Record of Decision for the Electrical Interconnection of the Lower Snake River Wind Energy Project January 2010

INTRODUCTION

Bonneville Power Administration (BPA) has decided to offer contract terms for interconnection of up to 1,250 megawatts (MW) of power to be generated by the proposed Lower Snake River Wind Energy Project (Wind Project or Project) into the Federal Columbia River Transmission System (FCRTS). The Wind Project will be developed by Puget Sound Energy (PSE) in Garfield and Columbia counties, Washington. The local county governments are the siting authorities for the Wind Project. PSE has received a Conditional Use Permit (CUP) from Garfield County that authorizes PSE to construct and operate the portion of the Wind Project in Garfield County, and expects to soon receive a similar CUP from Columbia County. PSE has requested interconnection of its Wind Project to the FCRTS on BPA's existing Little Goose-Lower Monumental Nos. 1 and 2,500-kilovolt (kV) transmission lines near the Port of Central Ferry, Washington. BPA will construct a new substation to accommodate this additional power into the FCRTS.

BPA's decision to offer terms to interconnect the Wind Project is consistent with BPA's Business Plan Final Environmental Impact Statement (BP EIS) (DOE/EIS-0183, June 1995), the Business Plan Record of Decision (BP ROD, August 15, 1995), and the Supplement Analysis to the BP EIS (April 2007). This decision thus is tiered to the BP ROD.

BACKGROUND

BPA is a federal agency that owns and operates the majority of the high-voltage electric transmission system in the Pacific Northwest. This system is known as the FCRTS. BPA has adopted an Open Access Transmission Tariff (Tariff) for the FCRTS, consistent with the Federal Energy Regulatory Commission's (FERC) *pro forma* open access tariff.[1] Under BPA's Tariff, BPA offers transmission interconnection to the FCRTS to all eligible customers on a first-come, first-served basis, with this offer subject to an environmental review under the National Environmental Policy Act (NEPA).

For all requests for interconnection of generating facilities that exceed 20 MW, BPA chooses to act consistently with FERC's Order No. 2003, Standardization of Large Generator Interconnection Agreement and Procedures, and Order No. 661, Interconnection for Wind

[1] Although BPA is not subject to FERC's jurisdiction, BPA follows the open access tariff as a matter of national policy. This course of action ensures that BPA will receive reciprocal and non-discriminatory access to the transmission systems of utilities that are subject to FERC's jurisdiction.

Energy, as adopted by BPA and incorporated, with FERC approval, into BPA's Tariff. Order No. 2003 established the Large Generator Interconnection Procedures (LGIP) and Large Generator Interconnection Agreement (LGIA), which provide a uniform process for offering interconnection to any generating facilities exceeding 20 MW. Order No. 661 contains additional standardized processes and technical requirements specific to interconnection of wind generators. BPA has adopted its LGIP and LGIA as Attachment L to its Tariff.

In its Order 2003 Tariff filing, BPA included provisions in its LGIP to reflect BPA's obligation to complete an environmental review under NEPA of a proposed large generator interconnection before deciding whether to offer a final LGIA to the party requesting interconnection.

In August and October 2007, Blue Sky Wind, LLC, a subsidiary of RES Americas (RES), and PSE submitted five generator interconnection requests (250 MW each for a total of 1,250 MW) to BPA to interconnect its proposed Lower Snake River Wind Energy Project to the FCRTS. Since the interconnection requests were made, PSE has acquired the entire interest in the Wind Project. Consistent with its Tariff, including the LGIP, BPA must respond to this interconnection request.

RELATIONSHIP TO BUSINESS PLAN EIS

In response to a need for a sound policy to guide its business direction under changing market conditions, BPA explored six alternative plans of action in its BP EIS. The six alternatives were: Status Quo (No Action), BPA Influence, Market-Driven, Maximize Financial Returns, Minimal BPA, and Short-Term Marketing. The BP EIS examined each of these six alternatives as they relate to meeting the regional electric energy need in the dynamic West Coast energy market. The analysis focused on the relationships among BPA, the utility market, and the affected environment and evaluated transmission as well as generation, comparing BPA actions and those of other energy suppliers in the region in meeting that need (BP EIS, Section 1.7).

In the BP ROD, the BPA Administrator selected the Market-Driven Alternative. Although the Status Quo and the BPA Influence Alternatives were the environmentally preferred alternatives, the differences among alternatives in total environmental impacts were relatively small. Other business aspects, including loads and rates, showed greater variation among the alternatives. BPA's ability to meet its public and financial responsibilities would be weakened under the environmentally preferred alternatives. The Market-Driven Alternative strikes a balance between marketing and environmental concerns, including those for transmission-related actions. It is also designed to help BPA ensure the financial strength necessary to maintain a high level of support for public service benefits, such as energy conservation, and fish and wildlife mitigation and recovery activities.

In April 2007, BPA completed a review of the BP EIS and ROD through a Supplement Analysis. The Supplement Analysis was prepared to assess whether the BP EIS still provides an adequate evaluation, at a policy level, of environmental impacts that may result from BPA's current business practices, and whether these practices are still consistent with the Market-Driven alternative adopted in the BP ROD. Changes that have occurred in the electric utility market and the existing environment were evaluated, and developments that have occurred in BPA's business practices and policies were considered. The Supplement Analysis found that the BP EIS's relationship-based and policy-level analysis of potential environmental impacts from

BPA's business practices remains valid, and that BPA's current business practices are still consistent with BPA's Market-Driven approach. The BP EIS and ROD thus continue to provide a sound basis for making determinations under NEPA concerning BPA's business-related decisions.

The BP EIS was intended to support a number of decisions (BP EIS, Section 1.4.2), including contract terms BPA will offer for transmission interconnection services. The BP EIS and BP ROD documented a strategy for making these subsequent decisions (BP EIS, Figure 1.4-1 and BP ROD, Figure 3, page 15).

BPA's decision to offer terms for interconnecting the Wind Project is one of these subsequent decisions and the subject of this ROD. BPA reviewed the BP EIS to ensure that offering contract terms for interconnecting the Wind Project was adequately covered within its scope and that it was appropriate to issue a record of decision tiered to the BP ROD. This ROD for the Wind Project, which summarizes and incorporates information from the BP EIS, demonstrates this decision is within the scope of the BP EIS and BP ROD.

This ROD describes the specific project and environmental information applicable to this decision to offer contract terms for transmission interconnection of the Wind Project, with reference to appropriate sections of the BP EIS and BP ROD. This ROD also references information that was incorporated by reference into the BP EIS from BPA's Resource Programs (RP) EIS (DOE/EIS-0162, February 1993). The RP EIS contains an analysis of environmental effects and mitigation for wind projects and associated transmission.

PROJECT DESCRIPTION

BPA Interconnection Facilities

To interconnect the Wind Project, BPA will construct, operate, and maintain a new substation, referred to as the Central Ferry Substation, at a point along BPA's existing Little Goose-Lower Monumental 500-kV transmission lines approximately two miles southeast of the Snake River near the Port of Central Ferry in Garfield County, Washington, and about 15 miles northwest of the City of Pomeroy, Washington. The substation will occupy approximately 25 acres of a 60-acre parcel of land immediately adjacent to the existing right-of-way for the Little Goose-Lower Monumental transmission lines. These transmission lines will be looped into the new Central Ferry Substation. New transmission lines developed by PSE for the Wind Project would deliver power generated by the Wind Project to the Central Ferry Substation.

The BPA Central Ferry Substation will be a 500-kV substation with five breakers, a 500-kV shunt capacitor group, and a 230-kV, 2 breaker ring bus with 3-single phase 500/230-kV transformers. The basic elements of the substation and interconnection facilities will be circuit breakers, disconnect switches, transformers, ground mat, steel structures, electrical equipment, a control house, and miscellaneous other equipment. Communication facilities will include fiber optic facilities on BPA's and the Wind Project's transmission line systems as well as an adjacent microwave tower for use by PSE for communication with centralized system operations. BPA will own all substation facilities.

The Central Ferry Substation will be graveled and, to provide security, lighting and a 7-foot high chain link fence will be installed around the perimeter of the substation. Access to the substation will be from a new access road that PSE will construct as part of the Wind Project to access the Project's turbines, and transmission and communication lines in this area. From an intersection with State Route 127 near Hagen Road, this access road generally will extend northwest to the substation site, approaching the substation from the south.

Lower Snake River Wind Energy Project

A description of the Wind Project is provided in various materials prepared by Garfield and Columbia counties, the siting authorities for the Wind Project, and the Project applicant.[2] The following summary of the Wind Project is based on project information contained in these materials.

The project area for PSE's Wind Project is located in Garfield and Columbia counties near the cities of Pomeroy and Dayton, in the southeast corner of Washington state. This project area, which consists of approximately 124,000 leased acres, has been divided into four individual Wind Resource Areas (WRAs): the 39,900-acre Kuhl Ridge WRA, the 10,000-acre Dutch Flats WRA, the 32,700-acre Oliphant WRA, and the 41,500-acre Tucannon WRA. The Kuhl Ridge and Dutch Flats WRAs are located within Garfield County, the Oliphant Ridge WRA is located in both Garfield and Columbia counties, and the Tucannon WRA is located within Columbia County.

Of the total project area, approximately 600 acres will be permanently disturbed by construction and operation of Wind Project facilities. These facilities include proposed wind turbines and supporting infrastructure such as access roads, underground and overhead electrical collection system lines, substations, transmission lines, communications equipment, operations and maintenance (O&M) facilities, and meteorological towers. An additional 2,750 acres would be temporarily disturbed during project construction by use for temporary construction access and temporary staging areas. Existing agricultural activities, primarily dryland wheat and barley cultivation, will continue on the portions of the project area not permanently occupied by Wind Project facilities.

The Wind Project includes up to 795 wind turbines with a total approximate nameplate capacity of up to 1,432 MW.[3] The portion of the Wind Project located in the Kuhl Ridge WRA will

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[2] *See e.g.*, Blue Sky Wind, LLC and Puget Sound Energy, *Lower Snake River Wind Energy Project: Application for Conditional Use Permit*, January 26, 2009; Garfield County Public Works Department, Planning Division, *Notice of Application, Lower Snake River Wind Energy Project Garfield County CUP #012609*, February 26, 2009; Garfield County Public Works Department, Planning Division, *Determination of Significance and Request for Comments on Scope of EIS*, February 26, 2009; Garfield County (in consultation with Columbia County), *Lower Snake River Wind Energy Project Final Environmental Impact Statement (EIS*), October 2009; Garfield County, *In the Matter of CUP #012609: Findings of Fact, Conclusions of Law, Decision, and Conditions of Approval*, November 25, 2009; Puget Sound Energy, *Lower Snake River Wind Energy Project: Application for Conditional Use Permit*, December 11, 2009.

[3] Although PSE is permitting a 1,432-MW wind facility with Garfield and Columbia counties, PSE has requested interconnection from BPA of only 1,250 MW under Open Access Same-Time Information System (OASIS) Generation Interconnection (GI) request numbers G0284, G0285, G0286, G0294, and G0295. This ROD documents BPA's decision to issue a LGIA for the 1,250 MW of requests. If PSE should seek interconnection of additional

consist of up to 222 turbines generating approximately 400 MW of power. Kuhl Ridge is also where BPA's Central Ferry Substation will be located. The portion of the Wind Project located in the Dutch Flats WRA will consist of up to 83 turbines generating approximately 150 MW. The portion of the Wind Project located in the Oliphant Ridge WRA will consist of up to 204 turbines (139 in Garfield County and 65 in Columbia County) generating approximately 367 MW (250 MW in Garfield County and 117 MW in Columbia County). Finally, the portion of the Wind Project located in the Tucannon WRA will consist of up to 286 turbines generating approximately 520 MW.

Project wind turbines will be located in "strings" generally along ridge tops in the project area to use winds that typically come from the southwest. Each wind turbine will be a typical modern commercial wind turbine model, consisting of a generator, rotor, and blade assembly mounted atop a tubular steel tower on a reinforced concrete foundation. Although a final wind turbine model has not been selected, the CUP from Garfield County allows PSE to use turbines that range from 1.8 to 3.0 MW each. The total height of the 1.8-MW turbine is approximately 410 feet at maximum blade tip height. The total height of a 2.3-MW turbine is approximately 423 feet at maximum blade tip height.

Access to the Wind Project will generally be from U.S. Route 12, State Routes 127 and 261, and a combination of existing private and county roads. During construction, approximately 83 miles of temporary access roads will be installed for construction activities. All temporary roads and disturbance areas will be restored to their original condition after construction. In addition, most existing roads in the Wind Project area will be permanently widened and improved for access during construction and project operation, and approximately 120 miles of new permanent roads will be developed.

Electrical lines will be installed to connect the turbines and strings to the existing high-voltage transmission grid in the area. This electrical system will have three key elements: (1) a collector system, which will collect the lower voltage energy generated by each wind turbine, increase it to 34.5 kV through a pad-mounted transformer, and connect to the project substations; (2) the project substations, which will transform energy from the collector lines (at 34.5 kV) to the transmission level (230 kV); and (3) a 230-kV system that will connect the project substations to the BPA Central Ferry Substation and the FCRTS. Collector lines connecting individual turbines in each string will be located underground, and collector lines connecting the strings with the project substations primarily will be underground with some overhead lines in certain areas. Up to eight project substations will be constructed for the Wind Project, separate from the BPA substation. Each substation will occupy approximately five acres. About 85 miles of 230-kV of overhead transmission lines will deliver electricity from each project substation to the Central Ferry Substation, where the voltage will be stepped up to the 500 kV required for the interconnection to the BPA transmission system. Overhead transmission lines will be supported by H-frame wooden structures, single pole structures, or lattice towers.

megawatts from its project, it would be through a new request under the Open Access Transmission Tariff. BPA would review any such request under NEPA and prepare any necessary NEPA documentation before making a decision regarding the request.

Fiber optic communication lines will also be installed to link each wind turbine to project substations and operations and maintenance (O&M) facilities. These communication lines will allow individual wind turbines and other Wind Project facilities to be monitored and controlled by a Supervisory Control and Data Acquisition (SCADA) system both onsite at the O&M facilities and from remote locations. The fiber optic lines will follow the electrical underground collector system and overhead transmission system.

Up to six O&M facilities will be constructed throughout the project area to serve the Wind Project. Each O&M facility will occupy approximately 2 to 6 acres. The O&M facilities likely will include office space; workshop areas; storage; and kitchen, bathroom, shower and sink facilities. A permanent graveled parking area for employees, visitors, and equipment will be located adjacent to each O&M building.

Rock quarries and temporary concrete batch plants will be established in the project area to supply gravel and concrete for Project construction. Each quarry is anticipated to have a disturbance footprint of less than three acres, and the depth will be determined by the type of rock encountered at each location. Portable rock crushers will be used to create road construction materials and concrete batch plants will be used for mixing concrete.

Temporary staging areas will be utilized throughout the project area to provide temporary storage for turbine parts, other Wind Project components, and temporary employee parking. Each temporary staging area will be approximately 2 to 5 acres. These temporarily disturbed areas will be restored to pre-project conditions following completion of construction.

PSE also will erect up to 11 permanent meteorological towers in the project area to track and monitor wind speed, direction, and temperatures. Each tower will be up to 220 feet tall and consist of a single, non-guyed pole or lattice tower secured by a concrete foundation. These towers may also serve as potential locations for microwave communication equipment.

The Wind Project is expected to be constructed in four or more phases, each lasting approximately twelve months, with the first phase scheduled to begin in Garfield County in 2010. Construction phases may occur solely within a defined WRA or may be comprised of shared facilities and infrastructure within adjacent WRAs. Approximately 250 construction workers will be required for each construction phase. The Wind Project is projected to have a 25-year service life.

PUBLIC PROCESS AND CONSIDERATION OF COMMENTS

Consistent with BPA's strategy for tiering appropriate subsequent decisions to the Business Plan ROD, public processes were conducted for the Wind Project and BPA's proposed interconnection of the Wind Project into BPA's transmission system. Public review processes for PSE's CUP application and other permits provided opportunities for public comment on the Wind Project itself. In particular, Garfield County, in full consultation with Columbia County, conducted a Washington State Environmental Policy Act (SEPA) EIS process under Ch. 43.21C Revised Code of Washington for the entire Wind Project in both counties, which included several opportunities in each county for public review and comment on the Wind Project. Garfield County also conducted public hearings on the CUP application itself. BPA's decision in this ROD concerns whether to allow PSE's proposed interconnection. In making this

decision, BPA considered public comments received through the CUP and associated EIS processes.

For the CUP application and SEPA EIS, Garfield County issued a public Notice of Application and EIS Scoping Notice on February 12, 2009 (revised and reissued February 26, 2009) that described the Wind Project, the EIS process, and invited comments. The revised notice requested written comments by April 3, 2009. Garfield County also held two open-house public-scoping meetings – one on March 4, 2009 in Pomeroy, Garfield County, Washington, and the other on March 5, 2009 in Dayton, Columbia County, Washington – to provide information about the Wind Project and receive comments on the scope of the EIS. Garfield County received 59 comment letters addressing both the CUP application and the scope of environmental review. Most of the comments received during EIS scoping involved concerns about potential impacts to the region's economic resources; potential noise, health, and visual impacts of the proposed Wind Project; potential impacts to agricultural, recreational and hunting uses; effects on wildlife and habitat; and potential traffic impacts from project construction and operation.

After Garfield County published the Draft EIS for the Wind Project in August 2009, it held a 30-day comment period to receive comments on the EIS. During this comment period, Garfield County held open-house public meetings on September 9, 2009 in Pomeroy, Washington and September 10, 2009 in Dayton, Washington. These meetings were held to provide information about the Wind Project, the Draft EIS, and to receive comments on the Draft EIS. Garfield County received 23 comment letters on the Draft EIS, each of which was evaluated and responded to in the Final EIS published on October 7, 2009. One appeal of the Final EIS was filed and later withdrawn.

In addition to the public participation opportunities during the environmental review process, Garfield County mailed, published and posted, in both Garfield and Columbia Counties, advance notice of the November 5, 2009 public open-record hearing on the CUP application and invited another round of written comments on the CUP application. The published notice also informed the public that BPA staff would attend the public hearing and would be available to answer questions about BPA's proposed interconnection.

Garfield County received a total of 44 comment letters on the CUP – 42 letters were in support, and the remaining two letters raised nearly identical objections about the CUP. In addition, 13 people testified at the CUP public hearing – 12 were in support of wind energy development in Garfield and Columbia counties, and 1 person was opposed. Comments raised by this person included concerns about deficient wind speeds in the project area, the incompatibility of wind and agricultural practices, and the calculation of the disturbance area for the turbines that was identified in the EIS.

On November 25, 2009, the Garfield County Hearings Examiner approved issuance of a CUP with conditions that allow PSE to construct and operate the portion of the Wind Project in Garfield County. PSE also has initiated the process for obtaining a CUP from Columbia County for the portion of the Wind Project in that county, and expects to receive this CUP by March 15, 2010.

BPA provided the following specific opportunities for public involvement concerning the proposed interconnection:

- BPA staff attended the March 4, 2009 open-house public-scoping meeting held by Garfield County for the EIS. During this meeting, BPA staff were available to answer questions about the BPA's proposed interconnection.

- On October 16, 2009, BPA sent written notice to adjacent property owners and interested parties describing the proposed interconnection of the Lower Snake River Wind Energy Project into the FCRTS at the new Central Ferry Substation. The notice requested comments on the proposed interconnection by November 16, 2009, and identified several methods by which interested parties could submit comments to BPA.

- BPA posted information about the proposed interconnection at http://www.efw.bpa.gov/environmental_services/Document_Library/Central_Ferry_Substation_Project/, and in BPA's monthly information periodical, the "BPA Journal."

- BPA staff attended the November 5, 2009 CUP public hearing held by Garfield County for the Wind Project. At this hearing, BPA staff gathered information on public comments on the Wind Project, and was available for questions about the proposed interconnection.

Comments from 10 individuals were received by BPA through its public process for the proposed interconnection. The comments from eight of these individuals were supportive of the proposed interconnection, as well as wind energy development in general in Garfield and Columbia counties. The remaining two commenters expressed concern that wind speeds in the project area were not great enough to produce viable power and that construction of a substation would be a waste of taxpayer money. Four comments relating to BPA's Central Ferry Substation were received from Garfield County; all were supportive of the substation project and wind energy development.

ENVIRONMENTAL ANALYSIS

Consistent with the BP ROD, the BP EIS was reviewed to determine whether offering terms to interconnect the Wind Project is adequately covered within its scope. The BP EIS alternatives analyzed a range of marketing actions and response strategies to maintain a market-driven approach. The BP EIS showed that environmental impacts are determined by the responses to BPA's marketing actions, rather than by the actions themselves. These market responses include resource development, resource operation, transmission development and operation, and consumer behavior.

BPA's BP EIS described generating resource types, their generic environmental effects on a per-average-MW (per-aMW) basis, and potential mitigation. The discussion of generic environmental impacts of renewable energy resource development, including wind, is provided in Section 4.3.1 of the BP EIS. The RP EIS also described the environmental effects and potential mitigation associated with the construction or upgrade of transmission facilities to integrate the resources with the existing transmission system (Section 3.5). The per-aMW impacts for wind projects (RP EIS, Table 3-19) were incorporated and updated in the BP EIS (Table 4.3-1). This data was further updated with the preparation of the Supplement Analysis to the BP EIS in April 2007. The BP EIS contains an analysis of generic environmental impacts,

including resource development and operation (Section 4.3.1), and transmission development and operation (Section 4.3.2).

The Market-Driven Alternative anticipated unbundling of products and services, constructing transmission facilities for requests for non-federal power transmission, and providing transmission access to wholesale power producers (Section 2.2.3). The BP EIS also noted that, under the Market-Driven Alternative, new transmission would depend more on generator and other customer requests than on new resource development by BPA (Section 4.2.3.2). Finally, the BP EIS identified the associated need to enhance transmission facilities (Section 4.2.4.1) as one consequence of all new resource development. One example would be customer requests for new transmission line and substation facilities for interconnection of generation resources.

In light of the analyses contained in the BP EIS and RP EIS, interconnection of the Wind Project falls within the scope of the BP EIS. Site-specific impacts that will result from the Wind Project are of the type and magnitude reported in the BP EIS and the RP EIS. The following discussion describes the site-specific environmental impacts that will result from the transmission line interconnection and the Wind Project, and provides additional information on potential cumulative impacts.

BPA Interconnection Facilities Impacts

Land Use and Recreation

The land where the Central Ferry Substation will be constructed currently is used for grazing and dryland farming and is zoned for agricultural purposes. The new substation will occupy about 25 acres, and will remove this acreage from agricultural use. However, most land in Garfield County is zoned for agricultural use, and removing the substation site from agricultural use will have a negligible effect on total county agricultural production. In addition, because the substation will be constructed adjacent to an existing transmission corridor, development of the substation will be consistent with this adjacent use, and the substation does not represent a significant change from current land uses in the area.

Because there are no existing recreational areas in the substation vicinity, the substation will not diminish or affect any recreational opportunities. Hunting does occur in agricultural areas of Garfield County, including potentially in the vicinity of the substation site. Because of its small size, removal of the substation site from potential hunting areas will not appreciably affect the amount of land available for hunting.

Geology and Soils

The Central Ferry Substation site is located on a flat basaltic plateau south of the Snake River and within the Kuhl Ridge area of Garfield County. The substrate is overlain by wind-deposited loess soils. Construction of the new substation will require grading and leveling of the 25-acre substation site. Access to the substation will be from a PSE turbine and transmission line road terminating at the Central Ferry Substation. BPA will require site-specific erosion and sediment controls for soil stabilization through the use of best management practices (BMPs) and other safety measures to avoid spills and releases of hazardous materials into the soil. To reduce disturbance to soils and vegetation, vehicle use will be restricted to access roads and immediate

work areas. Access road drainage structures will be kept functional and the road surface will be maintained to minimize erosion, run-off, and sedimentation.

Vegetation

Vegetation at and around the substation site is predominantly comprised of winter wheat and disturbed annual grasslands with no trees or shrubs present. Approximately 25 acres will be permanently disturbed from construction of the substation. Any cleared or disturbed areas outside of the permanent substation footprint will be reseeded with a seed mix specified by the landowner after construction. There are no federally listed endangered, threatened, or candidate species known to occur at the substation site.

Wetlands and Water Resources

The Central Ferry Substation site is in an arid region with hot, dry, summers and cold winters. The substation site is an upland location with no wetlands or other water resources that will be impacted by construction or operation of the substation.

Fish and Wildlife

No aquatic or riparian habitats exist at the substation site and no fish are present. Development of the substation site therefore will not affect any fish species. Small numbers of mammals such as mice, voles, rabbits, as well as larger mammals including coyote, elk, mule deer, and white-tail deer may occasionally occupy or pass through the site. These mammals may be displaced by development of the substation site, but given the abundance of similar habitat in the area, it is expected that any such species will relocate to these other habitat areas. If any small burrowing mammal species such as mice and voles with burrows at the substation site are present during project construction, some individuals may be killed as a result of excavation. There are no trees or shrubs to support arboreal nesting activities. There are no federally listed endangered, threatened, or candidate species known to occur at the substation site.

Historical and Archaeological Resources

Under Section 106 of the National Historic Preservation Act, BPA consulted with the Washington Department of Archaeological and Historic Preservation (DAHP), the Yakama Indian Nation, the Confederated Tribes of the Colville Reservation, the Nez Perce Tribe, the Confederated Tribes of the Umatilla Indian Reservation, the Wanapum Tribe, the Coeur d'Alene Tribe, and the Spokane Tribe of Indians concerning potential effects to cultural resources and historic properties at the substation site.

Background research indicated that there are no recorded archaeological resources located within the proposed substation site. A pedestrian survey was conducted in April 2009 which resulted in the identification of one cultural resource at the substation site. This resource consists of one historic period site. Considering the relative age of the artifacts at this site, it appears to represent episodes of equipment abandoning or dysfunctional agricultural equipment. The site is not recommended for listing on the National Register of Historic Places (NRHP) because of the commonality of the artifacts in an agricultural landscape that has been farmed for several decades. Based on the results of the background research and field survey, it is BPA's determination that no historic properties will be affected as a result of the proposed project.

DAHP concurred with this finding on June 23, 2009. If any cultural resources are uncovered during substation construction, work will immediately cease and BPA, state archeologists, and tribes will be notified to ensure proper procedures are implemented to protect the site until it is properly assessed.

Visual Resources

The vicinity of the substation site is undeveloped, with the exception of the existing BPA high-voltage transmission line corridor immediately to the north of the site. The new substation likely will be visible to varying degrees from State Route 127 and some private roads. However, the substation will not greatly alter existing visual resources in the area because it will be next to the existing transmission lines. Impact to visual resources will be minimal.

Noise

Substation construction noise will be generated by construction equipment, excavation and grading activities, and facility construction. Construction will begin on the substation in late spring 2010 and will be completed in fall 2011. Construction crews will work 8- to 12-hour days during daylight hours as needed to meet the project construction schedule. Increased noise levels from construction will be temporary and will cease once substation construction is complete.

Routine substation operations and maintenance activities that cause noise will occur after construction is complete and the substation is operational. When the switches or breakers in the substation are operated, they create a brief, loud burst of noise, similar to the type of noise caused by a gunshot. This noise will occur infrequently. The disconnect switches will automatically operate when there is a problem with a transmission line to prevent equipment from being damaged and as part of the maintenance of the line, such as when there is a need to repair or replace insulators damaged by vandals or hunters. Each single-phase transformer will produce about 70 dBA of noise during operation. This noise would be similar to the sound produced by a gas lawnmower from 100 feet away. The nearest residential structure is approximately 1 mile away, and is not likely to be impacted by substation noise.

Public Health and Safety

During substation construction, access to the site will be limited to authorized personnel and the general public will be excluded. In order to prevent unauthorized public access during operation, the new substation will be fenced and lighted. In addition, the substation will be locked and accessible only by authorized personnel.

During construction, BPA will use standard construction safety procedures to reduce the risk of fire. BPA will use standard industry traffic controls to inform motorists and manage traffic during construction activities. BPA also requires that the construction contractor develop an emergency response plan that includes responding to a potential accidental fire during construction. All equipment fueling operations will use pumps and funnels and absorbent pads. A supply of sorbent materials will be maintained on-site in the event of a spill. Response measures and procedures will be put in place in case of an accidental release of petroleum products and/or hazardous substances. BPA's Pollution Prevention & Abatement (PPA) Program will create an environmental requirements document that will guide construction

personnel. A member of the PPA staff is assigned to the project, and will be notified immediately in the event of any hazardous material spill.

Except for fuel and oil used in construction equipment, no combustible materials will be used; therefore, increased risk of fire and explosion is unlikely. Minimal new toxic substances or hazardous waste (small amounts of lubricants and solvents) will be introduced. BMPs will be employed to reduce or control the potential for environmental health hazards.

Socioeconomics and Public Services

Substation construction is expected to take one to two years to complete. No increase in public services is anticipated from the construction and operation of the substation because of the low level of human activities at the site. During construction, indirect economic benefits will accrue to businesses in the general vicinity from construction workers in the area purchasing goods and services.

Air Quality

Small amounts of dust will be temporarily created by excavation activities during construction of the substation, especially during dry, windy weather. BPA requires that the construction contractor develop and implement a suitable dust abatement plan to control and minimize dust. BMPs, including using water for dust control; proper storage of disturbed soils; minimizing the amount of disturbed soil at any given time; and restoration seeding of disturbed areas will be used. Construction and maintenance vehicles and equipment will be in good running condition, minimizing emissions. Water trucks will be used for dust control. No water will be withdrawn from any stream, ditch, or water body in the project area unless approved.

Transportation

The substation site is located directly west of State Route 127, approximately 7 miles north of the intersection of State Route 127 and US Route 12. Construction vehicles for the substation will use the turbine and transmission line access road constructed by PSE which will be accessed using a combination of US Route 12, State Route 127, and existing private and county roads. Construction activities may temporarily increase traffic on roads in and around the project area. BPA will use standard industry traffic controls to inform motorists and manage traffic during construction. Short-term traffic delays on State Route 127 and local roads may occur; construction impacts to transportation will be temporary and minimal. After construction, occasional maintenance trucks and other vehicles will need to use local roads.

Wind Project Impacts

The following summary of environmental impacts is based on information contained in the *Lower Snake River Wind Energy Project Final EIS* (Garfield County in consultation with Columbia County, October 2009).

Land Use and Recreation

The project area for the Wind Project is characterized by rolling rural landscape, dominated by agricultural areas of principally dry land wheat and rye, with some livestock grazing. Coordination with landowners in the project area for locations for new project roads will enable

farming to continue on most land currently in agricultural production. Co-location of collector lines in parallel trenches and along or under new roads, as feasible, will further minimize the permanent disturbance of agricultural lands. The Wind Project is compatible with the adjacent agricultural land uses, and will not result in a significant change in accepted farm practices.

The Wind Project will permanently disturb approximately 600 acres of agricultural land, with about 343 acres of this disturbance occurring in Garfield County and the remainder in Columbia County. The 343 acres of permanent disturbance in the portion of the project area located in Garfield County represents approximately 0.16% of the agricultural land within this portion The remainder of permanent disturbance that will occur in the portion of the project area located in Columbia County represents approximately 0.14% of the agricultural land within this portion. Accordingly, the Wind Project will permanently disturb an extremely small percentage of agricultural land in the project area, and an even smaller percentage of agricultural land in the two-county area.

Of the approximately 600 acres permanently disturbed by the Wind Project, about 559 acres have been classified by the National Resource Conservation Service (NRCS) as prime farmland. Prime farmlands are lands that the NRCS has determined have the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. Within the entire project area, a total of approximately 10,110 acres have been classified as prime farmland. Accordingly, the Wind Project will permanently disturb about 5.5% of the prime farmland in the project area, which is an insignificant impact to prime farmland within the project area alone, and an even smaller impact on such farmlands in the two-county area.

The Wind Project is not located within any protected areas. There are no designated recreational facilities within the project area, but four landowners within the project area are part of Washington Department of Fish and Wildlife's (WDFW) private lands access programs. Three of these landowners participate in the "Feel Free to Hunt" program in which the public is allowed access to private lands for hunting purposes. PSE operates successful hunt by permission programs at its two other Washington wind power facilities, and is committed to operating the same type of hunt by permission program at this Wind Project.

Geology and Soils

The Wind Project site lies within the Blue Mountains province, a sub-province of the Columbia Basin Plateau. The geology of the area is older volcanic rock overlain by the Columbia River Basalt group, comprised of younger sedimentary and volcanic units. Topography at all four WRAs is primarily plateaus and incised streams, with few periodic basaltic outcrops and cliffs. The project area is rated as having a low incidence of and susceptibility to landslides or mass movements. Project facilities will not be located on unstable slopes or slide-prone areas. The Wind Project will incorporate into its final engineering any applicable performance standards for geologically hazardous areas as specified in the respective counties' Critical Areas Ordinances (CAOs).

The soils in the project area include silt loams overlying basalt bedrock with isolated rock outcrops. The soils are generally deep and well–drained and were formed in loess deposits. Areas with steep slopes that are cleared of vegetation present erosion concerns during storm events and high wind events. Construction of the Wind Project will include removal of surface vegetation and grading and leveling operations. In addition, the use of large and heavy

equipment will temporarily increase the potential for soil erosion. Trenching activities could also contribute to erosion risk. Soil erosion and offsite sedimentation will be controlled through implementation of erosion control measures to reduce unnecessary impacts and to comply with applicable regulations. BMPs will be identified in the Wind Project's Construction Storm Water Pollution Prevention Plan (SWPPP) and in a National Pollution Discharge Elimination System (NPDES) permit to be implemented for the Wind Project.

Heavy equipment and frequent traffic could cause soil compaction and/or rutting on sensitive soils. Project area soils are silt loam, some with high rock components, and are moderately susceptive to soil compaction. The risk of significant soil compaction from the Wind Project is moderate if soils are moist, and low if construction occurs when soils are drier. Additionally, soil contamination as a result of spills or leaks of lubricants and fuels used in the construction process may also occur. Flammable and hazardous materials will be managed in accordance with Occupational Safety and Health Administration and state requirements, and implemented through the Wind Project's Emergency Action Plan.

Post-construction operations of the Wind Project will have little impact on soils. Precipitation will result in surface water collecting on structures and concrete or graveled surfaces, and drainage from those areas could erode nearby soils. Repair and maintenance activities could expose soils to erosion.

Vegetation

Prior to modification by human activities, the region within the Wind Project area was dominated by sagebrush steppe, comprised of sagebrush or shadscale interspersed with short bunch grasses, including Idaho fescue, bluebunch wheatgrass, and Sandberg bluegrass. These dominant shrubs are replaced by greasewood in more mesic, alkaline flats. More mesic upland areas in the Columbia River Basin give way to open cover dominated by the bunchgrasses. Stream corridors are lined with willows, other riparian shrubs such as snowberry and Wood's rose, and herbaceous, sedge-dominated wetlands.

The historic land cover of sagebrush steppe and bunchgrass grasslands in the project area has been substantially modified and replaced by human activities. The majority of the project area is now dominated by agricultural fields that bear no resemblance to the original vegetation cover, the original plant species diversity, and the original ecological function of the unmodified native plant communities. Other modified plant communities include those under cultivation as Conservation Reserve Program (CRP) lands, and those dominated by annual weeds. Small remnant areas of native bunchgrass grassland, sagebrush steppe, and riparian areas with associated wetlands also occur throughout the area.

No known populations of endangered, threatened, or candidate species listed by the U.S. Fish and Wildlife Service (USFWS) receiving regulatory protection under the Endangered Species Act (ESA) are known to occur in the project area. The project area contains potential habitat that could support one threatened species, the Spalding's catchfly (*Silene spladingii*). Surveys for this species were conducted in suitable potential habitat within the project area in July and August 2009, and no populations were located. No special-status plant species occur within the project area.

The Wind Project will have a temporary impact on approximately 2,750 acres, and a permanent impact on approximately 600 acres, consisting predominantly of Class IV/croplands, pasture, urban and mixed environments and a minor amount of Class II shrub-steppe and Class III/eastside interior (native vegetative) grasslands and CRP. The WDFW Wind Power Siting Guidelines' mitigation ratios for each type of habitat loss will be utilized to mitigate such losses. A noxious weed management and revegetation plan will also be developed in consultation with the respective county weed management authorities.

Wetlands and Water Resources

A total of 23 wetland areas have been identified within the project area. Twelve wetlands ranging from seven to 1,598 square feet each occur in the Tucannon WRA. Six wetlands ranging from 0.126 to 2,791 square feet each occur in the Dutch Flats WRA. Five wetlands ranging from 67 to 553 square feet each occur in the Kuhl Ridge WRA. No wetlands occur in the Oliphant WRA. To the extent possible, the majority of clearing and grading activities within the project area will be at least 200 feet from all wetlands, which exceeds all required buffer widths under the Garfield County Critical Areas Ordinance (CAO) and all but the Category I wetland buffers under the Columbia County CAO. No category I wetlands occur in the project area. If Wind Project facilities are located within stream buffers, they will be designed and constructed in accordance with the applicable CAO.

The Wind Project is located within several federally defined watersheds, including the Pataha Creek watershed, the Upper and Lower Tucannon River watersheds, the Deadman Creek watershed, and the Snake River/Penawawa Creek watershed. All four Project WRAs are within the State of Washington-classified Middle Snake River Watershed, Water Resource Inventory Area (WRIA) 35. At its closest point to the Wind Project, the Snake River is approximately 1.2 miles north-northwest of the Kuhl Ridge WRA.

Precipitation, runoff, and direct groundwater discharge are the sources of water to surface water bodies in the WRAs. Fish and wildlife depend on adequate water, as do many recreational activities. Surface water bodies, such as lakes, rivers, ponds, and streams, are regulated by Washington State to ensure sufficient water of sufficient quality is present for both fish habitat and recreational activities . Water quality data for the watersheds indicates that temperature and sediment are the primary issues affecting aquatic habitat. Fecal coliform has been identified as a source of degraded drinking water quality.

Storm water runoff potential will be greatest during construction of the Wind Project when large quantities of soil will be disturbed during construction of roads, turbine foundations, and other project facilities. Precipitation during construction can result in stormwater runoff, which exacerbates the rates of erosion and sedimentation.

The Wind Project's final design will incorporate several elements of mitigation, including adhering to stream buffers to the fullest extent possible, culverting of streams to facilitate road crossings, avoiding surface waters, and designing and implementing BMPs in compliance with Washington Department of Ecology's Stormwater management manual for Eastern Washington. Both Columbia and Garfield Counties have adopted this manual as their stormwater guidelines. Point and non-point stormwater discharges will be managed in accordance with a SWPPP and through a NPDES permit for stormwater discharges.

Groundwater in the Wind Project area occurs in two principal aquifer systems: the suprabasalt sediment aquifer system and the underlying Columbia River Basalt Group aquifer system. Groundwater well depth in Garfield County can vary from less than 100 feet to almost 1,000 feet below the surface. Columbia County wells evidence a range of well depths from 50 to 2,000 feet below the surface. In Columbia County, the City of Dayton is the only population center served by a public water system. In Garfield County, the City of Pomeroy uses aquifers and springs as its drinking water sources. Several protections exist under the Safe Drinking Water Act for groundwater resources that are drinking water sources, including protections for sole-source aquifers. There are no sole-source aquifers within the Wind Project area.

Water for Project construction activities will not be obtained from groundwater resources in the Project area, but will be transported to the site from local providers in accordance with applicable state rules and regulations. Groundwater quality could be degraded through infiltration of stormwater runoff and also from fuel or chemical spills during construction activities. If groundwater is encountered during excavation and construction activities and dewatering is required, the water generated from dewatering will be discharged to upland areas, allowing distribution of the water over a large surface area to facilitate evaporation and/or infiltration. Additional measures will be used as necessary to avoid transport of silt into adjacent fields.

Several project features will be located within the wellhead protection areas in the Dutch Flats WRA. Groundwater contamination will be minimized through mitigation measures specified in the SWPPP. Garfield County's CAO also imposes additional steps, including a Site Assessment Report that must be prepared to map the locations of known wells and receptors.

Construction of new roads and alterations of existing roads may result in changes to several natural drainage courses in the project area. Culverts may be installed to facilitate road crossings, and installation of overhead 230-kV transmission lines will require riparian crossings. BMPs will be developed and imposed, and siting of all O&M facilities, turbines, and roads will occur 250 feet from fish-bearing streams to the extent possible. If Wind Project facilities must be located within stream buffers, they will be designed and constructed in accordance with applicable county CAOs.

Fish and Wildlife

Fish Species

The Wind Project is located in the Middle Snake River Watershed. Within the Project boundary there are four fish-bearing streams: Tucannon River and its tributary, Pataha Creek, as well as Meadow Creek and Brown Gulch. All four are considered major salmonid habitat. Eight fish with federal and/or state status have been identified by the USFWS, National Marine Fisheries Service (NMFS), and/or Washington Department of Fish and Wildlife (WDFW) as having the potential to occur in or adjacent to the Wind Project. Of these eight species, three species, bull trout, spring/summer and fall runs of Chinook salmon, and steelhead, are federally listed threatened species, and as such are currently protected under the federal ESA.

The Tucannon River, which runs along Tucannon WRA's northeastern boundary and Oliphant Ridge WRA's southern boundary, is used by all three federally listed species for spawning and rearing. In addition, WDFW operates a salmon, steelhead, and rainbow trout hatchery south of the Wind Project near Rainbow Lake. Fish from this hatchery use the Tucannon River in and

near the Wind Project area. Pacific lamprey have also been documented in the Tucannon River. River lamprey may occur in this river as well, although their presence has not been documented.

Pataha Creek runs through the southern portion of the Kuhl Ridge WRA and northern portion of the Oliphant Ridge WRA. This stream supports steelhead in the upper reaches, native and planted rainbow trout in the mid to upper reaches, as well as redband trout and eastern brook trout throughout the river. Suckers, northern pikeminnow, and shiners inhabit the lower portion of Pataha Creek.

Summer steelhead and rainbow trout have been documented in Meadow Creek, which runs through the northeastern corner of the Kuhl Ridge WRA. One fish-bearing stream, Brown Gulch, is in the Dutch Flats WRA. This stream contains rainbow trout.

Potential impacts on fish or aquatic habitat associated with construction of the Wind Project include changes to water quality and water quantity. Construction of the Wind Project has the potential to affect fish-bearing waters primarily through indirect impacts from soil exposure leading to erosion and sedimentation, or direct impacts to fish bearing streams. Stormwater runoff potential will be the greatest during construction, when large quantities of soil will be disturbed during construction of roads, turbine foundations, and other Wind Project facilities. Precipitation during construction can cause increased stormwater runoff, which exacerbates the rates of erosion and sedimentation. Sediment often carries organic matter, nutrients, such as phosphorus, and chemicals, all of which can impact the water quality of a stream. If nutrients are bound to the sediment particles, a decrease in dissolved oxygen levels in the stream may result, leading to adverse impact to aquatic life.

Construction of roadways and/or culverts also has the potential to affect fish and aquatic habitats in the Wind Project area by eliminating, diverting, or otherwise impeding flow of onsite waterways. Construction of new roads could also result in habitat impacts associated with three unnamed streams. As currently proposed, no Wind Project facility except road crossings, to the extent possible, will be located closer than 250 feet from the onsite fish-bearing streams.

Installation of overhead 230-kV transmission lines will include crossings of Pataha Creek and several unnamed streams. Collector lines will be installed parallel to the road system, where possible. Trenching during installation of these lines will occur outside the 250-foot buffer of the Tucannon River to the extent possible to avoid degrading this fish-bearing stream.

Implementation of BMPs includes measures to reduce erosion and includes setbacks from fish-bearing streams, which will be implemented where possible. The number of stream crossings will be minimized to the extent possible, and roadways will stay 250 feet from the banks of fish bearing streams. Where avoidance of the riparian corridor is not possible, stabilized rock construction or other similarly environmentally sensitive access roads will be used. If Wind Project facilities must be located within stream buffers, they will be designed and constructed in accordance with the applicable CAOs.

Terrestrial wildlife species

No federal- or state-listed threatened, endangered, or proposed wildlife species have been observed in the Wind Project area. Species lists provided by the USFWS indicate two federally listed species, gray wolf and Canadian lynx as occurring in Garfield and Columbia counties.

Gray wolf is listed as endangered while the lynx is listed as threatened under the federal ESA. Washington State also lists the gray wolf and lynx as endangered and threatened, respectively. Based on the lack of gray wolf habitat and the continued presence of human activity in the region, this species is unlikely to occur in the Wind Project area. Although listed by USFWS as occurring in both Garfield and Columbia Counties, lynx are primarily found in high-elevation forests or north central and northeast Washington, including Okanogan, Chelan, Ferry, Stevens and Pend Oreille counties. Based on the habitat attributes present in the Wind Project area and the habitats with which this species is associated, it is unlikely this species occurs in the project area.

Big game species documented to occur throughout the Wind Project area include elk, mule deer, moose and white–tailed deer. Winter range habitat for elk, mule deer and white-tailed deer has been designated by WDFW in the Wind Project area. These areas are considered Fish and Wildlife Habitat Conservation Areas under both counties' CAOs. Other general wildlife species that may occur throughout the Wind Project area include badger, coyote, porcupines red fox, rabbits, voles, and mice. Several species of reptiles are also present including the northern pacific rattlesnake, western yellow-bellied racer, and gopher snake.

The potential direct wildlife impacts from Wind Project construction include temporary and permanent loss of habitat, and inadvertent mortality to individual species. During the construction period, it is expected that big game species may be temporarily displaced from the Wind Project site due to the influx of humans, heavy construction equipment, and associated disturbance. Studies involving big game species have shown little to no evidence of foraging disturbance during construction of wind farms. Construction of the Wind Project may also affect other wildlife in the project area including badger, coyote, and other small mammals such as rabbits, voles and mice. Direct impacts to these mammals may include unintentional mortality or injuries of individuals occurring in construction zones. Permanent indirect impacts will include the loss of habitat. Road and facility construction could result in loss of foraging and breeding habitat for small mammals. Ground-dwelling mammals will lose the use of the permanently disturbed areas; however, they are expected to repopulate the temporarily impacted areas.

It is likely that wildlife species will become accustomed to the presence of Wind Project facilities and are unlikely to be permanently displaced. There is potential for indirect impacts to occur to big game as a result of this Wind Project. With the development of roads to access the strings of turbines there is a potential for elk and mule deer to shift their migration routes to avoid them. Road avoidance is typically greater where roads are more traveled. Human-related activity at wind turbines during regular maintenance will be relatively infrequent, and it is unlikely that the tolerance threshold for elk will be exceeded during regular maintenance activities.

No loss of habitat to big game species will likely result from the Wind Project, which will occur primarily in dry land agricultural fields that provide little good cover. Mule deer and white tails using the riparian areas will not be disturbed by operations, as the riparian areas are low lying areas while turbines and the majority of roads will be located along adjacent ridge tops.

Avian Species

Avian species observed in the project area during project surveys, either during fixed-point surveys, raptor nest surveys, or incidentally, included primarily passerine and raptor species.

Avian species observed during the surveys are known to occupy and/or breed in similar habitats in Washington and are generally common and widespread in Eastern Washington. Passerines had the highest use by any bird type during all four seasons. The most common birds observed during project surveys include horned lark , European starling, common raven, rock pigeon, red-tailed hawk, American goldfinch, and western meadowlark. Raptor species observed during these surveys, in addition to red-tailed hawk, include American kestrel, Northern harrier, sharp-shinned hawk, Swainson's hawk, bald eagle, golden eagle, and osprey. Owl species observed include Great-horned owl, short-eared owl and barn owl, but these species have relatively low use (less than 1 percent of overall bird use) of the project area.

No Federal threatened, endangered, or proposed avian species were observed in the project area during fixed-point surveys, raptor nest surveys, or incidentally. One state threatened species, ferruginous hawk, was observed, as was one state sensitive species, bald eagle. In addition, five state candidates for listing were observed: golden eagle, Vaux's swift, vesper sparrow, merlin, and sage thrasher. Most observations of these species (70.9%) occurred in the Oliphant WRA.

The WDFW also maintains a list of State monitored species. These monitored species are not considered species of concern by the WDFW, but are managed as required to prevent these species from being listed as endangered, threatened, or sensitive. Seven monitored species were observed in the project area: Swainson's hawk, osprey, grasshopper sparrow, great blue heron, western bluebird, prairie falcon, and turkey vulture. Most observations of these species (44.9%) occurred in the Tucannon WRA.

The project area also was surveyed for raptor nests. These surveys found 50 red-tailed hawk nests, 10 great-horned owl nests, three Swainson's hawk nests, and one barn owl nest within the project area. Additionally two golden eagle nests and one prairie falcon nest were found in a 2-mile buffer area surrounding the project area. The density of raptor nests found in the project area is similar to the nest density for other nearby wind-energy facilities that have been studied in the Oregon-Washington region. The project area's raptor nest density appears to be primarily influenced by the proximity of several tributaries to the Snake River (e.g., the Tucannon River, Pataha Creek), which have good raptor nesting habitat in the form of large cottonwood trees and rock cliffs lining the valley. There are also some raptor nests observed in isolated trees located in the steep draws, which led from the flat agricultural areas on top of the ridges down towards the rivers.

Passerines have been the most abundant avian fatality at other wind projects studied, often comprising more than 80% of the avian fatalities. Both migrant and resident passerine fatalities have been observed. Given that passerines make up the vast majority of the avian observations onsite, it is expected that passerines will make up the largest proportion of avian fatalities at the Project site. Species most common to the study area, including western meadowlark, European starling, and horned lark, would likely be most at risk. Horned larks have been the most commonly observed fatality at several other wind projects. Nocturnal migrating passerine species may also be affected, but it is not expected that they would be found in large numbers based on data collected at other wind power projects (i.e., no large mortality events documented). Based on the per turbine mortality estimates from other wind power projects studied, between 0.8 to 2.4 passerine fatalities per MW may occur per year, which equates to about 1,150 to 3,400 fatalities per year for the Wind Project as a whole.

Based on raptor use estimates in the project area, potential raptor mortality associated with the proposed project is estimated at about 0.09 raptor fatalities per MW year. Based on this assumption, an average of nine raptor fatalities could occur per year for each 100 MW of wind-energy, which equates to up to 130 fatalities per year for the Wind Project as a whole. Based on the raptor survey results, the majority of raptor fatalities are expected to be red-tailed hawks.

Potential impacts to nesting raptors include direct loss of nests, disturbance of nesting habitat by construction, and potential disturbance or displacement effects if construction of facilities occur in close proximity to nests. Because the majority of nests in the Wind Project area are located in riparian corridors and drainages, and proposed facilities are placed on agricultural areas on the ridge tops, there is little potential for direct loss or take of a raptor nest. Red-tailed hawk and great-horned owl, the most abundant nesting raptors in the study area, are the species at highest risk to disturbance or displacement effects from construction activity. The two golden eagle nests located during the survey are unlikely to be affected by the construction or operation of the proposed facility, as they were both located in the buffer zone for the survey and greater than 0.5 mile from the proposed facility areas.

Bat Species

At least two species of bats, hoary bat and silver-haired bat, are known to migrate through Washington. Other species, such as little-brown bat and big-brown bat, may make localized short-distance migrations to suitable hibernacula sites (e.g., caves, mines). Bat acoustic surveys conducted for the Wind Project were unable to determine precise bat species present in the project area, but were able to distinguish high-frequency bat species (such as Western pipistrelle and mouse-eared bat) from low-frequency species (such as the silver-haired bat), as well as hoary bats from other bat species.

Roughly two-thirds of passes recording during project surveys were by high-frequency bats, suggesting higher relative abundance of species such as Western pipistrelle and mouse-eared bat. Hoary bats comprised 2.2% of the total passes detected within the study area. Bat activity within the project area was lower than bat activity observed at facilities in Minnesota and Wyoming where bat mortality was relatively low; and much lower than activity recorded at facilities in West Virginia, Iowa, and Tennessee, where bat mortality rates were relatively high. Overall, the project area is not located near any known bat colonies or other features that are likely to attract large numbers of bats, but certain areas, such as riparian corridors, likely receive higher bat use. The project area does not appear to contain topographic features that would funnel migrating bats, and it lacks forest cover present at the high mortality sites in the eastern United States. Based on the presumed relationship between existing bat activity and post-construction fatalities, bat mortality from the Wind Project is expected to be relatively low and likely to be similar to the average for other wind energy facilities within the Columbia Plateau Ecoregion.

Nevertheless, some bat fatalities will likely occur from Wind Project operations. Bat research at other wind power projects indicates that bat species are at some risk of collision with wind turbines. Wind power project studies indicate that most bat fatalities occur during migration, with low mortality associated with resident bat species. Most bat species in Washington migrate south in the fall. Washington bat species that do not migrate are year-round residents that hibernate in the winter. Mortality is likely to consist primarily of hoary bats and silver-haired bats and likely to be highest during the months of August and September. Minor impacts are

expected to other species (e.g., little-brown and big-brown bats) during the spring and early summer.

Historic/Archeological Resources

Background research conducted within the Wind Project's Area of Potential Effect (APE) identified one archaeological site within the Tucannon WRA. This archaeological site will not be impacted because it is not located where ground disturbance will occur. The Dutch Flats WRA also was identified as being adjacent to the Downtown Pomeroy Historic District. Indirect impacts to the Pomeroy Historic District could result from visual changes to the setting of the district. The district was listed on the National Register of Historic Places (NRHP) in 2003 as an intact collection of commercial buildings that demonstrate the dominant architectural styles and building methods. The listing was not based on the setting of the district. The Pomeroy Historic District has reviewed the proposed Wind Project layout and has determined that the county's setback requirements are sufficient to mitigate perception of "looming" towers and blades along the ridges bordering the northern and southern boundaries of the district. Therefore, there will be no impact to the continued NHRP eligibility of the Pomeroy Historic District.

A pedestrian cultural resources survey will be conducted within the APE prior to any ground disturbance associated with the Wind Project. The final cultural resources survey report will be provided to DAHP and affected Tribes. The APE is approximately 28,556 acres and includes the Wind Project's environmental permitting corridors, which contain the proposed wind turbine strings, access roads, utility lines, borrow pits, laydown and staging areas, and other associated infrastructure. Included in the APE are viewshed impacts assessed within an area approximately 1.5 miles from the proposed turbine strings.

Avoidance of archaeological sites is the preferred method of mitigation. Resources that cannot be avoided will be evaluated for eligibility for listing on the NRHP. Concurrence from the DAHP on the eligibility of any resource that may be impacted will be obtained prior to any site disturbance. A cultural resources sensitivity training for personnel working on Wind Project construction will be conducted. The purpose of this training will be to instruct Wind Project personnel on the sensitivity of cultural resources in the project area. Individuals from the Confederate Tribes of the Umatilla Indian Reservation (CTUIR), the Nez Perce, and DAHP will be invited to contribute to this training.

Impacts to cultural resources could occur as a result of inadvertent discovery of resources during construction. PSE, in consultation with DAHP and affected Tribes, will prepare a Cultural Resources Monitoring, Mitigation and Inadvertent Discovery Plan prior to beginning any earth moving activities for the Wind Project.

Visual Resources

During construction, large earth-moving equipment, trucks, cranes, and other heavy equipment will be highly visible from nearby areas. At some times, small, localized clouds of dust created by road building and other grading activities may be visible at the site. Because of construction-related grading activities, areas of exposed soil and fresh gravel that contrast with the colors of the surrounding undisturbed landscape will be visible. In close-up views, particularly those seen by travelers on US Route 12 and State Route 127 that pass through the project site and those seen

from the closest residences, the visual changes associated with the construction activities will be highly visible and will have a moderate to high visual impact.

The Wind Project has the potential to create high levels of visual impact from some locations. Numerous turbines will be visible from various locations throughout the region. PSE conducted extensive visual analyses, including visual simulations of the Wind Project. In order to minimize visual impacts, turbine setbacks from rural residences in the project vicinity will be a minimum of one-quarter mile from property boundaries in Columbia County and one quarter-mile or four times the total extended height of the turbines, whichever is greater, from residences in Garfield County.

Noise

The Wind Project area is mostly undeveloped hilly terrain with low population density; Garfield County has the lowest population of all 39 counties in the state of Washington, as well as the lowest density, with Columbia County close behind at 36 out of 39 counties. Of the sparse houses in the vicinity of the project's turbine strings, nearly all are owned by project participating landowners. Distances range from approximately 1,350 to 5,280 feet from the closest wind turbine. The primary source of noise in the project area is wind and vehicular traffic along local roads and highways that bisect the project area.

During the construction of the Wind Project, noise from construction activities will add to the noise environment in the immediate area. Construction of the wind project will cause localized increases in noise that will have an intermittent and short-duration effect on nearby residences. These temporarily increased noise levels will result from normal construction activities and construction equipment, such as bulldozers, graders, and excavation equipment. Blasting, rock quarry activities, and increased traffic will also generate noise during the construction phase.

Due to the remote, hilly nature of the project area, construction noise effects will be largely attenuated. Final turbine locations will be established through the micrositing process during which noise emissions from the Wind Project will be further assessed and factored into final Project design. The Wind Project will comply with the 70 decibels measured on the A-weighted scale (dBA) noise emission standard at the property line of adjacent agricultural property and residences. It will also comply with the 50 dBA noise emission standard at existing non-participating landowners' residential structures through appropriate turbine siting, provided that individual landowners may, by contract, agree that PSE may exceed these limits on their property.

Applying setbacks required by the Garfield County Zoning Ordinance, the minimum setback of a turbine from a residence will need to be 1,640 feet. It is anticipated that a noise level of 50 dBA will be achieved within approximately 1,500 feet from a string of turbines. The noise level would be diminished even further at 1,640 feet. The Garfield and Columbia county zoning setbacks are expected to mitigate noise impacts to meet state standards and the more stringent standard voluntarily imposed on Wind Project design by PSE.

Public Health and Safety

The Wind Project will have fencing around substations and other electrical equipment. Turbine generating equipment will be high above ground, and access to turbine towers will be

secured and limited to authorized personnel. The collector system will be located at least three feet below ground.

During construction, access to the site will be limited to authorized personnel and the general public will be excluded. Authorized visitors will be required to check in with security and construction personnel will be diligent in identifying and excluding non-authorized visitors. During operation, all electrical components, such as substations and turbines, will be locked and accessible only by authorized personnel.

Health and safety risks during construction include potential fire or explosion, and release of hazardous materials to the environment. Health and safety risks during project operation include these risks as well as others specific to wind turbine generators such as ice throw, tower collapse, blade throw, and shadow-flicker. None of these public health and safety risks are expected to be substantial threats. However, PSE will institute a number of mitigation measures designed to avoid and minimize risk through compliance with all applicable local, state, and federal safety, health, and environmental laws, ordinances, regulations, and standards. Accordingly, PSE will put in place a large number of measures to reduce the risk of fire, explosion, the release of hazardous materials, ice throw from rotating turbine blades, turbine tower collapse, shadow flicker from rotating blades, dust hazards, vandalism, electric and magnetic field hazards, and electrical shock hazards.

Socioeconomics and Public Services

The Wind Project will have beneficial economic consequences that offset the cost of impacts to public services. The Wind Project will employ up to 250 people per construction phase, and will also create between 70 and 90 permanent family-wage jobs. Annual lease payments to the landowners in the wind facility lease area will supplement income from other farm operations without significantly reducing the land base available for farming practices. In addition, the Wind Project is expected to provide between $0.8 million to $4 million per year in property tax revenue to Columbia County over the life of the project and between $0.9 and $4.5 million per year in property tax revenue to Garfield County over the life of the project. Revenues to private businesses also will increase both during construction and the operation of the Wind Project.

The Wind Project will not cause any significant adverse impact on the ability of communities in the local area to provide services such as housing, health care, schools, police and fire protection, water and sewer, solid waste management, transportation and traffic safety. During construction and operation of the facility, solid waste and wastewater production will be minimized and properly be disposed or recycled by PSE.

Air Quality

Both Garfield and Columbia Counties are classified as attainment areas for all criteria pollutants. This means that ambient air quality within these counties and the project area meets the National and Washington Ambient Air Quality Standards (NAAQS/WAAQS). The most prevalent sources of air pollution in both counties are mobile and non-point sources, including outdoor burning, agricultural tilling and harvesting, fugitive dust from paved and unpaved roads, and emissions from vehicles using paved and unpaved roads.

The primary type of air pollution generated during project construction will be emissions from vehicle and equipment exhaust, and fugitive dust particles from travel on paved and unpaved surfaces. During the peak construction period, an estimated 320 daily employee trips will occur, with 160 of these trips occurring during the evening peak hour. The fugitive dust particles occur when disturbed soils become airborne. Heavy trucks and construction equipment powered by gasoline and diesel engines will generate various carbon emissions, nitrogen oxides, and particulate matter in exhaust emissions. These emissions will be temporary and limited to the immediate area surrounding the construction site.

During project operations, travel on the new and upgraded private gravel access roads will generate limited amounts of fugitive dust and carbon dioxide, hydrocarbon, nitrogen oxides, and particulate matter emissions. This traffic is expected to consist of weekly or less frequent trips to turbines in service vehicles for maintenance and repair activities. The number of vehicle trips associated with workers commuting to and from the O&M facility on paved state and county roads will be approximately 40 trips during a 24-hour period. Therefore, it is unlikely that the resulting dust will generate a significant air quality impact in excess of the NAAQS/WAAQS.

Operation of the Wind Project itself will result in minimal emissions. Unlike more traditional energy sources such as gas or coal-fired turbines, the portion of the Wind Project that will generate electricity – the wind turbines – will not emit any air pollutants. Accordingly, Wind Project operation will not contribute to the accumulation of greenhouse gasses from traditional energy sources and other sources, which has been identified as a source of climate change and global warming.

Transportation

Most public roads in the project vicinity are paved county and private roads, with a few federal and state routes traversing the area (US Route 12 and State Routes 127 and 261). In addition, several unpaved and gravel county and private roads are present adjacent to agricultural fields within the project area. Traffic volume levels along local roads currently are low.

The existing road network will provide the primary routes for construction of the Wind Project, which is expected to be constructed in four or more phases starting in 2010. Multiple phases will extend the length of time of potential traffic-related impacts, but will reduce the severity of these impacts within each phase of development. The wind turbines, towers, transformers, and other large equipment will be transported to the site using a semi-truck and lowboy transporter designed for heavy loads (i.e., multiple axles). Short-term traffic delays on project area roads from slower-moving project construction vehicles may temporarily occur. In addition, some local roads will need to be improved to accommodate heavier construction equipment, which could result in traffic delays during road improvement periods. Construction employee trips also will generate traffic on project area roads during the construction period. As mentioned above, an estimated 320 daily employee trips will occur during the peak construction period, with 160 of these trips occurring during the evening traffic peak hour. Given the existing low volume of traffic on project area roads and the temporary nature of impacts, these effects from the Wind Project would be minor. In the long term, these road improvements result in a benefit to the local road system.

After the Wind Project construction is completed, vehicles associated with operation will generally be limited to the vehicles of the 12 to 14 full-time employees working at the Wind

Project, as well as occasional maintenance trucks and vehicles. It is estimated that the maximum number of worker vehicle trips will be 40 during a 24-hour period. Given their extremely low volume and occasional nature, transportation impacts from these additional trips will be negligible.

Cumulative Impacts

The BP EIS and RP EIS provide an analysis of potential cumulative impacts resulting from development of generation resources and transmission facilities in the region. Many other wind projects have been built or are reasonably certain to be built in the region. There are currently over 2,000 MW of wind energy connected to the transmission grid within BPA's Balancing Area, and several thousand more MW of wind power are expected to be developed and connected to the grid in the next few years.[4] For example, based on current proposals, BPA has projected that approximately 4,000 MW of new wind power generation will be developed in the region by about 2013. Results from the Business Plan and RP EISs, as well as other regional studies, are used in the following sections discussing cumulative impacts.

Land Use and Recreation

Overall, wind projects and associated facilities have relatively little direct impact on land use because the footprint of the facilities is small even if they occur across large areas. Additionally, wind projects tend to reinforce existing agricultural land uses that are the primary land uses in most areas proposed for wind energy. Wind projects are generally compatible with all types of agriculture and, once the wind projects are built, tend to inhibit conversion of these lands to other uses. Wind lease payments also provide a supplemental source of income for farmers, helping them weather the uncertainties of agricultural yields and prices so that they can better maintain agricultural practices on their lands.

State and local land use regulations in Oregon and Washington require, depending on the size of the project, either county land use approval or State approval, prior to construction of additional facilities. This permitting process is designed to prevent incompatible uses and the degradation of farmland. The potential for cumulative impacts to land use is substantially minimized by these regulations.

Due to their location and typical dispersed configurations, wind projects and associated facilities have little direct impact to recreation in agricultural areas. Dispersed hunting that may occur in the region normally could continue after construction and during turbine operation.

Geology and Soils

Cumulative wind project development has resulted in soil disturbance at wind project sites throughout the region. However, the amount of cumulative ground disturbance is very small due to the small actual footprint of wind project facilities. Ground disturbance from construction of energy projects close together could increase erosion potential in some areas as a result of the decrease in soil storage area. Additional wind projects and associated facilities needed in the

[4] BPA. Factsheet: *How BPA Supports Wind Power in the Pacific Northwest.* DOE/BP-4002. March 2009.

future could also increase the potential for erosion, but the relatively small footprint of wind projects, and standard control and containment measures would limit these impacts.

Vegetation

Native plant communities are being lost in the region because of past and current development and actions, and these trends will likely result in the further reduction of native plant communities. Additional projects in the area combined with the acreages already planned for development will increase the total acreage in the region used for wind development. The permanent footprint (during operations) of wind projects is small compared to the total acreage of the projects, and will remove small amounts of agricultural land and native habitats. The area taken up by each turbine and associated facilities, including roads and substations, will be changed and could no longer be habitat. The acreage not used for facilities will remain unchanged. No land use changes and subsequent potential habitat changes will occur. Some projects will set aside acreage to mitigate impacts to wildlife habitat.

Most vegetative communities in the analysis area have been previously disturbed by human activities. The actions associated with the proposed projects would contribute incrementally and in a relatively minor way to the continuing cumulative loss of native vegetation communities.

Water Resources and Wetlands

Water quality, water use, and wetland impacts related to new wind generation projects will be temporary and minor, and subject to further regulatory approvals. Most wind project infrastructure is located on ridgetops and upland areas away from wetlands and water resources. In areas where wetland and water resources are present, wind project facilities almost always can be located to avoid these resources. Cumulative impacts to wetlands and water resources from PSE's wind project and other wind projects in the region are expected to be negligible because wetlands and water resources are scarce in the area, and wind project infrastructure is primarily located in upland areas where these resources generally are not present.

Fish Species

Potential cumulative impacts to fish and other aquatic resources from past, present, and future development in the region include the loss of riparian habitat, increased sediment loading, increased stream temperatures, pollution from herbicide and insecticide use, changes in peak and low stream flows, fragmentation of fish habitat, decreases in streambank stability, and altered nutrient supply. Since the regional wind projects currently proposed are typically located in upland areas and generally well away from fish habitat, these proposed projects will not be expected to contribute to direct cumulative impacts to fish species.

However, the interconnection of existing and proposed wind-powered generation projects in the region to the BPA transmission system does pose the potential for cumulative impacts to listed Columbia River fish species through a somewhat complex relationship among the wind projects, Columbia River hydro operations, and operation of this hydrosystem to meet Clean Water Act (CWA) and ESA requirements for listed fish species.

Many of the region's wind generators are located within what is known as the BPA Balancing Area. In BPA's Balancing Area, like in all balancing areas, there must be a match between

generation and loads at all times. Within BPA's Balancing Area, most existing and proposed wind projects are concentrated in one geographic area, located to the east of the Columbia River Gorge. Because of this concentration, the amount of wind power on BPA's transmission system tends to vary with the sometimes widely fluctuating wind velocities (and hence wind project output) in this area. That is, when wind speeds are low in this area, there is very little wind power generated, and the amount of wind power on BPA's system is low. Conversely, when wind speeds are high, the wind projects are generating close to or at full capacity, and the amount of wind power on BPA's system is high.

The proportion of wind power on BPA's transmission system has grown quickly and dramatically in recent years, and even greater future growth is expected. As of May 2009, there were approximately 2,100 MW of total wind generation interconnected to the BPA system. In addition, BPA currently has contracts in place that will allow for the interconnection of an additional 2,100 MW of wind generation to the BPA system. These projects may be built and operational within the next few years.

The combination of an increasingly large proportional share of wind power on BPA's system and the natural fluctuation of this power results in large, unscheduled swings in wind generation of up to several hundred megawatts within a single hour. To address this situation, BPA currently reserves capability in the hydrosystem to provide balancing services for these swings when needed. At times, maintaining the reserve can cause additional water to spill over the dams.

The potential for impacts to Columbia River fish arises when the electrical output from wind generators in the region exceeds their hourly generation schedules. In such situations, BPA must immediately decrease generation in the BPA Balancing Area to maintain the constant balance of generation and load needed to keep the system stable. This can be accomplished in one of three ways. First, BPA could reduce overall Columbia River water flows and generation by releasing less water from Columbia River hydro projects and putting the water into storage. Second, BPA could decrease hydro project generation by spilling water over the dams rather than running it through the dam turbines. Third, BPA could reduce other sources of generation within the BPA Balancing Area.

During certain times and conditions, the first option of storing the water is not available because reservoir space is being maintained for required flood protection at the hydro projects. At these times, river flows are already high due to spring runoff or other required drafts to maintain flood control space. Because of these flood control requirements, here simply is no space at the reservoirs in which to store additional water to decrease generation during these periods.

Likewise, the second option – spilling water over the dams – is not available during certain times and conditions because this spilling results in elevated levels of total dissolved gases developing in the river. As the amount of water spilled increases, so does the level of total dissolved gases. The CWA standards for total dissolved gases, which were established to protect fish, limit the level of dissolved gas saturation permissible in the river when migrating salmon are present. Increased spilling during these times runs the risk that these CWA standards would be violated.

Increased spilling also increases the potential for ESA-listed fish species to be impacted. Gas supersaturation resulting from high levels of spill can lead to gas bubble trauma in fish or other aquatic organisms as a result of excessive uncompensated gas pressure which they cannot avoid. Species, life-stage, size and genetics are all important factors in determining the tolerance of fish

to supersaturated waters. Acute mortality will occur when gas bubbles are present in the heart in sufficient quantity to prevent the movement of blood. Various sublethal effects have also been reported to significantly impact mortality, most importantly blindness, decreased tolerance to stress, loss of lateral sense, and secondary infections. Acute affects may be reversed by exposure to equilibrated water or to increased hydrostatic pressure. However, permanent affects to individuals and large-scale mortality in populations may occur after only short-term exposure to high levels of gas, especially in environments where compensating pressures do not exist. In these settings, large-scale mortality can occur in a matter of hours.

In natural circumstances, the limit of safe gas supersaturation levels depends on the depth within the water column a specific fish species swims. The naturally occurring levels of gas in the Columbia and Snake rivers varies between 105 percent and 120 percent of equilibrium total gas saturation pressure (ambient atmospheric pressure). Within the Columbia and Snake rivers, the state standards for saturation are limited to 110 percent of saturation at any point of sample collection without a state waiver. The U.S. Army Corps of Engineers has obtained a state waiver from Oregon and Washington. Because of this waiver, the standard level of gas in the river is 120 percent. Running the river to this level, but no higher, has become a fundamental component of how spill and resultant fish passage has been managed at hydroelectric power generation facilities.

An example of the potential for cumulative impact of wind development occurred in spring 2008, when wind turbines in BPA's Balancing Area produced significantly more power than scheduled over several hours. During this time, wind generation peaked at over 400 MW above the prescheduled amount. BPA was forced to reduce hydrosystem generation to accommodate this unscheduled wind generation and provide necessary balancing services. Due to high water flows in the Columbia River at the time, water was already spilling over dams above that needed for fish protection. Decreasing hydro generation at that time meant increasing water spill, and nitrogen saturation in the water rose nearly to levels dangerous to fish species.

For these reasons, BPA currently is working with wind project developers and operators to move toward the third option of developing measures for temporarily reducing sources of wind generation within the BPA Balancing Area when necessary. These measures will ensure that wind power on BPA's transmission system does not cumulatively impact Columbia River hydro operations necessary for listed fish species. As part of a comprehensive review of wind project interconnections and their effects that was conducted in winter 2008, BPA has established transmission operation protocols under which BPA's dispatch system automatically instructs wind project operators to reduce their generation to specified levels if necessary for reliability and ESA or CWA compliance. BPA has issued Dispatcher Standing Order (DSO) 216 to document these protocols, and is continuing to refine and clarify this DSO as more is learned about wind project operations relative to BPA's transmission system (visit http://www.transmission.bpa.gov/wind/op_controls/default.cfm for more information).

Terrestrial Wildlife

The current and proposed wind projects in the analysis area will have low incremental impacts to non-avian terrestrial species because much of area is agricultural and disturbance to these species occurs regularly. Additional fragmentation and reduction will be offset by mitigation (habitat

restoration, or conservation easements). Likewise, operation of these facilities is not expected to adversely affect most terrestrial species.

Bird Species

Annual avian mortality estimates at six recently constructed wind farms in the Columbia Plateau Ecoregion ranged from 0.9 to 2.9 birds per MW, averaging 1.9 avian deaths per MW per year. Assuming that mortality rates are representative of the region, new wind power generation could cause between approximately 3,650 and 11,775 and on average 7,715 avian deaths per year in the region (based on 4060 MW of power generated).

Raptors

At modern wind power projects in the Columbia Plateau Ecoregion, raptor mortality has been low, ranging from 0 to 0.14 raptor fatalities per MW per year. An added 4,060 MW of wind capacity in the region could result in between 0 and 568 fatalities per year, on average about 280 raptor deaths per year. Red-tailed hawk, American kestrel, and northern harrier account for most of the summer raptor use at other projects where avian use was studied while rough-legged hawk and red-tailed hawk account for majority of the winter use. These 4 species are expected to be the raptor species with the highest collision risk across all the projects. The potential exists for other species to collide with turbines, including Swainson's hawk, ferruginous hawk, turkey vulture, golden eagle, Cooper's hawk, sharpshinned hawk, prairie falcon, and bald eagle; however, the mortality risk associated with these species is expected to be lower due to the lower use by these species in general.

Red-tailed hawk and American kestrel account for more than 69 percent of the raptor fatalities recorded at the regional wind projects studied. Assuming this trend holds true for all proposed wind projects in the Columbia Plateau, it is expected that, on average, 70 red-tailed hawks and 70 American kestrels will be killed each year. Approximately 18 red-tailed hawk and kestrel fatalities will occur during the breeding season. An estimate of the breeding population in the Columbia Plateau, based on the long-term average data is approximately 6,820 breeding red-tailed hawks and 6,288 breeding American kestrels. The impact to the breeding population will be approximately 0.26 percent and 0.28 percent of the population respectively, which is likely to be below background mortality for these species and is not considered to have an effect on the regional populations. The other species of raptors have been impacted far less and will represent a much smaller number of fatalities.

Passerines

Passerines have been the most abundant species among the avian fatalities at wind projects studied. For projects in the Columbia Plateau Ecoregion, on average approximately 69 percent of the avian fatalities have been passerine. Both migrant and resident passerine fatalities have been observed, with migrants generally making up 20 to 30 percent of the avian fatalities. Assuming that 69 percent of all bird mortality will be passerine fatalities, between approximately 2,518 and 8,125 (on average 5,323) passerine deaths per year in the region will occur. Some impacts are expected for nocturnal migrating passerine species, however, impacts are expected to be low for the Columbia Plateau Ecoregion. Estimates for nocturnal migrant mortality at the regional wind projects have ranged from 0.27 to 0.73 per MW per year or about 1,090 to 2,960 nocturnal migrant fatalities for the 4060 MW of wind power expected to be constructed.

Passerine species most common to the project sites, including horned lark and western meadowlark, will likely be most at risk. Horned larks represent approximately 35 percent of the avian fatalities in the Columbia Plateau Ecoregion at wind projects.

Local populations of horned larks are difficult to define because of the vast amount of suitable habitat for this species in the Columbia Plateau. However, based on data from the United States Geological Survey Breeding Bird Survey for routes in the Columbia Plateau, the breeding horned lark population in the Columbia Plateau is calculated to be approximately 127,500 horned larks. If it is further assumed that the 2,715 horned lark fatalities are spread equally over the year, then roughly one-quarter of these fatalities (approximately 680) will be during the breeding season.

This number represents approximately 0.5 percent of the breeding horned larks and is not considered high enough to affect population dynamics. It is likely that other background mortality of breeding horned larks is greater than this estimate. Similar calculations for other passerine species indicate that impacts to these species will be minor and unlikely to have any population effects.

In general for wind projects in the Columbia Plateau, approximately 25 percent of the fatalities have been to migrants spread over many species. The most common migrant fatality (9 percent) was golden-crowned kinglet. Golden-crowned kinglets are typically associated with tree or wooded habitats during the breeding season, so it is assumed that many of the impacted individuals were from surrounding more mountainous ecoregions or populations further north (e.g., Canada). As with horned lark, estimating the potential population size from which these birds came requires a number of assumptions. However, while it is unknown, it is possible that the individual fatalities came from multiple populations in surrounding or more northern ecoregions, thus diluting the impacts on any one population. Other potential migrant species were found in lower numbers. Cumulatively the impacts to migrants will be spread over a much larger population base and are not considered to have population effects.

Upland Gamebirds

For projects in the Columbia Plateau Ecoregion, upland gamebirds have composed a higher percentage of avian fatalities than in other regions of the United States, approximately 18 percent of all avian fatalities. Estimates for upland game bird mortality in the Columbia Plateau Ecoregion have varied from 0.27 to 0.47 per MW per year, or between 1,090 and 1,910 upland gamebird fatalities per year. The upland game bird species most commonly impacted (ring-necked pheasant, gray partridge, and chukar) are introduced species common in mixed agricultural native grass/steppe habitats. There is generally low concern over impacts to introduced species of upland gamebirds. These species are regulated by state agencies as game species. Impacts from wind farms to these species are not expected to have population level effects given the vast amounts of suitable habitat and other sources of impacts to these species (e.g., hunting).

Bat Species

Results of fatality monitoring for the Columbia Plateau Ecoregion wind projects indicate mortality ranges of approximately 0.63 to 2.46 bats per MW per year. Based on these results, and considering the similarities in the characteristics of the project areas and other regional

projects, a conservative estimate of total bat mortality will be between 2,550 and 9,990 bats per year, assuming 4,060 MW of wind power is constructed.

Fatalities to only four species (silver-haired bat, hoary bat, little-brown bat, and big-brown bat) have been documented for six wind projects monitored in the Columbia Plateau Ecoregion. The annual period when most bat fatalities occur is in August and September. Studies indicate that most bat fatalities occur during migration, with low mortality associated with resident bat species. The species at highest risk appear to be foliage-dwelling (trees) fall migratory species.

Unlike with birds, there is little information available about populations of bat species. Bat mortality in the Columbia Plateau Ecoregion will involve primarily silver-haired and hoary bats, and no impacts to threatened or endangered bat species are anticipated. Hoary and silver-haired bats are wide spread across North America and breed into the boreal forests regions of Canada and migrate south to winter in the southern United States, Mexico, and potentially further south in Central America. In general, mortality levels on the order of 1 to 2 bats per turbine are not significant to populations, however, cumulative effects may have greater consequences for long-lived low-fecundity species such as bats. Unlike many avian species that may have multiple clutches of multiple young per year, hoary bats and silver-haired bats likely only raise one or two young per year and only breed once per year. Bats tend to live longer than birds, however, and may have a longer breeding lifespan. The impact of the loss of breeding individuals to populations such as these is generally unknown but may have greater consequences.

Historic and Cultural Resources

Cumulative effects on cultural resources are associated with construction activities and permanent land use change through development of new wind generation projects. Because the developments are likely to be dispersed, impacts are unlikely to be concentrated, so loss of cultural artifacts from an entire cultural source is unlikely. Most wind facilities conduct cultural resource surveys prior to final siting to avoid impacting cultural resources. Wind projects can be located to avoid these resources if any are found.

Visual Resources

Additional turbine installation will increase the number of locations from which turbines would be visible. Because future wind energy development will likely occur in rural areas, most visual impacts would be experienced by the relatively few residents of the rural areas. Turbines will also be visible to other residents and people traveling through on public roads near the wind project areas. The significance of the visual changes will vary according to the location of the wind project and the perceptions of the viewers. Some viewers find that wind energy projects add a positive element to the visual environment, while others disagree. Over time, the cumulative effect of the addition of multiple wind farms throughout the region will change the visual landscape from primarily agricultural to more industrialized, although the basic visual elements that currently exist will be retained.

Noise

Wind generation projects create noise during the construction period of the project. If multiple wind projects were constructed in the same area at the same time, a minor increase in

construction noise would occur. No operational noise impacts are anticipated other than the sound of the blades when the turbines are operating and intermittent noise associated with substation operations. Noise easements, moving or eliminating turbines, or other measures are typically required during the permitting processes if noise increases are above state standards.

Public Health and Safety

Any potential risks to the health and safety of workers or the general public associated with the construction of the wind projects will be incidental and comparable to other construction projects. The long-term risk to the health and safety of residents and passersby from operation and maintenance of wind turbines and associated infrastructure is low, due to the small number of people living and working in the predominantly rural areas, and the large area over which the various wind farms will be scattered.

Socioeconomics and Public Services

Wind lease payments to farmers will provide a supplementary source of income that could help farmers retain their farms when farm prices or weather reduce other sources of farm income. Additional development will provide tax revenue to local governments. New wind generation projects will create temporary effects on housing. Because these effects will be temporary and may occur during separate time periods, accumulation of impacts related to project construction will be minor.

Cumulative impacts on public services and utilities will be largely dependent on facility siting. Emergency services could have a higher demand if there are additional facilities to cover in the same service area. However, this additional demand could be offset by additional tax revenue. Impacts to utilities from additional wind energy integration are addressed during system planning studies, and minimized or eliminated with appropriate equipment within the system.

Air Quality

Air quality issues associated with wind energy are limited to construction emissions, which can be minimized by the use of reasonable controls on all projects. These impacts are temporary and generally not significant. In the long term, cumulative development of wind projects may help to reduce the production of air pollutants by replacing a small percentage of energy that otherwise will have to be generated, presumably, by more traditional energy sources such as gas- or coal-fired turbines. This cumulative wind development also could serve to reduce greenhouse gasses in the atmosphere because of this displacement.

Transportation

If two or more wind projects are built at the same time in an area where the construction traffic uses the same road network, the construction-related traffic will have a cumulative effect. These effects will be temporary. To minimize these effects during construction, the projects involved could investigate coordinating delivery schedules and routes, using shared resources to minimize trips, and coordinating construction schedules to address any temporary constraints on traffic flow that develop. The Public Works Departments in each county could work with project developers to ensure shared responsibility for any road improvements or repair.

MITIGATION

Specific resource mitigation conditions to avoid or minimize environmental harm from the Wind Project were identified through the SEPA EIS and Garfield County CUP processes and are incorporated here by reference.

PUBLIC AVAILABILITY

This Record of Decision (ROD) will be available to all interested parties and affected persons and agencies. It is being sent to all stakeholders who requested a copy. Copies of the BP EIS, BP ROD, BP Supplemental Analysis, and additional copies of this Lower Snake River Wind Energy Project ROD are available from BPA's Public Information Center, P.O. Box 3621, Portland, Oregon, 97208-3621. Copies of these documents may also be obtained by using BPA's nationwide toll-free document request line: 1-800-622-4520, or by accessing BPA's Web site: www.efw.bpa.gov.

CONCLUSION

BPA has decided to offer contract terms through a LGIA for interconnection of up to 1,250 MW of power from the Lower Snake River Wind Energy Project into the FCRTS at a new Central Ferry Substation in Garfield County, Washington. The LGIA provides for interconnection of 1,250 MW from the Wind Project with the FCRTS, the operation of this amount of power from the Wind Project in the BPA Balancing Area (including control area services such as generation imbalance service), and the maintenance of reliability of the FCRTS and interconnected systems. As described above, BPA has considered both the environmental and economic consequences of taking action to integrate power from the Wind Project into the FCRTS. This decision is:

- within the scope of environmental consequences examined in the BP EIS;
- in accordance with BPA's Open Access Transmission Tariff and associated LGIP; and
- in accordance with BPA's statutory authority to make available to all utilities any capacity in this system determined in excess to that required by the United States (16 U.S.C. 838d).

BPA will take measures to ensure the continuing safe, reliable operation of the FCRTS. This ROD identifies all practicable means to avoid or minimize environmental harm that might be caused by the integration of the Project into the FCRTS.

BPA contracts providing for integration of power from the Project into the FCRTS at the new Central Ferry Substation will include terms requiring that all pending permits be approved before

the contract is implemented. BPA contracts will also include appropriate provisions for remediation of oil or other hazardous substances associated with construction and operation of related electrical facilities in a manner consistent with applicable federal, state, and local laws.

Issued in Portland, Oregon.

/s/ Stephen J. Wright — *January 28, 2010*
Stephen J. Wright — Date
Administrator and
Chief Executive Officer