project value within the county.

**Table 2-62 Columbia County Annual Property Tax Estimates**

Recipient of Funds	Estimated Project Value in District	Levy rate/1000	Steady State Taxes (at full buildout)	Estimated Year 1 Taxes
County Current Expenses	\$512,115,623	1.32880	\$680,497	\$136,099
Road District 1	\$512,115,623	1.49103	\$763,580	\$152,716
Fire District 1	\$180,687,968	0.95204	\$172,021	\$34,404
Fire District 2	\$27,951,730	0.92500	\$25,855	\$5,171
Fire District 3	\$303,475,925	0.65590	\$199,051	\$39,810
Hospital District COLUMBIA	\$512,115,623	0.49995	\$256,033	\$51,207
Library RL	\$512,115,623	0.34419	\$176,267	\$35,253
Port COLUMBIA	\$512,115,623	0.33220	\$170,123	\$34,025
School 100				
#100 M&O-Waitsburg	\$29,948,282	1.39579	\$41,801	\$8,360
#100 Bond-Waitsburg	\$29,948,282	1.15696	\$34,649	\$6,930
School 2				
#2 Dayton M&O	\$376,350,077	1.07957	\$406,294	\$81,259
#2 Capital Tech Bond	\$376,350,077	0.05685	\$21,395	\$4,279
School 35				
#35/37 Pres/Star M&O	\$91,841,398	0.07098	\$6,519	\$1,304
#35/37 Pres/Star Bond	\$91,841,398	0.05256	\$4,827	\$965
School 44				
#44 Bond-Garfield	\$13,975,865	0.01163	\$163	\$33
#44 M&O-Garfield	\$13,975,865	0.02144	\$300	\$60
<b>County Total:</b>			<b>\$2,959,375</b>	<b>\$591,875</b>
<b>Applicable State Levies</b>				
#2 General	\$463,457,212	1.90000	\$880,569	\$176,114
#35 General	\$24,329,714	1.90000	\$46,226	\$9,245
#35/37-1 General	\$1,102,897	1.90000	\$2,096	\$419
#37 General	\$2,125,632	1.90000	\$4,039	\$808
#44 General	\$114,503	1.90000	\$218	\$44
#100 General	\$20,985,665	1.90000	\$39,873	\$7,975
<b>State Total:</b>	<b>\$512,115,623</b>		<b>\$973,020</b>	<b>\$194,604</b>
<b>Applicable Local Voted Levies</b>				
Hospital Bond Joint	\$512,115,623	0.35785	\$183,263	\$36,653
<b>Grand Total:</b>			<b>\$4,115,658</b>	<b>\$823,132</b>

It is estimated that annual property tax payments to Columbia County will be in the vicinity of \$0.8 million for the first year and rise to close to \$4 million per year upon full buildout and integration of the entire Project to the tax rolls. The mill rates shown (per \$1,000 of assessed valuation) reflect lower rates that have been downward-adjusted based on the applicable tax policies (i.e. the levy lid) and budget-based policies for Washington State and Columbia County.

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### *Garfield County Estimates*

Table 2-63 shows the estimated annual ad valorem taxes associated with the Project component to be installed in Garfield County. The estimates assumed that 444 out of the 795 Project total turbines will be installed in Garfield County. The estimates also assumed that over a five-year construction period, an equal amount of capacity (MW) would be installed each year. So for the first year, the tax estimates assume that 89 turbines ( $= 1/5 \times 444 = 160$  MW of capacity) would represent the completed construction or project value within the county.

**Table 2-63 Garfield County Annual Property Tax Estimates**

District	Estimated Total Assessed Value in District	Steady State Taxes (at full buildout)		
		Levy Rate/1000	Estimated Year 1 Taxes	
State Property Tax	\$647,804,377	1.8127044	\$1,174,278	\$234,856
County	\$647,804,377	0.9580142	\$620,606	\$124,121
Road District #1	\$647,804,377	1.3036498	\$844,510	\$168,902
Hospital District-Reg.	\$647,804,377	0.2984802	\$193,357	\$38,671
Hospital District-Special	\$647,804,377	0.7481056	\$484,626	\$96,925
Fire District	\$647,804,377	0.6148560	\$398,306	\$79,661
Port Garfield	\$647,804,377	0.2650277	\$171,686	\$34,337
School District 110-M&O	\$647,804,377	0.6149397	\$398,361	\$79,672
School District 110-Bond	\$647,804,377	0.3353043	\$217,212	\$43,442
<b>Grand Total:</b>			<b>\$4,502,941</b>	<b>\$900,588</b>

It is estimated that annual property tax payments to Garfield County will be in the vicinity of \$0.9 million for the first year and rise to close to \$4.5 million per year upon full buildout and integration of the entire Project to the tax rolls. The mill rates shown (per \$1,000 of assessed valuation) reflect lower rates that have been downward-adjusted based on the applicable tax policies (i.e. the levy lid) and budget-based policies for Washington State and Garfield County.

### *School District Funding and Equalization and Public School Impacts*

In Columbia County, the local school district and M&O (maintenance and operational budget amount) and any bond levies are distributed monthly from the funds collected at the county level. In terms of state funds for schools that are allocated based on the equalization principle, the money received is based on the county's assessed value, and usually varies inversely with these values (i.e., the greater the assessed value the less money the school districts receive from the state equalization payment; Miller 2009).

Stakeholders have noted that with the installation of wind farm assets in so-called "property poor" counties, there is the potential for a short-term financial impact to local school districts from state transfers that are based on equalization formulas (Spacek 2009). As the commercial or non-residential value of the tax base expands over time with the installation of the wind farm assets, it is expected that

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equalization formulas tied to old (lower) assessed valuations per pupil will change. For capital construction, state assistance varies with the amount of assessed valuation for property tax purposes in each school district. The more wealth (property value) per pupil the district has, the lower the percentage of state assistance. Accordingly, the state transfers can be expected to fall in the short term but be offset over the longer term by the new expanded tax payments that will flow to the school districts from the locally generated revenue contributions of the wind farm assets put in place.

Local school district funding is expected to be impacted because the new wind farm assets can change the school district levy equalization amount by reducing the percentage of funds transferred from the state, so in the short term the school district's share of equalized revenues can be reduced. However, observers have noted that over the longer-term horizon, upon completion of the projects, there is a positive impact from the expanded tax rolls and increases in annual tax payments with reduced levy rates. In other words, the wind farm property enables school district budgets to be met by locally generated non-residential portions of the new expanded tax base. In addition, since wind farms have generated employment, school district pupil enrollments have stabilized or increased, which can also help local school district financing and the flow of funds because state apportionment formulas are based on enrollments. It is possible that during the construction period, school aged children could potentially move to the area and enroll in local school districts. Based on past projects, the enrollment associated with construction was minimal and did not cause an impact on the school district. During operations it is estimated that 45 school aged children will become permanent residents and will enroll in area public schools. Over the long term, a wind farm's expansion of the non-residential tax base allows a community to be less dependent on equalization-based transfers from the state because locally derived tax revenues compensate for transfers (Mosio 2009).

Table 2-64 shows the historical school district funds per fiscal year for the Dayton School District in Columbia County. The table also shows the wind farm projects and dates (year online) for comparison at the top of the appropriate year column.

While Dayton has experienced a trend of declining pupil enrollment, revenues and expenditures per pupil have increased over the years. The share of total revenues coming from the State General Purpose Apportionment Fund fell between fiscal years 2003/2004 and 2007/2008 (from 53% to 50%). However, this portion of revenue was more than offset by the share of revenues coming from local taxes (rising from 14.5% to 16%) and the State Special Purpose Fund that rose from 14% to 19% of the total revenues over this period. Per pupil revenues and expenditure amounts have all increased over the years.

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**Table 2-64 General Fund Revenues and Other Financing Sources for the Dayton School District by Percent and Per Pupil**

	Marengo I&II (2007, 2008)			Hopkins Ridge (2005)	
	Fiscal Years				
	2007–2008	2006–2007	2005–2006	2004–2005	2003–2004
Dayton Enrollment, FTE	480.4	509.5	531.6	541.22	587.6
Total Revenues	\$5,405,475	\$5,311,450	\$5,118,179	\$5,026,879	\$5,179,822
Total Revenues per pupil	\$11,252	\$10,425	\$9,629	\$9,288	\$8,816
Total Expenditures	\$5,454,181	\$5,168,695	\$5,156,143	\$5,208,187	\$5,197,108
Total Expenditures per pupil	\$11,354	\$10,145	\$9,700	\$9,623	\$8,845
<b>Revenue Breakdown (Percent and Per Pupil)</b>					
Local taxes percent	15.9%	15.3%	14.8%	15.2%	14.5%
\$/pupil	\$1,787	\$1,597	\$1,421	\$1,409	\$1,277
Local support non-tax percent	3.5%	3.6%	3.9%	3.0%	2.7%
\$/pupil	\$399.0	\$375.4	\$379.7	\$275.9	\$240.0
State general purpose apportionment, percent	50.3%	51.8%	52.0%	53.1%	52.6%
\$/pupil	\$5,655	\$5,395	\$5,007	\$4,934	\$4,639
State Special Purpose, percent	18.8%	17.0%	16.3%	15.7%	13.9%
\$/pupil	\$2,112	\$1,771	\$1,569	\$1,460	\$1,223
Federal General Purpose, percent	3.3%	3.5%	3.6%	3.6%	3.4%
\$/pupil	\$371	\$360	\$343	\$330	\$302
Federal Special Purpose, percent	8.1%	8.7%	9.3%	8.8%	10.0%
\$/pupil	\$911.5	\$910.8	\$898.0	\$818.0	\$882.3
Other Financing Sources, percent	0.2%	0.1%	0.1%	0.7%	2.9%
\$/pupil	\$18	\$15	\$11	\$61	\$252

Source: OSPI 2009

The Project is likely to have a net beneficial impact on public schools. Based on the large scale of the proposed Project, with a multi-year construction period, it is possible that a portion of the construction workers who decide to relocate to the region will bring their families and dependents into the area, thereby possibly raising public school enrollments. During facility operations, enrollment may increase by up to 45 pupils from permanent employees and their dependents. These pupil enrollments would be a positive impact in light of the declining trend in pupil enrollments. School district revenues derived from the locally generated annual property tax payments are expected to increase. Data from Columbia County show that wind energy developers have contributed a growing proportion of the total amounts collected for the School 2 M&O taxing district. In 2007, developers paid 20.5% of the total dollars collected, and this ratio is expected to rise to 39% in 2009 (Miller 2009).

As with all taxable new construction projects, wind projects have tax revenues which do not become affective until 18 months after completion of construction. This results in a lag between the time the project becomes operational and the time tax revenues are realized at the level of the taxing district. This may result in

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a lag between the time any new enrollees attend local school districts and when the local school receives apportionment funds.

### ***Public Services & Fiscal Impacts***

The expected Project-related demands (per Project phase and by WRA) on public services are described in detail in Section 2.12 Public Services and Utilities.

Given the history of projects in the state it is likely that Project assets will generate annual tax revenues that will more than offset annual incremental municipal expenditures attributable to construction phase demands and facility operations. As Section 2.12 outlines, it is expected that there will be increased demands placed on roads, public schools and public safety. However, the increased ad valorem revenues anticipated will more than compensate for the increased demand related costs from the Project.

### ***Franchise Fees***

There are no franchise fees at either the state or local level beyond recompense to the county for review of the plans and inspection of installation of infrastructure in the county rights-of-way. This amount is considered de minimis. In Washington, counties may not assess fees in the guise of “franchise fees” beyond the actual costs incurred by the jurisdiction in relation to the granting and implementation of the franchise itself. Doing otherwise is generally viewed by the Washington courts as an unlawful tax (Anderson 2009).

### ***Insurance Costs***

Columbia County reported that the construction and operation of the Hopkins Ridge and Marengo facilities did not have any impact on the County’s insurance policy. Insurance premiums did not increase due to the presence of the wind farms (Richter 2009).

### ***End of Design Life Impacts***

The estimated design life of the major Project assets (the turbines, transformers, substations, and supporting infrastructure) is anticipated to be 25 years. Several options are available at the end of the Project’s design life. Among these are repowering with newer model turbines, decommissioning, and continuing to operate the plant if it is not fully depreciated and can function effectively. Decommissioning will be carried out in compliance with the requirements of the Garfield and Columbia County Zoning Ordinance and the conditions of approval in the CUPs issued by both counties.

If the Project is upgraded at the end of its useful life, there will be a positive economic impact to Garfield and Columbia counties. Construction/repowering workers will be needed to build and upgrade the plant, which will result in increased employment, incomes, and output to the region.

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Decommissioning would also involve mobilizing a demolition or dismantling workforce and would use specialized contractors, equipment, and personnel. These short-term non-recurrent activities would provide a one-time economic stimulus to the region. As materials are removed and dismantled, there are opportunities for salvaging and resource recovery as well as for beneficial reuse of equipment and infrastructure in other locations and potentially for other purposes.

However, decommissioning would result in a small reduction in permanent employment related to long-term O&M of the facilities. Unless these employees were deployed elsewhere in the state, there would be a net loss of long-term O&M wind energy jobs in Washington. Long-term permanent employment associated with the Project was estimated at 22 jobs. Decommissioning would also reduce the long-term ad valorem property taxes associated with the Project that would flow to Garfield and Columbia counties. While the land would still be taxed, the counties would lose the larger annually recurring tax revenues associated with the assessed value of the wind farm assets that reflect both real and personal property assessed values.

### ***Mitigation***

There appears to be sufficient temporary housing in the region to accommodate the temporary construction workforce during each phase of the construction. Reports from past projects show that some workgroups lease apartments in small groups, while others use hotels/motels and RV camping sites. The available housing units have been profiled in exhibits above. The incremental demand for housing during any one man month is unlikely to require mitigation or special measures. Reports from past projects relate that the placement of temporary roads in rural areas used for agricultural production requires careful consideration and planning. This planning for compatible land use is part of the landowner lease negotiation process and can be considered part of the sustainable project design and does not require separate mitigation.

Given the changes that the installation of wind farm assets can bring to county and school district finances, it is recommended that close coordination between project sponsors and developers and county and school district officials be maintained so that the county and school districts are aware of the likely dates of project phase completion and the assets are commissioned and become part of the tax rolls. If sufficient notice is provided, school districts can proactively budget to accommodate any future likely changes given notice of the dates when they would fall within the upcoming fiscal year.

#### **2.15.2.2 No Action Alternative**

Under the No Action Alternative the WRAs would not be exploited for their wind energy potential. The socioeconomic impacts described in this section would not occur. The WRA lands would continue to be used according to their existing uses,

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mainly agricultural. The loss of agricultural income from displaced production would not occur. However, the annual lease payments to landowners hosting wind turbines would also be foregone. Therefore, select landowners would forego a stable source of annually recurring income and the counties would lose annual property taxes that have the potential to lower the effective tax burden for other taxpayers. The gains to regional employment and income during the construction and operational phases would not be realized. Under the No Action alternative, the demand for electricity that would have been satisfied by the Project's nameplate 1,432 MW would have to be supplied from other generation sources. To the extent that other fossil fuel generation sources would provide the power, the No Action Alternative would result in greater air pollutant emissions, water consumption, and depletion of non-renewable fuel supplies used in the production of electricity to meet demand within the NEPP/WECC region.

### **2.15.2.3 Probable Significant and Unavoidable Adverse Impacts**

As mitigated, the Project will have no probable significant and unavoidable adverse impacts to socioeconomics.

### **2.15.2.4 Cumulative Impacts**

Cumulative impacts analysis considers the past, present, and reasonably foreseeable future actions (projects) that could have direct or indirect impacts in combination with the proposed action on socioeconomic resource areas.

As the Project develops and comes online it is likely that the host communities (Garfield and Columbia counties) will become more self-sufficient in financing public services. As the local property tax base grows and expands, the non-residential local portion of the tax base will comprise a greater share of the total assessed valuation. Table 2-60 shows that transfers (intergovernmental revenues) are at high proportions of total revenue requirements to fund county services for both Garfield and Columbia. It is likely that these transfers will fall as the local property tax base expands. The wind farm assets add to the overall tax base which will result in a lower effective tax rate on current voter approved levies and bonds, thus reducing the overall tax burden on individual taxpayers.

As the local tax base grows and broadens, the cumulative impact on school districts is also expected to be beneficial. Less reliance on state transfers will be required to fund expenditures at levels that meet state goals and national standard requirements.

Potential cumulative impacts exist related to a reduction in total farmable lands to be offset by non-farm income from wind farm landowner leases. The relative size of the total areas (combined acreage) in relation to permanent footprints results in a small loss of agricultural income. However, it is likely that this loss will be more than compensated for by stable, consistent sources of landowner revenues from wind energy leases.



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The cumulative impacts from the Project's annual renewable power output, estimated at 3.76 million MWh per year (steady state), will have a beneficial impact on the contributions to the Northwest Power Pool and the WECC region. Renewable, clean energy will contribute to less long-term reliance on fossil fuels and imports from outside the state and country. The Project's energy supply will have a beneficial cumulative impact on residential, industrial, and commercial end users. Electric power is necessary to sustain future economic growth and is a raw input to numerous productive and manufacturing processes. As regional and state renewable energy capacity increases, there is a beneficial cumulative impact in terms of energy security, independence, and diversification that the wind project assets collectively contribute to over the long term.

The power to be produced at the Project will be available for inclusion into the energy portfolio of PSE. PSE's portfolio reflects a diverse mix of generation assets including low-cost hydropower (approximately 42% of power supply mix; PSE 2009). The costs of the power from the Project will be blended into the total electricity generation costs of the utility. The blending of costs into a diversified supply portfolio will likely have a neutral impact on the cost of power to consumers (utility rate payers) within the region (Entrix 2009).

## **2.16 Health and Safety**

This section describes existing health and safety hazards at the Project site and identifies potential health and safety risks from Project construction and operation, including the risk of fire or explosion, potential for release of hazardous materials, vandalism, traffic accidents, turbine structural failure, ice throw, electric and magnetic fields, and shadow-flicker. Mitigation measures are identified for potential impacts.

### **2.16.1 Affected Environment**

Existing conditions and uses in the four WRAs include vehicular, mechanical, and electrical hazards associated with living, working, and traveling in a rural area.

The area's climate affects the potential for fire in summer and icing in the winter. See Sections 2.9 Climate and Air Quality and 2.13 Traffic and Transportation for additional information on climate and roadway conditions, respectively, for each WRA. See Section 2.14 Land Use and Recreation for detailed information on residences within each WRA. This information is summarized in Table 2-65.

#### Tucannon WRA

The Tucannon WRA consists of approximately 41,500 acres in Columbia County. The proposed Project site will include approximately 286 turbines. There are 14 residences within the Tucannon WRA, located along SR 12, Kellog Hollow Road, and McKay-Alto Road. The closest residence to a Project component, located within the south central portion of the Tucannon WRA, is about 1,300 feet from the nearest wind turbine site. All landowners in the WRA are participating landowners (i.e., landowners with a lease agreement with the Applicant).

#### Kuhl Ridge WRA

The Kuhl Ridge WRA consists of approximately 39,900 acres in Garfield County. The proposed Project site will include approximately 222 turbines. In the Kuhl Ridge WRA, there are 13 residences, primarily located along New York Gulch Road, SR 12, and Kuhl Ridge Road. The closest resident is about 700 feet from the nearest wind turbine site. All landowners in the WRA are participating landowners.

#### Dutch Flats WRA

The Dutch Flats WRA consists of approximately 10,000 acres of leased land in Garfield County. The proposed Project site will include approximately 83 turbines with 0.24 acres of overhead electrical transmission lines. In the Dutch Flats WRA, there are 9 residences, primarily along Peola Road. All landowners in the WRA are participating landowners.

#### Oliphant Ridge WRA

The Oliphant Ridge WRA consists of approximately 32,700 acres of leased land in Columbia and Garfield counties. The proposed Project site will include approximately 139 turbines in Garfield County and 65 turbines in Columbia

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County. In the Garfield County portion of the Oliphant WRA, there are 13 residences, located primarily along SR 12, Jackson Road, and West Oliphant Road. All landowners in the WRA are participating landowners except one, which is located in the southeastern corner of the WRA. No identified residences are located within the Columbia County portion of the Oliphant WRA.

**Table 2-65 Residences Located Within Each WRA**

WRA	Number of Residences
Tucannon	14
Kuhl Ridge	13
Dutch Flats	9
Oliphant Ridge	13

### **2.16.2 Impacts and Mitigation**

#### **2.16.2.1 Preferred Alternative**

This section describes the potential health and safety impacts from the Project. Impacts could be associated with construction and operations of the proposed Project elements, including the wind turbines and meteorological towers, existing and new roads, additional power lines, and the O&M facilities and substations. Impacts associated with or attributable to specific Project elements are discussed where applicable. Health and safety risks during construction include potential fire or explosion, spill potential of hazardous materials to the environment, vandalism, and risk of traffic accidents. Health and safety risks during Project operation include potential risk or explosion, spill potential of hazardous materials, risk to vandalism, as well as others specific to wind turbine generators such as structural failure, ice throw, electromagnetic fields, and shadow flicker. Unless otherwise indicated, the impacts are the same for all WRAs.

#### ***Construction Impacts***

##### All Four WRAs

#### **Fire/Explosion Risk**

As with any construction Project, there is a risk of unintentional or accidental fire or explosion. Natural risk of unintentional fire or explosion, such as from a lightning strike, for the proposed alternative is the same as the no action alternative. There is potential fire risk from human activities (ground disturbance leading to accidental fire or explosion, for example) for the proposed action.

Lightning-induced fires are rare in the Project area. Based on a flash density map of the area (NOAA 2006), interior Washington is not a highly lightning-prone area. The highest expected fire risks are grass fires during the hot, dry summer season. Fire sources associated with construction activities include dry vegetation coming in contact with hot exhaust catalytic converters under vehicles, smoking,

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use of explosives, electrical arcing, hot exhaust from portable generators, and use of welding torches.

### **Spill Potential**

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. However, this type of leak should not create a risk to health and safety or the environment because of the limited quantities of the materials involved. Small quantities of lubricating oils may also be stored in appropriate containers at the construction staging area. Diesel fuel is the primary potentially hazardous material that will be used in any significant quantity during Project construction. Project construction will require the use of diesel fuel for operating construction equipment and vehicles during high risk fire season.

### **Vandalism**

Vandalism of Project facilities and theft of equipment during construction is a potential area of concern. Construction materials will be stored at the individual turbine locations, or at the staging area around the perimeter of the operations and maintenance facility and site construction trailers.

The Tucannon and Oliphant WRAs are located in Columbia County. In 2007, the number of property crimes in Columbia County was 178. Seventy-eight percent of the property crimes were theft. The property crime rate (per 1,000) is 43.4. (The statewide rate is 40 per 1,000.) The Dutch Flats, Kuhl Ridge, and Oliphant WRAs are located in Garfield County. In 2007, the number of property crimes in Garfield County was 48. Seventy-seven percent of the property crimes were theft. The property crime rate (per 1,000) is 20.4 (Uniform Crime Report).

The Applicant's site project manager will work with a security contractor to develop a plan to effectively monitor the overall site during construction, including drive-around security and specific checkpoints. Based on the level of construction activity and amount of sensitive or vulnerable equipment in specific areas, site access will be monitored.

### **Traffic Accidents**

Conditions of existing roads, road hazards, accident rates, and standards for new roads are presented in Section 2.13 Traffic and Transportation. Expected increase in traffic and traffic accidents, in all WRAs is also presented in Section 2.13. Impacts to air traffic are also presented in Section 2.13. Impacts associated with traffic accidents are related to site access to emergency medical services. Location of and access to fire, emergency medical, and transportation services is provided in Section 2.12 Public Services and Utilities.

***Project Facility Impacts***All Four WRAs**Fire/Explosion Risk**

Unintentional fire or explosion during the Project operation and maintenance from both mechanical sources and human activities is unlikely but could occur. The Project HSP will incorporate fire safety planning consistent with the Applicant's standard operating procedures to ensure that fire safety planning is incorporated into the design, construction, and operation of all facilities. Impacts associated with these risks are related to site access to fire protection services. These services are discussed in Section 2.12.

The turbines include fire protection features that monitor bearing, oil, and nacelle temperatures. The turbine control system will monitor sensor temperatures and automatically shut the turbine down and send an alarm to the control room if predetermined set points are exceeded. In addition to the monitoring system, each turbine and each service vehicle will be equipped with a fire extinguisher.

As noted above, lightning-induced fires are rare in the Project area. Each turbine blade is equipped with a small conductor located at the tip of the blade. This sensor is connected to the grounding grid surrounding the turbine foundation. All lightning strikes will travel directly to the ground and will not affect the turbine or the surroundings.

**Spill Potential**

Project operations generate very small quantities of hazardous material. These wastes result from turbine maintenance activities and the source is primarily from unpunctured aerosol cans. Because no fuel is burned to power the wind turbine generators, there will be no spent fuel, ash, sludge or other process wastes generated. Project operations will not require the use or storage of significant quantities of fuel or other materials that could cause a spill or other accidental release. Potential impacts associated with specific Project facilities are described in more detail below.

*Wind Turbine Generators.* Periodic changing of lubricating oils, hydraulic fluids, and anti-freeze used in the individual wind turbine generators will result in the generation of small quantities of hazardous waste. These waste fluids will be generated in small quantities because they need to be changed infrequently and the changing of these fluids is not done all at once, but rather on an individual turbine-by-turbine basis. The potential for a large-scale accidental spill from a wind turbine malfunction is low because the quantities of fluid contained onboard are small and their storage is compartmentalized within each turbine.

*Electrical Collection System.* Power from the turbines will be fed through a breaker panel at the turbine base inside the tower and will be interconnected to a step-up transformer, which steps the voltage up to 34.5 kV. The transformer may

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contain mineral oil that acts as a coolant. If so, the turbine transformers will be filled at the factory. Some models of turbine transformers do not require mineral oil for cooling. The pad-mounted transformers at the base of the towers or located in the nacelles will be filled at the factory. The potential for an accidental spill from malfunction or breach of the transformers is low.

*Substations and Interconnection Facilities.* The Project will be electrically connected to the power grid at substations. Each substation transformer will contain mineral oil for cooling. Substation transformer requirements will be the same regardless of the size of turbine ultimately chosen. Mineral oil used to fill substation transformers is a potential source of hazardous materials that could accidentally be spilled during Project operations. The substation transformers will have a specifically designed containment system to ensure that any accidental fluid leak does not result in discharge to the environment.

*Operations and Maintenance Facilities.* Waste fluids will be stored for short periods of time during Project operations at the O&M facilities. Measures incorporated into the design of the O&M facilities will ensure that the risk of accidental spill or release of hazardous materials at the facility will be low and will not be a risk to health and safety or the environment.

### **Vandalism**

Risk of vandalism of Project facilities and theft of equipment during operation is similar to that expected during construction. The Project design will include site security measures to ensure that vandalism does not pose a health or safety threat to workers at the Project site or residents or visitors in the Project vicinity, nor adversely affect Project operations.

### **Turbine Structural Failure**

Structural failure is very rare and can be attributed to improper design, manufacturing defects, extreme weather events, or the wrong application of technology (Garrad Hassan Canada, Inc. 2007). Some instances of turbine failure have been documented in older turbine models. In those rare instances, where towers or blades have failed, the failure typically results in components crumpling or falling straight down to the ground, although in a small number of cases blades or parts of blades have been thrown from the nacelle.

The wind turbines for this Project will be equipped with sophisticated computer control systems to monitor variables such as wind speed and direction, air and machine temperatures, electrical voltages, currents, vibrations, blade pitch and yaw angles, etc. Each turbine will be connected to a central data control system. The system will allow for remote control and monitoring of individual turbines and the wind plant as a whole from both the central host computer or from a remote computer. All turbines are designed with several levels of built-in safety and comply with the codes set forth by Occupational Safety and Health Administration (OSHA) and American National Standards Institute (ANSI)

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standards. The turbines will be equipped with two fully independent braking systems that could stop the rotor either acting together or independently. The braking system is designed to bring the rotor to a halt under all foreseeable conditions. The system will include aerodynamic braking by the rotor blades and by a separate hydraulic disc brake system. Both braking systems will operate independently such that if there is a fault with one system, the other could still bring the turbine to a halt. Remote restarting of the turbine will not be possible following an emergency stop. The turbine will be inspected in-person and the stop-fault reset manually to re-activate automatic operation. The turbines will also be equipped with a parking brake used to “park” the rotor while maintenance routines or stationary rotor inspections are performed.

Members of the public do not typically have access to the lands on which the turbines are located and gates and signage will be used to discourage unauthorized access. Proper turbine selection, inspection, maintenance, and operation further reduce the risk to public safety. The potential for structural failure has been significantly reduced with the advancement of design utilized in modern turbines and through constant monitoring and automatic operational adjustments.

### **Ice-throw**

While ice-throw has emerged as a public concern associated with wind energy facility safety in cold weather climates, the proper siting and adherence to setback requirements and safety procedures minimize any potential risk to the public. Ice-throw is caused by the buildup of ice on the turbine’s blades and can occur under certain conditions. This generally takes place when a stationary blade accumulates ice followed by an increase in temperature which causes the ice on the rotor blades to thaw. If the blades are stationary, the ice will fall near the turbine base, but once the blades begin to rotate, ice fragments on the blade may be thrown under certain wind speeds and directions. When temperatures are below or just above freezing, the risk of ice buildup exists and can occur as result of two types of events, riming and freezing rain. The risk of impacts from ice throw is minimal. A 1998 study reported there had been no injury from ice thrown from wind turbines (Morgan et al. 1998). A 2009 study reported one human injury due to ice-throw, although the specifics of the incident were not provided (Caithness Windfarms Information Forum 2009).

Two main studies have looked at the potential impacts of ice throw. Morgan et al. (1998) reviewed reported data on ice throws and determined that ice fragments were found on the ground from 50 feet to 328 feet from turbines and were in the range of 0.2 pounds to 2.2 pounds in mass. When more than a few meters from the turbine, the risk of ice landing at a specific location was found to reduce quite quickly with the distance of the location from the turbine. It was also found that ice falls predominantly downwind of the rotor plane.

Seifert et al. (2003) conducted risk analyses on ice throw primarily in Europe. The general conclusion was that wind turbines should not cause risks as they are

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normally set back from residences and roadways and that the hypothetical risk of being struck by ice is small. A simplified empirical equation was introduced to represent the overall risk area for an operating turbine based on hub height and rotor diameter. However, the actual throwing distance of the ice fragments will vary based on many variables not included in this calculation, including rotor azimuth, rotor speed, local radius, ice fragment size and weight, and the wind speed.

The operations staff working in and around the turbines could be at risk of ice throw from the blades if they are beneath the blades when icing conditions exist.

### Electromagnetic Fields

Electric Magnetic Fields (EMF) from the Project will be lower than that of many common household appliances and will not have significant health and safety impacts.

Electrical transmission lines, distribution lines, and substations create EMF. EMF also exists in nature and around all types of electrical devices and appliances. Electric fields are produced by the presence of differences in electrical potential (voltage); and the movement of charges because of the potential (current). This movement produces magnetic fields. The electrical and magnetic fields around electrical appliances and utility facilities are referred to as extremely low frequency EMF. They have a significantly lower frequency (60 cycles per second, or Hz), than radio broadcast waves (0.5 to 100 million cycles per second) or electromagnetic energy from sunshine (1,000 trillion cycles per second).

As shown in the table below, much of typical daily exposure to EMF from human-made sources is a result of using electric home appliances. EMF strength is expressed with a unit of measure called a gauss (or milligauss), and is measured using a special monitoring device (see Table 2-66). The strength of EMF falls rapidly as one moves away from the source.

**Table 2-66 EMF Readings of Common Equipment**

Source	EMF reading in milligauss (mG)
Video Display Terminals (VDTs)(distance 6 inches)	14 mG
Portable Heaters (distance 6 inches)	100 mG
Vacuum Cleaner <sup>1</sup> (distance 6 inches)	300 mG
Can Opener <sup>1</sup> (distance 6 inches)	600 mG
Hair Dryer <sup>1</sup> (distance 6 inches)	300 mG
Distribution Line 37.5 kV <sup>2</sup> (distance 100 feet)	<1-2 mG
Transmission Line 115 kV <sup>1</sup> (distance 100 feet)	1.7 mG
Transmission Line 230 kV <sup>1</sup> (distance 100 feet)	7.1 mG

<sup>1</sup> Median reading in milligauss. National Institute of Environmental Health Sciences, EMF: Questions and Answers, 2002.

<sup>2</sup> Gauger, J.R., IEEE Transactions on Power Apparatus and Systems, PA-104, Sept., 1985; Silva, M. et al, IEEE/PES 1988 Winter Meeting, 88-WM-101-8



Some people have wondered whether EMF produced from the use of electricity might adversely affect human health. The consensus of the scientific community is described in a number of reports that have been released by respected independent scientific groups representing a variety of disciplines including physics, epidemiology, and cellular biology. A review of these sources has found no causal relationship between exposure to extremely low frequency EMF associated with 60 Hertz (Hz) electrical facilities and adverse effects to human health.

In 1999, after conducting the largest evaluation to date, the National Institute of Environmental Health Sciences found the scientific evidence for human health risk from EMF exposure weak (NIEHS 1999). Health Canada found in 2004 that there is no conclusive evidence of any harm caused by exposures at levels normally found in living and working environments (Health Canada 2004). Neither the EPA nor any other health agency of the state or federal government regulates electric and magnetic fields. This is consistent with the consensus of the scientific community that there is no basis from which to conclude the exposures to EMF cause adverse health effects.

### **Shadow Flicker**

Shadow flicker is the alternating changes in light intensity when moving turbine blades cast shadows on the ground and objects, such as windows in residences. Shadow flicker is not caused by viewing the sun through rotating wind turbine blades or moving through the shadows of a wind energy facility, or sunlight reflected from turbine blades. Shadow flicker occurs when a turbine is located near a receptor (e.g., residence) with an unobstructed line of sight to the turbine, the sun is behind and perpendicular to the turning turbine blades and the receptor is located close enough to the turbine to be in its shadow. The existence and intensity of shadow flicker are affected by a number of factors including the following:

- The strength of the sun as affected by cloud cover.
- The line of sight of the observer relative to the sun and the turbine. This is related to the sun's height in the sky, which varies with latitude and longitude, time of day, and time of year.
- The distance between the observer and the turbine, which affects the distinctness of the shadows.
- The presence of obstructions such as buildings or vegetation.
- The orientation of the turbine depending on wind conditions. When the turbine is facing the sun, shadow flicker is greater behind the turbine; when the turbine is rotating in line with the sun, there is much less flicker (CREB 2008).

Potential shadow flicker from wind turbines can only occur when (1) the sun is very low in the sky; (2) a receptor is very close to the turbine; (3) the receptor is

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oriented toward a turbine; (4) the receptor has an unobstructed line of sight; and (5) the weather conditions include bright sun. When all these factors exist, they may produce a pulsating shadow which may or may not be perceptible.

Shadow flicker frequency is related to the rotor speed and number of blades on the rotor, which can be translated into a “blade pass frequency” measured in alternations per second, or hertz (Hz). Although in some instances the flickering of light can induce epileptic seizures in people who are photosensitive (about 3-5% of the 1% of Americans who are epileptic are photosensitive), shadow flicker from wind turbines is too slow to induce epileptic seizures. Whether light flicker will provoke a reaction depends on its frequency, light intensity, visual area, image pattern, and color (Epilepsy Foundation 2009). Flicker frequency due to a turbine is on the order of the rotor frequency, i.e., 0.6-1.0 Hz (NRC/NAS 2007). The flicker frequency that provokes seizures in photosensitive individuals is 5-30 Hz, well above the maximum of approximately 1 Hz for wind turbines. In accord, there is no scientific data or peer-reviewed studies that suggest a link between epileptic seizures and rotor blade alternatives.

### **Other Health and Safety Issues**

There is no reliable evidence that sound from wind turbines presents a worker or community health or safety issue. A normal conversation can be held within close proximity of an operating turbine. A number of non-epidemiological reports have been published that describe complaints of annoyance and other health problems that the complainants correlate to the presence of wind turbines. However, such reports do not include randomly selected study subjects and appropriate controls or parameters for data collection in order demonstrate causal relations between sound level and complaints. Permissible noise levels are regulated by Washington Department of Ecology at WAC 173-60 (see Ch. 2.11, Noise). Sound pressure levels of representative sounds and noise are contained therein. Ecology’s regulatory standards applicable to the Project require it to operate at or below these levels. According to a peer-reviewed article in *Canadian Acoustics* “there is no reliable evidence that infrasound [frequencies below 20 Hz] at levels below its hearing threshold has an adverse effect on the body” and that “infrasound from wind turbines is below the audible threshold and of no consequence” (Leventhall, G. 2006).

### **End of Design Life Impacts**

#### **Fire/Explosion Risk**

The risk of fire and explosion during decommissioning will be similar to that during construction.

#### **Spill Potential**

The risk of release or potential release of hazardous materials during decommissioning will be similar to that during construction.

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### **Vandalism**

The risk of vandalism during decommissioning will be similar to that during construction.

### **Traffic Accidents**

The risk of traffic accidents during decommissioning will be similar to that during construction.

### **Mitigation**

The Applicant and its subcontractors will comply with all applicable local, state, and federal safety, health, and environmental laws, ordinances, regulations and standards. These issues will be provided in a Project HSP. An important mitigation measure for safety concerns is compliance with applicable setback requirements. Project components will be sited to comply with these requirements.

Access to emergency medical and fire services is important to mitigate any impacts from potential health and safety issues. Location of and access to fire, emergency medical, and transportation services is provided in Section 2.12. In general, the existing emergency response capabilities are adequate to provide any ambulatory, paramedic or fire response services that may be necessary during construction, operation, and decommissioning of the proposed Project. Fire District #3 could potentially need to purchase an additional water tender to meet response needs at the Project (Columbia County Planning Department 2009).

In addition to those mitigation measures already identified above, the following will be implemented to reduce the risks to health and safety.

### **Fire/Explosion Risk**

In addition to mechanical safety features, the Applicant will develop a site-specific ERP and Fire and Mitigation Plan. These plans will detail the actions to be taken by the site manager and staff should an emergency or fire occur and will be similar to Applicant's ERP and Fire and Mitigation Plan for the Hopkins Ridge II Wind Project (RES 2007a and b). The site-specific plans will be coordinated with the local fire departments and emergency response organizations and will set forth the lines of communication in the event of a fire or other emergency.

The Fire Mitigation Plan will identify measures to mitigate potential fire and explosion risks during Project construction, operation, and decommissioning. These measures will include, but not be limited to, issues provided in fire safety training of personnel, fire extinguishers in all vehicles, no gas-powered vehicles outside of graveled areas during high risk fire season, use of mainly diesel vehicles during high risk fire season, smoking restricted to designated areas, grounding systems on all turbines, all electrical design and construction

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specifications will meet or exceed National Electrical Code (NEC) and National Fire Protection Association (NFPA) standards.

A HSP will be developed prior to construction and will incorporate fire safety planning consistent with the Applicant's standard operating procedures to ensure that fire safety planning is incorporated into the construction of all facilities.

### **Spill Potential**

Implementation of appropriate spill prevention and control measures will ensure that the risk of an accidental release of hazardous materials remains low throughout construction and operation. During construction, the fuel trucks will be used for refueling construction vehicles and equipment onsite. To avoid spills, fueling trucks will be equipped with auto shutoff valves and other safety devices. The fuel trucks will be properly licensed and will incorporate features such as automatic shutoff devices, to prevent accidental spills. The oil truck used to fill substation transformers will be properly licensed and will incorporate several special features in equipment and operation, such as automatic shutoff devices, to prevent accidental spills. The details of how lubricating oils and other materials will be stored and contained at the construction staging area will be documented in a construction Spill Prevention, Control and Countermeasure (SPCC) Plan. This plan will show storage, detention, and response procedures for all potential chemicals used onsite. Implementation of appropriate spill prevention and control measures will ensure that the risk of an accidental release of hazardous materials remains low throughout construction.

Compliance with applicable federal, state, and local laws, ordinances, regulations, and standards will ensure that the risk of release does not create an adverse health and safety or environmental impact. Contractor personnel will be trained in spill prevention and control and, if an incident occurs, in containment and cleanup. Spills will be addressed in accordance with the SPCC Plan.

The Applicant is currently conducting a Phase I environmental Site Assessment (SA) for the Project site. The results of the Phase I environmental SA will reveal the presence or potential presence of any environmental contamination on the Project site. In the event that contaminated soil exceeding Washington State Department of Ecology (Ecology) cleanup levels is encountered during construction, the applicant will coordinate with Ecology to determine the measures to be taken.

### **Vandalism**

During construction the Applicant's site project manager will develop a security plan to effectively monitor the overall site. Based on the level of construction activity and amount of sensitive or vulnerable equipment in specific areas, site access will be controlled. Construction materials will be stored at the individual turbine locations, or at the staging area around the perimeter of the operations and maintenance facility and site construction trailers.

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A site security plan will be put in place to limit access and potential for vandalism and theft during operation. Security measures will be similar to those identified for the construction phase.

### **Traffic Accidents**

See Section 2.13 Traffic and Transportation regarding mitigation of traffic accidents.

### **Turbine Structural Failure**

The Applicant will comply with all protective setbacks from residences, property lines, and roads will be incorporated into the Project to provide additional protection in the unlikely event of a structural failure. Facilities will be designed so that all turbine locations meet or exceed applicable setback requirements. The Project will be sited to meet the setback requirements provided in Section 1.5.3.7.

The Applicant will submit a statement by a professional engineer certifying that the rotor and overspeed controls have been designed and fabricated for the proposed use in accordance with good engineering practice.

The wind turbines will meet international design and manufacturing safety standard for tower, blade, and generator design. Quality Assurance/Quality Control (QA/QC) inspections of the wind turbine generators and towers will typically include, but not be limited to, inspection of turbines at manufacturer's facilities; review and inspection of manufacturer's QA/QC procedures; manufacturing drawing review and verification; verification of welding procedure specifications compliance; overall visual inspection; witness or review of turbine load testing; inspection of paint finishing and protection; inspection of painting/marketing/preparation for shipment; verification of field wiring and tagging; and pre-commissioning field testing and verification.

### **Ice-throw**

Potential impacts at the Project site associated with the risk from ice throw will be minimized through adherence to setback requirements and an on-site HSP. Manufacture's recommendations regarding operation during icing conditions will be followed and will include pausing turbines near roads and public use areas during icing conditions.

Turbines will be equipped to remotely switch off when site personnel detect ice accumulation. Access to turbines by site personnel will be restricted based on manufacture's recommendations while ice remains on the turbine structure.

Staff will be trained in recognizing this condition and have specific protocols to follow if they are working when such conditions exist. These protocols include contacting the Applicant to determine if an icing event has occurred based on turbine out-put and wind speed, visual inspection for ice, restricting individuals to

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a manufacture's recommended safe distance from an operating iced turbine, and pausing the affected turbine until icing is not a concern.

### **2.16.2.2 No Action Alternative**

Under the No Action Alternative, the proposed Project will not be constructed. The electrical energy that will be produced by the Project will need to be obtained from some other generation source. The risk of fire due to lightning strikes or human activity in the general area will still exist.

### **2.16.2.3 Probable Significant and Unavoidable Adverse Impacts**

As mitigated, the Project will have no probable significant and unavoidable adverse impacts to health and safety.

### **2.16.2.4 Cumulative Impacts**

A health and safety risk associated with the Project is wildfire. The risk of fire would be a concern during construction, operation, and decommissioning. There is the potential that the Project-specific fire risk would contribute to the cumulative fire impact in the general geographic area due to the potential increase burden on emergency response organizations. This risk may be negated due to better access roads for fire response and additional fire suppression equipment available at other Project locations.

The other health and safety risks will result in either localized impacts or have no discernable impacts to the Project. Thus, they would not contribute to cumulative health and safety effects in the general geographic area.

See Sections 2.10 Noise and 2.13 Traffic and Transportation regarding cumulative impacts of noise and traffic accidents.

## **2.17 Cultural Resources**

This section will describe impacts to cultural resources associated with the Project. A cultural resource is any site, building, structure, object, district, traditional cultural place, or cultural/historic landscape that has historical significance at the local, state, or federal level. The Washington State Department of Archaeology and Historic Preservation (DAHP) uses the phrase “cultural and historic resources” for property types representing human culture and heritage, including sites, buildings, structures, objects, districts, traditional cultural places, and cultural/historic landscapes that have been identified and documented as being significant in local or state history, architecture, archaeology, engineering, or culture.

Appendix I of this report is the Cultural Resources Inventory for the BPA Central Ferry Substation. This study was conducted by SWCA Environmental Consultants to fulfill BPA’s Section 106 requirements under the National Historic Preservation Act. While this study does not include the entire Lower Snake River Project, it provides information that is relevant for evaluating the cultural resource context and potential impacts of this Project.

A cultural resources inventory of the Project is currently underway and will be available upon completion of all survey work within the environmental permitting corridors. It is estimated that a draft of the report will be available upon publication of the Final EIS for this Project. This report will include a thorough discussion of the existing cultural context for the Project area, results of all background research and field inventory, and recommendations for avoidance of resources identified during the inventory. This EIS contains only a discussion of impacts of resources identified through background research. The methods and sources for the background research are included in Section 2.17.1. A condensed section which discusses the cultural context for the Project is included in this EIS and will be greatly expanded upon in the cultural resources inventory report. In the meantime the reader should refer to the Cultural Resources Inventory Report for the BPA Central Ferry Substation for an expanded discussion of the regional cultural context.

### **2.17.1 Area of Potential Effect**

The Area of Potential Effect (APE) for cultural resources has been defined as follows: For archaeological resources the APE includes the Project footprint and any other areas where ground disturbing activities may take place. For purposes of analysis, the APE for archaeological resources was expanded to include the environmental permitting corridors. For above ground historical resources (architectural resources) the APE includes the environmental permitting corridor and an area approximately 1.5 miles from the proposed turbine strings. The purpose of this analysis is to evaluate impacts to historic structures which are listed or eligible for listing to the National Register of Historic Places (NRHP).

**2.17.2 Cultural Context**

The Project area is located in the Columbia Plateau physiographic region, which has been occupied by human populations for at least 10,000 years. Native American contact and interaction with Europeans and Euro-Americans in and around the Project area dates from at least as early as the early nineteenth century, marked by the renowned expedition of Meriwether Lewis and William Clark. The following discussion provides a framework for interpreting cultural resources identified during the subject inventory, thus assisting in identification of resources with significant heritage value connected to important past peoples, events, and developments. This discussion also guides research in addressing important questions for the investigation of culture history in the region. Please refer to Appendix I for an expanded discussion of the regional cultural context.

**2.17.2.1 Precontact (Prehistoric) and Ethnographic Eras**

Archaeological evidence, including excavation of dated stratigraphic layers, is consistent with the interpretation that people have lived in the Columbia Plateau region for at least the last 10,000 years. Indigenous oral-history information holds that Native people have lived in the Project area since the beginning of time. Several tribes occupied portions of the landscape in and around the Project area. These tribes consisted of the Walla Walla, Nez Perce, Palouse (Palus), Cayuse, and Umatilla.

***Walla Walla***

Walla Walla territory in historic times centered on the banks of the Columbia River and on lower courses of tributary streams that included the Walla Walla, Yakama, and Snake rivers in southeastern Washington. The Walla Walla spoke a dialect of Sahaptin, known as the Northeast Sahaptin dialect cluster, which originated from the Penutian language family. Though the Walla Walla have long been associated with the Cayuse and the Umatilla, as all three groups spoke dialects of Sahaptin and all three resided on the Umatilla Reservation, each group has its own particular characteristics that can be distinguished from related tribes (Stern 1998:396).

The Walla Walla, along with Cayuse and Umatilla, signed the Umatilla Treaty in 1855 but did not move to the reservation until the treaty was ratified in 1860 (Lahren 1998; Stern 1998). Even after 1860, large settlements of Walla Walla under the leadership of Chief Homlai continued to live along the Columbia River, moving into the Grand Ronde area during certain parts of the year. They were finally forced back onto the Umatilla reservation during the Nez Perce War in 1877 and the Northern Paiute War in 1878 (Stern 1998).

***Nez Perce***

The Nez Perce territory was centered on the Clearwater and middle Snake rivers and the northern portion of the Salmon River in central Idaho, as well as portions of Oregon and Washington (Walker 1998:420). The Nez Perce speak a Sahaptian dialect of the Penutian language family. Nez Perce villages were primarily located



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along secondary streams that emptied into major river tributaries. The political organization of the villages consisted of bands composed of families and extended kinship groups (Walker 1998:424–425).

At the Walla Walla Council of 1855, the Nez Perce signed a treaty ceding most of their 13-million-acre ancestral territory to the U.S. government in exchange for money and a guarantee that 7.5 million acres of their lands would remain intact as a reservation. After the Governor Stevens had signed treaties with several tribes, he proclaimed the Northwest open for settlement (Walker 1998).

In the early 1860s, gold was discovered on Nez Perce lands and, in violation of the 1855 treaty, Euro-American settlers rushed in and laid claim to key lands and minerals. These settlers and their supporters soon began pressuring the U.S. government to open more tribal territory for mining and settlement. In 1863, Governor Stevens again approached the Nez Perce about giving up more tribal lands. Although many Nez Perce leaders refused to negotiate, several others signed a new treaty. This treaty reduced the Nez Perce reservation to 780,000 acres, and the Nez Perce lost their claim to many important traditional areas (Walker 1998).

Upon the death of Old Chief Joseph in 1871, his son, Young Chief Joseph, took over leadership of the Wallowa band. In 1873, the government tried to create a Wallowa reservation for Joseph's band, but abandoned the attempt two years later. Representing his people in a meeting with General Oliver Howard at the Lapwai Council of 1876, Chief Joseph refused to honor the 1863 treaty. The following year, the government gave the tribe 30 days to vacate the Wallowa Valley and move to a reservation near Lapwai, Idaho. Before the move could begin, some young warriors attacked and killed a group of white ranchers, and the U.S. Cavalry was called in, marking the beginning of the Nez Perce War of 1877. Eventually, Chief Joseph and the Nez Perce surrendered to the U.S. Cavalry and lost the Wallowa lands (Walker 1998:434–435).

### ***Palouse (or Palus)***

During historic times the Palouse (also spelled Palus) territory centered around the Palouse and Snake rivers between their confluences with the Columbia River to the west and the Clearwater River to the east. In the western portion of their territory, they shared land and access rights with the Wanapam; in the eastern portion, they shared overlapping territories with the Nez Perce. The Palouse spoke a northeastern Sahaptin dialect of the Sahaptian language family. They cooperatively fished and gathered with neighboring tribes such as the Walla Walla, Yakima, Umatilla, Cayuse, Nez Perce, Spokane, and Coeur d'Alene (Sprague 1998).

As part of Governor Stevens' push to get all Indians within the territory to sign treaties and be moved to reservations, the Palouse signed the Yakama Treaty on June 9, 1855 (Schuster 1998; Sprague 1998). Little was recorded about the

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Palouse during the later half of the 1800s and through the 1900s. By the middle 1900s the last inhabitants of the Palus Village had either already left the village, had died, or were forced to move due to the flooding of the Ice Harbor Dam reservoir. In the 1990s, Palouse descendants were reported as living on the Yakima, Nez Perce, Umatilla, Coeur d'Alene, Colville, Spokane and Warm Springs Reservations (Sprague 1998).

### **Cayuse**

The Cayuse territory extended from the Umatilla and Walla Walla rivers to the west and the Grande Ronde River to the west. The northern boundary reached up to the confluence of the Snake and Tucannon rivers. The Cayuse spoke a language that was distinct from the Sahaptian language family, although by 1837 the Cayuse language had died out, and they began speaking in the Lower Nez Perce dialect (Hulbert and Hulbert 1936–1941, cited in Stern 1998:395).

Treaty negotiations with Isaac Stevens and Joel Palmer began in 1855 at Camp Stevens in the Walla Walla Valley, but the outbreak of the Yakama War forced them to halt the proceedings. On June 9, 1855, the first treaty under these negotiations was signed and the Umatilla Reservation was established. It was not until the treaty was ratified in 1860 that the Cayuse were forced to move to the reservation, which lies in Cayuse territory (Lahren 1998; Stern 1998).

### **Umatilla**

The Umatilla primarily lived along the Columbia, lower Umatilla, and Walla Walla rivers. The Umatilla moved away from the Columbia River during the summer and into the John Day River drainage and the mountains surrounding that area (Confederated Tribes of the Umatilla Indian Reservation 2004; Ray 1936; Stern 1998).

The winter villages of the Umatilla were located along the Columbia River, from its confluence with the Yakima River downstream to the mouth of Rock Creek. Each village was politically autonomous, and its own headman was chosen by a village council made up of the family of the former headman (Ellis et al. 2004; Stern 1998:395–396).

Very close ties existed between the Umatilla and the neighboring Walla Walla and Cayuse tribes. These connections were maintained by intermarriage and an extensive trading network. Winter villages and seasonal camps would often include families from other tribal groups, related by kinship or through friends. Life changed drastically for the Umatilla when contact with Euro-Americans led to smallpox epidemics in 1801–1802 and 1824–1825. These epidemics resulted in a mortality rate of 30 percent or more over the first quarter of the nineteenth century. In the 1840s, diseases such as measles, chicken pox, and whooping cough were introduced by American settlers and approximately 50 percent of the Native American population of the Columbia Plateau was lost (Boyd 1998).

**2.17.2.2 Native American Reservation Era**

In the late eighteenth to early nineteenth centuries, Europeans and Euro-Americans began exploring the Northwest region. Disease, traders, missionaries, and new technology had significant impacts on the Native American people living in the region. The groups were then forced by the U.S. government to relocate their settlements to reservations in the later half of the nineteenth century. Native Americans within and near the Project area were no exception to this general trend, which opened up lands for Euro-American settlement of previously native-occupied territory.

**2.17.2.3 Historic Period*****Early Exploration and Fur Trapping***

The first documented Euro-Americans to enter the vicinity of the current Project area were the members of the Lewis and Clark Expedition. In October 1805, the party descended the Snake River on its way to the Pacific Ocean, passing by, but not entering, the current Project area. The expedition noted “the mouth of a large creek” now identified as the mouth of the Deadman Creek, on October 12, and another, now identified as the mouth of the Tucannon River, the next day. Their camps were on the north side of the river, outside the current Project area (Lewis and Clark 1805a, 1805b).

On their return trip, the party first entered what would become Columbia and Garfield counties, following the Nez Perce Trail from Patit Creek overland, across the Tucannon River, near what would become Marengo, to Pataha Creek, just west of Tatman Gulch. They then ascended Pataha Creek and spent the night of May 3, 1806, encamped on its banks, somewhat to the east of the present site of Pataha City (Plamondon 2004:88–89). The site of this camp, approximately 5 miles east of Pomeroy (outside the current indirect APE) is listed in the National Register of Historic Places (NRHP) both for its association with the Lewis and Clark Expedition and as the last remaining portion of Nez Perce Trail used by Native Americans during the pre- and postcontact periods, and by Euro-Americans during the early postcontact period (see Section 3.1.4.2, Nez Perce Trail). The road itself was noted by Lewis and Clark in their journals (Beale 1971).

During his 1832–1836 survey of the Pacific Northwest, Captain Benjamin L.E. Bonneville passed through what would become Garfield County, engaging and gathering information from fur trappers along the way. In 1834, Bonneville is reported to have followed the Nez Perce Trail west along Alpowa and Pataha creeks (past the present site of Pomeroy), across the Tucannon River (the trail crossed the river near the later location of the community of Marengo) and down the Touchet and Walla Walla rivers to the Columbia River.

***Trails and Wagon Roads***

The Nez Perce Trail, a much-used prehistoric travois road, once passed through the Project area. During the early historic period, the trail was heavily used by

## **2. Affected Environment and Impacts Cultural Resources**

explorers, trappers, traders, missionaries, soldiers, early settlers and miners. The trail was traversed by Lewis and Clark on their return journey in 1806, by Bonneville in 1834, by the missionaries Samuel Parker, Marcus Whitman, and Henry Spalding in the 1830s, and by Colonel Edward Steptoe and his detachment of U.S. Army regulars (Kuykendall 1984).

During the later nineteenth century, the Nez Perce Trail was still used as a primary route between the Pacific Coast and the gold mines of northern Idaho. Parts of the trail eventually became adapted as a wagon road, with new routes established to avoid the parts of the trail that were too steep or otherwise unsuited for loaded wagons (Travis 1967:2). The wagon road originally extended from the confluence of the Columbia and Walla Walla rivers to the confluence of the Snake and Clearwater rivers (present site of Lewiston, Idaho). General Land Office (GLO) maps show the trail crossing through the Project area, suggesting that as late as 1864, the Nez Perce Trail was still evident in its entirety. In subsequent decades, as wheat farming came to dominate local land use, much of the physical evidence of the Nez Perce Trail was obliterated, although portions of the trail may remain in deep draws and steep terrain where plowing was not practiced (Kuykendall 1984:15–16; Travis 1967).

The Lewis and Clark National Historic Trail is a commemorative trail that has been established in honor of the journey of the Lewis and Clark expedition of 1804-1806. The Lewis and Clark National Historic Trail was designated a National Historic Trail in 1978 under the provisions of the National Trails Act of 1968 (Public Law 95-625). Neither the actual route nor the commemorative route has been evaluated for NRHP eligibility. However, the designation of National Historic Trail implies that the trail may be potentially eligible for the NRHP, and the resource should be treated as such.

The Lewis and Clark journals (Moulton 1991) and reconstructed trail maps (Plamondon 2004) indicate that the Lewis and Clark expedition may have traversed the Project area on their return journey in early May, 1806; however, no physical evidence of the trail has been documented within the Project area. On their return journey, Lewis and Clark may have also followed the route of the Nez Perce Trail, as evident on GLO maps and Lewis and Clark's trail maps.

A review of several historic GLO maps has identified 19 historic roads adjacent to or within the APE (see Table 2-67). These resources have not yet been evaluated. A field survey of the direct APE will determine if these trails or roads are still in existence.

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**Table 2-67 Historic roads and trails identified on historical maps within the Project's direct APE.**

Map Date	Township(s)/ Range(s)	Feature Name/Type	WRA	Current Disposition
1874	11N/38E	"Territorial Road from Walla Walla to Fort Colville"/ Road	Tucannon	Follows parts of "W. Bramhill Rd./Prater Rd./Smith Hollow Rd."/Improved Road
1874	11N/38E	Unnamed Trail/ Trail	Tucannon	Not visible from aerial
1874	11N/38E	Unnamed Trail/ Trail	Tucannon	Not visible from aerial
1874	11N/38E	Unnamed Road/Road	Tucannon	Not visible from aerial
1874	11N/38E	Unnamed Road/Road	Tucannon	Not visible from aerial
1873	12N/38E	Unnamed Road/Road	Tucannon	Not visible from aerial
1873	12N/38E	Unnamed Trail/ Trail (not on T11N/ R38E 1874 map)	Tucannon	Follows portion of "Territorial Rd."/Improved Road
1865	11N/39E	Unnamed Road/Road	Tucannon	Not visible from aerial
1876 1864	13N/40E 12N/40E	"Territorial Road"/ Road	Kuhl Ridge	"Hagen Road"—unimproved
1876	13N/40E	Unnamed Trail or Road/ Trail or Road	Kuhl Ridge	No longer visible on aerial
1864	12N/41E	Unnamed Trail or Road/ Trail or Road	Kuhl Ridge	No longer visible on aerial
1864	12N/41E 12N/40E 11N/41E	"Lewiston and Walla Walla Road"/ Road	Kuhl Ridge and Oliphant Ridge	"Hwy 12"—improved; some portions of original road may be unimproved just north of Hwy 12
1864	11N/41E	"Nez Perce Trail"/ Trail	Oliphant Ridge	May be slightly visible in aerial in SW ¼ of Section 7
1864	11N/41E	Unnamed Road/ Road	Oliphant Ridge	"Hwy 12"—improved;-it is possible that it was originally a slightly visible unimproved road north of Hwy 12
1864	11N/41E	"Trail from Penawawa to ?"	Oliphant Ridge	"East Oliphant Road"—unimproved
1864	12N/40E	Unnamed Road/ Road	Oliphant Ridge	Unnamed road—unimproved in Sec. 5; "Hwy 12"—improved in Sec. 25
1864	12N/40E	Unnamed Road/ Road	Oliphant Ridge	Undefined on aerial in Sec. 20 and portions of 29; "Jackson Road"—unimproved in Sec. 28, 33 and portions of 29
1864	12N/40E	Unnamed Road/ Road	Oliphant Ridge	Undefined on aerial
1864	12N/40E	Unnamed Trail/ Trail	Oliphant Ridge	No longer visible on aerial

### **Railroads**

The railroad that passes through Pataha Valley and the indirect APE was originally constructed by the Oregon Railway and Navigation Company (ORwy&N Co.) in 1886 as an extension of the rail network built from 1880 to 1884 connecting Portland with eastern points including Huntington, Oregon, and Spokane, Washington (Robertson 1995:117). As composed in 1884, the

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ORwy&N Co. rail line passed through Starbuck, Washington, 25 miles to the west of Pomeroy.

In 1896, the ORwy&N Co. failed and was sold at foreclosure to the newly formed Oregon Railroad & Navigation Company (OR&N Co.). In 1910, OR&N Co. was sold to the newly formed Oregon-Washington Railroad & Navigation Company (OWR&N Co.). The OWR&N Co. operated until January 1, 1936, when it was leased in its entirety to the Union Pacific Railroad Company (Robertson 1995:122). During the latter decades of the twentieth century, changes in bulk shipping brought about the end of the railroad era in this part of Garfield County. The railroad line through Pomeroy was abandoned by the Union Pacific in 1981. In 1986, the tracks were removed and the rail corridor through town was replaced with a linear park known as Centennial Boulevard (Donovan 2003: Section 8, p.12).

### **Columbia County**

Columbia County was formed from Walla Walla County in 1875, consisting roughly of the western half of Walla Walla County and including the present Columbia County as well as the current Garfield and Asotin counties until 1881. Initial settlement in the area was as early as the early 1850s when Louis Moragne settled on the Tucannon River, near the present-day townsite of Marengo, which is derived from his name.

In the election of 1876, Dayton was selected as the county seat over Marengo, and the selection was decisive and permanent. By settling the seat of government in Dayton, however, as opposed to the more centrally located Marengo, the stage was set for the creation of Garfield County to the east (Lyman 1918:322–323).

### **Garfield County**

The formation of Garfield County from Columbia County in 1881 was the result of the rapid settling of this area during the late 1870s. On November 29, 1881 Garfield County was created, named for President James A. Garfield (Kuykendall 1984:39; Lyman 1918:365). The seat of Garfield County was fixed at Pomeroy in May 1884 (Kuykendall 1984:66).

### **Agriculture**

The first intensive wheat farming in southeastern Washington began in the late 1850s and early 1860s around Walla Walla. In the 1870s, farmers near Walla Walla began experimenting with grains on terrain similar to that found in the vicinity of the current Project area. The success of these experiments led to the adoption of dryland wheat farming in the plateaus and prairies of large sections of southeastern Washington and eastern Oregon (Keith 1976).

**2.17.2.4 Regulatory Setting*****Federal Regulations***

The protection of cultural resources has been provided for through the establishment of the National Historic Preservation Act (NHPA) of 1966 80 Stat. 915, 16 U.S.C. 470 et seq., as amended, NHPA authorizes the Secretary of the Interior to expand and maintain a National Register of districts, sites, buildings, structures, and objects significant in American history, architecture, archeology, engineering and culture. The regulations herein set forth the procedural requirements for listing properties on the National Register.

The National Register is an authoritative guide to be used by Federal, State, and local governments, private groups and citizens to identify the Nation's cultural resources and to indicate what properties should be considered for protection from destruction or impairment. Listing of private property on the National Register does not prohibit under Federal law or regulation any actions which may otherwise be taken by the property owner with respect to the property.

The following are criteria for evaluating a property's eligibility to the National Register:

The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- A. That are associated with events that have made a significant contribution to the broad patterns of our history; or
- B. That are associated with the lives of significant persons in or past; or
- C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. That have yielded or may be likely to yield, information important in history or prehistory.

***State Regulations***

The State of Washington addresses cultural resources in Chapter 27 of the Revised Code of Washington (RCW). Section 53 establishes the definition of archaeological resources, establishes the requirement of a government-issued permit prior to the disturbance of any archaeological site, creates the Department of Archaeology and Historic Preservation (DAHP), and establishes penalties for failure to comply with preservation laws. This chapter also stipulates that it is unlawful for a person, firm, corporation, agency or institution of the state to knowingly disturb or deface any historic or prehistoric archaeological resource or site, or to remove archaeological objects from a site without a permit granted by

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the DAHP. This includes archaeological sites that are located on privately owned land.

Section 44 of Chapter 27 of the RCW establishes laws to protect prehistoric and historic human burials. Unlawful disturbance of Native American human remains is a class C felony and the perpetrators are at risk of prosecution as well as a civil action from the affected Native American Tribe. Upon any discovery of human remains, the discoverer is obligated to cease any ground disturbing activities in the area of the find, to make efforts to protect the find from further disturbance, and to notify the county coroner and the local law enforcement.

The Washington Heritage Register is a listing of historic structures, districts, buildings, sites and objects that have been identified as being significant in local or regional state history. The Register is governed by several state laws including Senate Bill 363, RCW 27.34.200 and 25-12 WAC.

In an attempt to protect historic graves and cemeteries from deliberate looting and destruction, the State of Washington passed the *Abandoned and Historic Cemeteries and Historic Graves [RCW 68.60.040 and RCW 68.60.050]* Establishes protection for historic cemeteries and graves. Persons disturbing historic graves through inadvertence, including disturbance through construction, shall reinter the remains under the supervision of the DAHP and will be found guilty of a Class C felony.

The Department of Archaeology and Historic Preservation (DAHP) administers to the cultural resources needs of the state. The DAHP issues *Archaeological Excavation and Removal Permit [WAC 25-48]* to ensure that excavations of archaeological sites are conducted by appropriately trained professional archaeologists.

### **Local Regulations**

Garfield County has a local zoning ordinance that contains a “historic district overlay.” The implications of this historic district overlay are discussed in the Visual Resources Section 2.9 above. In the absence of other local ordinances, impacts to cultural resources must be evaluated under SEPA and mitigation must comply with applicable state and federal regulations.

The Garfield County and City of Pomeroy Comprehensive Plan adopted in April, 2008 does identify that the protection of cultural and historic resources as an objective, and the stated policy is to amend and adopt land development regulations, and that proposed plan amendments and requests for new development or redevelopment will be evaluated, in part, on its impacts to cultural resources (Garfield County and City of Pomeroy 2008).



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### 2.17.2.5 Previous Research in the Project Area

A professional archaeologist from SWCA conducted a file search at the Washington DAHP on December 4 and 8, 2008, January 13, 2009, March 25, 2009, and April 30, 2009, based on the legal sections encompassing the proposed Project area. File searches included previous cultural resource inventories, known archaeological site and isolate forms, historic cemeteries records, and aboveground historic resource records. The search for archaeological resources was extended to a 1-mile buffer around the WRA boundaries. The search for historic cemeteries and aboveground resources was extended to a 1.5-mile buffer around the turbine locations.

The site records review was supplemented by an online search of GLO maps in August 2008 and April 2009, focused on features depicted within the direct APE and an inspection of U.S. Geological Survey (USGS) 7.5-minute quadrangle maps. Together, these sources provide an overview of the potential for possible historic resources within the direct APE of the proposed Project area.

A total of 40 previous cultural resource inventories and other related studies were identified within 1 mile of the Project area. Twenty-two of these studies were conducted outside of the current Project area (yet at least portions were conducted in the 1-mile buffer) (see Table 2-68); the relationship of one study (DAHP no. 1341881) to the Project area is indeterminate due to the lack of a map in the study's documentation; and the remaining 17 studies were conducted wholly or in part within one or more portions of the current Project area (see Table 2-68). Three of the 17 studies were conducted wholly or in part within some portion of the direct APE for the current Project. Tracy's (1995) cultural resource inventory yielded no significant finds. Surveys by Sappington et al. (1989) and Hansen (1985) yielded positive results, but neither study identified any cultural resources in or near the current direct APE.

**Table 2-68 Summary of Previous Studies**

Author	Year	Name	WRA	Results
Rice	1982a	A Survey for Cultural Resources at Pit Site QS-CO-53, Columbia County, Washington	Tucannon	Negative
Rice	1982b	A Cultural Resources Survey SR 126: Pahah Creek Bridge 126/102 (L-6989)		Negative
Rice	1982a	A Survey for Cultural Resources at Pit Site QS-CO-53, Columbia County, Washington	Tucannon	Negative
Cleveland	1975	Archaeological and Historic Survey of the Little Goose-Lower Granite Transmission Line		Negative
Rice	1987	A Survey for Cultural resources along the Route of SR12, From the Junction of SR 261 to Archer Road, Columbia County, Washington	Oliphant Ridge	Negative
Sappington et al	1989	Results of the Class III Intensive Field Inventory for Cultural Resources of the Proposed AT&T Fiber Optic Cable Route from the Walla Walla Vicinity to Spokane, Washington	Kuhl Ridge	Positive

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**Table 2-68 Summary of Previous Studies**

Author	Year	Name	WRA	Results
Holstine and Rice	1993	A Cultural Resource Survey of the Washington State Department of Transportation's Pit Expansion Site QS-CO-16 on SR 12, Columbia county, Washington	Partly in Oliphant Ridge and Tucannon	Negative
Tracy	1995	Cultural Resource Inventory Report Hartsock Habitat Management Unit, Walla Walla District, Corps of Engineers	Oliphant Ridge	Negative
Keith	2008	Cultural Resource Inventory Report Phragmites Control Project Addendum Report No. 02-LiGo-016		Negative
Davies	2002	Cultural Resource Survey of the Garfield County Proposed Access Road and Patah Creek Bridge		Negative
Keith	2002	Cultural Resource Inventory Report Lower Granite/Little Goose Sign Installations Report No. 2-LoGr-023		Negative
Schumacher and Baldwin	2002	Cultural Resource Survey for the Washington State Department of Transportation's Dixon Quarry Site, Vicinity of SR-12, MP 398	Kuhl Ridge	Negative
Schumacher	2002	Wash DOT's QS-CO-016 Quarry Site, Vicinity of SR 12, Columbia County		Negative
US Army Corps of Engineers Walla Walla District	2000	Dredge Material Management Plan and Environmental Impact Statement McNary Reservoir and Lower Snake River Reservoirs	Unknown	Positive
Amara	2003a	Herres Land Company et al. EQIP Log No.:071103-11-NRCS	Kuhl Ridge and Dutch Flats	Negative
Tracy	2003	Cultural Resource Inventory Report No. 04-LiGo-004: New York Bar Access Road Rehabilitation		Negative
Schumacher	2003	Cultural Resources Survey for the Washington State Department of Transportation's U.S. 12/SR261 Vicinity – Unstable Slope, MP 383.21 to MP 383.35, Columbia county, Washington		Negative
Lenz	2004a	A Cultural Resource Survey of the Howard Property near Dayton, Columbia Washington	Oliphant Ridge	Negative
Bard et al.	2003	Cultural Resources Technical Report Hopkins Ridge Wind Power Project		Positive
Farrow	2004	Traditional Cultural Property Assessment of Renewable Energy Systems' Proposed Hopkins Ridge Wind Farm		Positive
Lenz	2004b	Cultural Resources Survey of Selected Parcels of the Howard Irrigation Flow Enhancement Project Near Dayton, Columbia County, Washington	Oliphant Ridge	Negative
Amara	2003b	CREP EQIP, WHIP in Columbia County	Tucannon	Negative
Historical Research Associates	2001	Cultural Resources Background Research and Field Inventory for American Tower's Proposed Jackson Communications Site, Columbia County, Washington		Negative
Lenz	2005a	A Cultural Resource Survey of the Gerald Howard Irrigation Efficiency and conveyance Enhancement Project near Dayton, Columbia County, Washington		Negative
Lenz	2005b	A Cultural Resource Survey Hovrud Irrigation Efficiency and Conveyance Enhancement Project near Dayton, Columbia County, Washington		Negative

**Table 2-68 Summary of Previous Studies**

Author	Year	Name	WRA	Results
Lenz	2005c	The Cultural Resource Survey of Selected Parcels of the Turner, Alternative Livestock Watering Project near Dayton, Columbia County, Washington		Negative
Lenz	2005d	The Cultural Resources Survey of the Broughton Land Company (BLC) Irrigation Efficiency and Conveyance Enhancement Project Near Dayton, Columbia County, Washington		Negative
Dickson	2005	Cultural Resource Survey for the Proposed Grote Bridge Replacement, Columbia county, Washington	Tucannon	Negative
Keith	2006	Cultural Resource Inventory Report for Klaveno Lease Extension		Negative
Lenz	2006a	A Cultural Resource Survey of the NRCS Sponsored Jerome Hovrud EQIP 2005 Main Waterline Project (Contract #7405465A791) near Dayton, Columbia County, Washington		Site Update completed
Lenz	2006b	Cultural Resources Survey of the NRCS Sponsored Hall EOP 2005 Lovestock Watering System (Contract #7405465A435) Near Dayton, Columbia County Washington		Negative
Komen	2006	Cultural Resources Survey of Washington DOT's Quarry, QS-CO-16, Extension C, Columbia County, Washington		Negative
Rice	1987b	A Survey for Cultural Resources along the Route of SR261 in the Vicinity of Starbuck, Columbia County, Washington		Negative
Cannell	2007	Archaeological Inventory of the Proposed Improvements to Columbia Street, Pomeroy, Washington		Negative
Smith and Callum	2007	NRCS Jim McKiernan WHIP 2006 Site Identification Survey in Garfield County, Washington (DAHP Log No. 030207-04-NRCS)		Negative
Donovan	2007	Historic Resource Survey Report, City of Pomeroy Downtown Revitalization Project: STPE-0985		Positive
Hansen	1985	Office of Archaeology and Historic Preservation Inter-Office Memorandum; Reconnaissance Survey, Dayton to Colfax	Kuhl Ridge and Tucannon	Positive
Sappington et al.	2008	A Cultural Resource Survey for a Proposed CREP Livestock Watering Project on the John Laib Property along the Tucannon River in Columbia County, Southeastern Washington		Negative
Baird	2008	Report no. 08-NPT-11, Peola Road Survey, Garfield County, Washington	Dutch Flats	Negative
Hughes et al.	2007	Cultural Resources Report of the Dayton Wind Project, Columbia Co		Negative

### 2.17.2.6 Previously Recorded Cultural Resources

The literature review identified many cultural resources within the WRAs; however, several of these resources have not been field verified. The archaeological and aboveground resources that have been previously identified and recorded within the WRAs are discussed below. The documentation for these resources is on file at the Washington DAHP.

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### Tucannon WRA

The literature review identified one archaeological site (45CO25), a precontact rockshelter, within the WRA recorded in 1952. This site has not been evaluated for listing NRHP. The current condition of this resource is unknown.

### Kuhl Ridge WRA

The Kuhl Ridge WRA includes a Bonneville Power Administration (BPA) Substation. A cultural resources field survey for the proposed BPA substation resulted in the documentation of one newly discovered archaeological site (temporary site number WBS004). The site is a historic period site associated with agricultural activities. The site has been recommended not eligible for listing in the NRHP (36 CFR 60.4). As a federal agency, BPA is responsible for compliance with Section 106 of NHPA and will be conducting all necessary consultation associated with their proposed undertaking.

### Dutch Flats WRA

The Downtown Pomeroy Historic District is located adjacent to the northern boundary of this WRA. This district was listed in the NRHP in 2003.

### Oliphant Ridge WRA

There have been no cultural resources documented within the WRA.

## **2.17.3 Impacts and Mitigation**

### **2.17.3.1 Preferred Alternative**

#### ***Construction Impacts***

Project construction activities have the potential to impact to cultural resources if the construction of the wind farm, access road and ancillary facilities will physically disturb the setting or attributes of a cultural resource for which it is considered significant. Avoidance of known resources would eliminate the impact. The following impact assessment is limited to the resources identified during the literature review. Field inventories are underway and will be finalized and results sent to appropriate agencies prior to construction activities commencing. Additional impacts could occur as the result of inadvertent discovery of cultural resources during construction. The mitigation measures provided at the end of this section include conditions for addressing inadvertent discoveries.

### Tucannon WRA

One site, a precontact rockshelter (45CO25), was identified. The site is not within the Project APE and will be avoided; and therefore, no impact will occur.

### Kuhl Ridge WRA

A cultural resources survey conducted for a substation associated with the Project resulted in the identification of a single cultural resource (WBS004), which was evaluated for its significance and eligibility to be listed in the NRHP. This resource is classified as a historic-period archaeological site, consisting of three

## **2. Affected Environment and Impacts Cultural Resources**

pieces of agricultural equipment. The site was adequately recorded in the field, and requisite forms have been completed (see Appendix I). Subsurface testing was also conducted at the location of the site; however, no subsurface artifacts were identified. Site WBS004 does not appear to represent a significant archaeological resource; and therefore, there will be no impact.

### Dutch Flats WRA

No resources were identified during the literature review of the Dutch Flats WRA.

### Oliphant Ridge WRA

No resources were identified during the literature review of the Oliphant Ridge WRA.

### ***Project Facility Impacts***

Impacts to cultural resources would largely be associated with construction of the facility and ground disturbing operations. General potential impacts to resources within all of the WRA's include increased traffic in the Project area associated with operation and maintenance of the facility. Whenever more people are brought into an area there is an increased risk of artifact collecting from archaeological sites. Maintenance and repairs to the Project may require ground disturbing activities. If such activities are planned in areas not previously surveyed there is a potential to impact previously unidentified cultural resources.

### Tucannon WRA

No impacts identified specific to this WRA.

### Kuhl Ridge WRA

No impacts identified specific to this WRA.

### Dutch Flats WRA

The Pomeroy Historic District is the only resource identified within or near the Dutch Flats WRA. Although the district is not within the WRA it may be impacted indirectly by disturbance to the historic district's setting from the visual presence of the Project. This section only considers impacts to the historic district as a cultural resource, potential visual impacts to the town of Pomeroy and associated Historic District are discussed in Section 2.9 Visual Resources.

The Pomeroy Historic District was deemed eligible to the NRHP under Criterion A and C (36 CFR 60.4 [a, c]). The district was determined to be eligible under Criterion A as an intact concentration of commercial buildings reflecting the development of the City of Pomeroy from the later nineteenth century through the mid-twentieth century as the leading commercial center for the region, which was dominated by ranching and farming. Under Criterion C, the district was determined to be eligible as an intact collection of commercial buildings that demonstrate the dominant architectural styles and building methods of the period

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of significance (1887-1953), with commercial, governmental, social/fraternal, recreational, and transportation-related property types all represented.

Based on the NRHP nomination form for the Downtown Historic District, the district does not appear to draw eligibility from the greater setting in which it is located. While the setting and viewshed of the surrounding landscapes are relatively unchanged, the eligibility of the district itself is embodied in its internal characteristics, specifically, the nature, distribution, design, and character of the buildings within the district itself. While the construction of the Project will add a new feature on the landscape and will alter surrounding landscape, it is unlikely to have impacts on the Historic District such that it would jeopardize the district's eligibility to be listed on the NRHP. It is therefore determined that there will be no impact to the continued NHRP eligibility of the Pomeroy Historic District.

### Oliphant Ridge WRA

No impacts identified specific to this WRA.

### ***End of Design Life Impacts***

Decommissioning of the Project should not have an impact on cultural resources as activities associated with the decommissioning should be able to stay within areas previously disturbed during construction of the facility. If any of the decommissioning activities cause ground disturbance in areas not previously surveyed for cultural resources there could be impacts to undocumented cultural resources.

No impacts to cultural resources are expected to result from repowering turbines or continuing Project operations beyond estimated Project life, as all such future modifications would be expected to remain within the existing Project footprint.

### Tucannon WRA

No impacts identified specific to this WRA.

### Kuhl Ridge WRA

No impacts identified specific to this WRA.

### Dutch Flats WRA

No impacts identified specific to this WRA.

### Oliphant Ridge WRA

No impacts identified specific to this WRA.

### ***Mitigation***

The following mitigation measures are to be imposed for all four WRAs.

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- A pedestrian survey (inventory) of the environmental permitting corridors should be conducted prior to any ground disturbance associated with the Project. The intent of the inventory will be to document all archaeological sites located in the Project area. Avoidance of archaeological sites is the preferred method of mitigation; however sites that cannot be avoided must be evaluated for eligibility to be listed on the NRHP. The DAHP and local tribes must be consulted on appropriate mitigation for sites that cannot be avoided.
- A cultural resources sensitivity training for personnel working on Project construction should be conducted. The purpose of this training will be to instruct Project personnel on the sensitivity of cultural resources in the Project area, and introduce them to the tribe's perspective on potential impacts. Individuals from the Confederate Tribes of the Umatilla Indian Reservation (CTUIR) and the Nez Perce will be invited to contribute to this training.
- During Project construction all sites that have been determined to be eligible for the NRHP must be avoided. This will be coordinated by an on-site environmental manager who will know the precise boundaries of the resources. All site locations will remain confidential.
- Upon the discovery of human remains, work within 200 feet of the discovery will cease, the local law enforcement, and county coroner would be notified in the most expeditious manner possible (Chapters 27.44, 68.50, and 68.60 RCW). Efforts would be taken to protect the area of the find from further disturbance. If the remains are determined to be associated with an archaeological site, the DAHP, and affected tribes will be notified. Appropriate measures will be taken to ensure the site is protected from further disturbance until a treatment plan is agreed upon by all involved parties.
- Upon the discovery of previously unrecorded cultural resources all work in the area must stop within 200 feet of the discovery. DAHP and the affected tribes will be notified within 24 hours of the find.
- The Confederate Tribes of the Umatilla Indian Reservation (CTUIR) and the Nez Perce Tribes have requested to be involved in the identification and treatment of cultural resources associated with the Project. The Applicant has invited members of both tribes to participate in the cultural resources inventory. The Applicant will ensure that the tribes are updated on the status of the Project on a mutually agreed upon interval.

### **2.17.3.2 No Action Alternative**

Under the no action alternative the Project would not be constructed and there would be no impacts to cultural resources.

**2.17.3.3 Probable Significant and Unavoidable Adverse Impacts**

As mitigated, the Project will have no probable significant and unavoidable adverse impacts to cultural resources.

**2.17.3.4 Cumulative Impacts**

Cumulative impacts to cultural resources are expected from any reasonably foreseeable future projects that will involve ground disturbing activities. The relatively low density of cultural resources identified in the Project area is indicative of the overall condition of cultural resources on similar lands in the two counties. Most of the resources identified in the literature review and during field surveys were associated with historic agricultural activities. No impacts to these resources are anticipated; therefore no cumulative impacts to cultural resources in the region are anticipated. In the case of cultural resources discovered during subsequent investigations, avoidance of cultural resources and mitigation of impacts where they cannot be avoided would lessen the cumulative impacts of this and future projects.



# 3

## Required Permits and Consultation

Table 3-1 provides a list of those permits and approvals anticipated for the Project.

**Table 3-1 Permits and Consultation that May be Required for the Project**

Permit/Consultation	Agency	Activity	Before Construction	Before Operation	Notes
Clean Water Act Section 404 Permit	U.S. Army Corps of Engineers (USACE) – Walla Walla District	Discharge/impacts to jurisdictional wetlands and/or other waters of the U.S. (i.e., excavation, fill)	Yes	Yes	Detailed project drawings, including the location of the project in relation to wetlands and other waterbodies are required with application submittal.
Clean Water Act Section 401 Water Quality Certification	WA Department of Ecology	Discharges/impacts to jurisdictional wetlands and/or other waters of the U.S.	Yes	Yes	If applicable, mitigation plans, operation and maintenance plans, stormwater site plans and restoration plans may need to be submitted along with the application.
National Pollutant Discharge Elimination System (NPDES) Construction General Permit (and State Stormwater Construction General Permit)	WA Department of Ecology	Ground disturbance exceeding 1 acre	Yes	Yes	Complete and submit a Notice of Intent (NOI) at least 30 days prior to commencing construction activities. Storm Water Pollution Prevention Plan (SWPPP) must be prepared prior to construction activities. SWPPP must include at a minimum: site description, site map, and a narrative description of BMPs that will be implemented before, during and after construction.
Sand and Gravel General Permit – Portable Facilities (NPDES and State Waste Discharge General Permit)	WA Department of Ecology				

3-2

**Table 3-1 Permits and Consultation that May be Required for the Project**

Permit/Consultation	Agency	Activity	Before Construction	Before Operation	Notes
Hydraulic Project Approval/Joint Aquatic Resource Permit Application	WA Department of Fish and Wildlife	Activities that use, divert, obstruct, or change the natural flow or bed of any water of the state	Yes	N/A	A complete application package for an HPA must include a completed Joint Aquatic Resource Permit Application (JARPA) form, general plans for the overall project, and complete plans and specifications of the proposed work within the ordinary high water line in fresh waters of the state, complete plans and specifications for the proper protection of fish life, and notice of compliance with any applicable requirements of the State Environmental Policy Act (SEPA).
Well Construction and Operator’s License	WA Department of Ecology	Construction of water wells, monitoring wells, geotechnical soil borings	Yes	N/A	A Notice of Intent to construct a well must be submitted to Ecology at least 72 hours prior to well construction.
Section 106 of National Historic Preservation Act	Department of Archaeology and Historic Preservation (DAHP)	Construction activities that may disrupt or destroy cultural or historic resources	Yes – may include potential surveys	N/A	Consultations with DAHP and any affected tribes must be undertaken
Endangered Species Act – Section 7 Consultations	NOAA Fisheries; U.S. Fish and Wildlife Service	Projects requiring Federal 404 permit or with the potential to adversely affect federally-listed species or their habitat	Yes	N/A	USFWS consultation required; potentially conduct biological surveys and prepare a Biological Assessment
Federal Aviation Administration (FAA) Form 7460: Notice of Proposed Construction or Alteration	Federal Aviation Administration	Erecting structures greater than 200 feet tall	Yes	N/A	Latitude and longitude need to be provided for each wind turbine tower, as well as ground elevation
General Order of Approval for Concrete Batch Plants	WA Department of Ecology, Eastern Regional Office	Operation of temporary onsite concrete batch plant	Yes	N/A	

3-3

**Table 3-1 Permits and Consultation that May be Required for the Project**

Permit/Consultation	Agency	Activity	Before Construction	Before Operation	Notes
General Order of Approval for Portable Rock Crushers	WA Department of Ecology	Operation of temporary onsite portable rock crushers	Yes	N/A	
Highway Access Permit	WA Department of Transportation	Any private access to U.S. 12 or SR 127	Yes	N/A	Site plan, vehicle trips generated, drainage plan, and property owner information are required with the permit application
Building Permit	Garfield County Public Works; Columbia County Public Works	Development and facility construction	Yes	N/A	Including other necessary County development approvals, such as water, septic, addressing, etc.
Conditional Use Permit	Garfield County Public Works; Columbia County Planning Department	Construction of a wind energy facility in agriculturally zoned area	Yes	N/A	
Right of Way Permit (includes both access and use)	Columbia County Public Works	Placement of utilities within county right of way and construction/modification of an approach to a county road	Yes	N/A	Requires the submittal of a site plan showing the site location and location of utilities to be installed in relation to the road, as well as right of way limits
Right of Way Use Permit	Garfield County Public Works	Placement of utilities within county right of way	Yes	N/A	Requires the submittal of a site plan showing right of way limits and a plan view
Right of Way Approach Permit	Garfield County Public Works	Construction or modification of an approach to a county road	Yes	N/A	Requires the submittal of a site plan showing right of way limits and a plan view
Haul Road Agreement	Garfield County Public Works	Hauling operations	Yes	N/A	Requires the completion of a Road Use plan which designates which county roads are to be used, vehicle trips/day, hours and dates of travel, gross weight loadings, vehicle types, etc.

3-4

**Table 3-1 Permits and Consultation that May be Required for the Project**

Permit/Consultation	Agency	Activity	Before Construction	Before Operation	Notes
Franchise Agreement/Bonding	Columbia County Public Works	Hauling operations/roadway usage	Yes	N/A	No haul road agreement exists in Columbia County; instead, a bonding requirement is placed. The franchise agreement/bonding are addressed in the CUP.
	Garfield County Public Works	Occupancy and Use Agreement	Yes	N/A	Requires a fully executed Franchise Agreement as per Garfield and Columbia counties' accommodation of utilities policies.
Critical Areas Review/Determination	Garfield County Public Works; Columbia County Planning Department	Working in or near critical areas	Yes	N/A	



# 4

## List of Preparers

Name	Role
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# 5

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