Chapter 28 Consistency with State Substantive Standards

Words in **bold** and acronyms are defined in Chapter 32, Glossary and Acronyms.

BPA is a federal agency subject to state regulation only if there has been a waiver of federal sovereign immunity through federal law, consistent with the supremacy clause of the U.S. Constitution. Certain federal laws, such as the Clean Water Act (CWA) and Clean Air Act (CAA), have provided this waiver of federal sovereign immunity, and BPA's activities thus can be regulated by state entities under these laws. The Federal Land Policy Management Act (FLPMA), 43 USC §1701 et seq., provides a limited waiver of federal sovereign immunity, such that federal agencies including BPA are required to comply with specific substantive provisions for environmental protection that may be identified by states for portions of the federal agency's activities that would be located on federal lands.

Notwithstanding these aspects of federal supremacy, BPA is committed to planning its transmission line projects to be consistent or compatible, to the extent practicable, with state plans and programs, as well as any substantive standards that these plans and programs may contain, even when not required by federal law. To work towards this goal, BPA typically provides project information relevant to state permitting processes to state entities with a potential interest in the project. In designing and carrying out its proposed projects, BPA also strives to meet or exceed the substantive standards and policies of state regulations.

To further memorialize this approach, BPA entered into a series of Memoranda of Understanding (MOUs) and Memoranda of Agreement (MOAs) in the 1980s with individual Pacific Northwest states concerning BPA's activities in each state, including Washington and Oregon (State of Washington and BPA 1983a, 1983b; State of Oregon and BPA 1981). Each MOU called for general cooperation between BPA and each state regarding BPA's activities in that state, and each MOA called for cooperation specifically on the siting of proposed federal transmission facility projects to be located in that state. Each MOA also called for the development of project-specific work plan agreements between BPA and the state for individual BPA transmission line projects to be located in that state.

In the MOU and MOA with the states of Washington and Oregon, the agencies that are designated with the responsibility for entering into and carrying out work plan agreements for each individual BPA transmission line project are Washington EFSEC and the Oregon DOE. Because the project would be located in both Washington and Oregon, BPA has entered into work plan agreements with EFSEC and ODOE for this project. Under these agreements, the state agencies have provided BPA with potentially applicable state substantive standards that they believe should be addressed in this EIS to aid state agency review of the project. It is the objective of BPA, EFSEC, and ODOE that by identifying and considering these standards as early as possible, the project can be designed to be consistent or compatible with these standards to the maximum extent practicable.

The remainder of this chapter identifies those state substantive standards that are potentially applicable to the project, and evaluates the extent to which the project would be consistent with these standards. This discussion is organized by the state agency that has established each standard, with the standards of each agency further organized by resource topic where appropriate. In most cases, BPA believes that implementation of its own design, construction,

and operation standards would serve to meet or exceed the state substantive standards that have been identified. However, in some cases, additional measures may be required to be consistent with a particular state standard. For any state standards where it is likely that consistency cannot be achieved, an explanation is provided.

28.1 Washington EFSEC Standards

Washington EFSEC is the state agency responsible for siting new energy facilities in the state of Washington, including certain thermal power plants, alternative energy facilities, natural gas pipelines, and electrical transmission lines. EFSEC's authority in this area is provided by RCW Chapter 80.50, and is implemented through WAC Title 463.

BPA's transmission lines are not subject to EFSEC's siting jurisdiction except for portions proposed to be located on federal lands administered by the BLM or are part of the National Forest System administered by the U.S. Forest Service. The proposed project would not be located on any such federal land. Nonetheless, BPA will seek to be consistent with EFSEC's substantive standards to the extent practicable.

The following EFSEC substantive standards from WAC Title 463 (WAC 463-26, 463-60, 463-72, and 463-74) are potentially applicable to the project:

28.1.1 Natural Environment—Energy and Natural Resources

- The application shall describe the rate of use and efficiency of consumption of energy and natural resources during both construction and operation of the proposed facility.
- The application shall describe the sources of supply, locations of use, types, amounts, and availability of energy or resources to be used or consumed during construction and operation of the facility.
- The application shall describe all nonrenewable resources that will be used, made inaccessible or unusable by construction and operation of the facility.
- The application shall describe conservation measures and/or renewable resources that will or could be used during construction and operation of the facility.

Consistency: General information on likely use and consumption of energy and natural resources is provided throughout the EIS. However, detailed information regarding the source, locations of use, and rate of use and efficiency of consumption of energy and other resources is beyond the scope of this EIS. Impacts on natural resources are addressed by resource in Chapters 5 through 22. Irreversible or irretrievable commitments of resources (both renewable and nonrenewable resources) are discussed in Chapter 25, Irreversible or Irretrievable Commitment of Resources.

- The application shall describe any scenic resources which may be affected by the facility or discharges from the facility.

Consistency: Chapters 5, 6, and 7 (Land, Recreation, and Visual Resources) describe the project's impact on visual resources including impacts on recreational areas. There would be no discharges from the transmission line but there would be stormwater discharge from the

substations. Through its compliance with the CWA, BPA seeks appropriate certifications and authorizations from state water quality regulatory agencies for its proposed projects. BPA would meet all applicable standards identified through this process to protect water quality. Substation designs would include stormwater detention ponds to control outflow (not required at Sundial Substation). Information concerning the project's potential impacts on water quality is provided in Chapter 15, Water. BPA's CWA compliance activities are described in Chapter 27, Consultation, Permits, and Review Requirements.

28.1.2 Transportation

- **Transportation systems**. The application shall identify all permanent transportation facilities impacted by the construction and operation of the energy facilities, the nature of the impacts, and the methods to mitigate impacts. Such impact identification, description, and mitigation shall, at least, take into account
    - Expected traffic volumes during construction, based on where the work force is expected to reside
    - Access routes for moving heavy loads, construction materials, or equipment
    - Expected traffic volumes during normal operation of the facility
    - For transmission facilities, anticipated maintenance access
    - Consistency with local comprehensive transportation plans
- **Vehicular traffic**. The application shall describe existing roads, estimate volume, types, and routes of vehicular traffic which will arise from construction and operation of the facility. The applicant shall indicate the applicable standards to be utilized in improving existing roads and in constructing new permanent or temporary roads or access, and shall indicate the final disposition of new roads or access and identify who will maintain them.
- **Waterborne, rail, and air traffic**. The application shall describe existing railroads and other transportation facilities and indicate what additional access, if any, will be needed during planned construction and operation. The applicant shall indicate the applicable standards to be utilized in improving existing transportation facilities and in constructing new permanent or temporary access facilities, and shall indicate the final disposition of new access facilities and identify who will maintain them.
- **Parking**. The application shall identify existing and any additional parking areas or facilities which will be needed during construction and operation of the energy facility, and plans for maintenance and runoff control from the parking areas or facilities.
- **Movement/circulation of people and goods**. The application shall describe any change to the current movement or circulation of people or goods caused by construction or operation of the facility. The application shall indicate consideration of multipurpose utilization of rights of way and describe the measures to be employed to utilize, restore, or rehabilitate disturbed areas. The application shall describe the means proposed to ensure safe utilization of those areas under applicant's control where public access will be granted during project construction, operation, abandonment, termination, or when operations cease.
- **Traffic hazards**. The application shall identify all hazards to traffic caused by construction or operation of the facility. Except where security restrictions are imposed by the federal government the applicant shall indicate the manner in which fuels and

waste products are to be transported to and from the facility, including a designation of the specific routes to be utilized.

Consistency: Construction and improvement of the access road system for the project is discussed in Chapter 3, Project Components. Chapter 12, Transportation describes the project's general impacts on transportation resources. The movement or circulation of people or goods in certain areas may be temporarily affected during construction of the project. Potential impacts on water, rail, and air traffic are also addressed in Chapter 12. Road use during construction and operation and maintenance of the line would comply with regional transportation plans. Access roads constructed as part of the project would also be used during maintenance of the transmission line. Fuel would be transported to work sites using the same access roads discussed in Chapters 3 and 12. Staging areas that would be used to store construction materials and vehicles are discussed in Chapter 3.

28.1.3 Socioeconomic

- The application shall include a detailed socioeconomic impact analysis which identifies primary, secondary, and positive as well as negative impacts on the socioeconomic environment in the area potentially affected by the project, with particular attention to the impact of the proposed facility on population, work force, property values, housing, health facilities and services, education facilities, governmental services, and local economy. The study area shall include the area that may be affected by employment within a 1-hour commute distance of the project site. The analysis shall use the most recent data as published by the U.S. Census or state of Washington sources.
- The analysis shall include the following:
    - Population and growth rate data for the most current 10-year period for the county or counties and incorporated cities in the study area
    - Published forecast population figures for the study area for both the construction and operations periods
    - Numbers and percentages describing the race/ethnic composition of the cities and counties in the study area
    - A description of whether or not any minority or low-income populations would be displaced by this project or disproportionately impacted
    - The average annual work force size, total number of employed workers, and the number and percentage of unemployed workers including the year that data are most recently available. Employment numbers and percentage of the total work force should be provided for the primary employment sectors
    - An estimate by month of the average size of the project construction, operational work force by trade, and work force peak periods
    - An analysis of whether or not the locally available work force would be sufficient to meet the anticipated demand for direct workers and an estimate of the number of construction and operation workers that would be hired from outside of the study area if the locally available work force would not meet the demand
    - A list of the required trades for the proposed project construction
    - An estimate of how many direct or indirect operation and maintenance workers (including family members and/or dependents) would temporarily relocate
    - An estimate of how many workers would potentially commute on a daily basis and where they would originate

- The application shall describe the potential impact on housing needs, costs, or availability due to the influx of workers for construction and operation of the facility and include the following:
    - Housing data from the most recent 10-year period that data are available, including the total number of housing units in the study area, number of units occupied, number and percentage of vacant units, median home value, and median gross rent. A description of the available hotels, motels, bed and breakfasts, campgrounds, or other recreational facilities
    - How and where the direct construction and indirect work force would likely be housed. A description of the potential impacts on area hotels, motels, bed and breakfasts, campgrounds, and recreational facilities
    - Whether or not meeting the direct construction and indirect work force's housing needs might constrain the housing market for existing residents and whether or not increased demand could lead to increased median housing values or median gross rents and/or new housing construction. Describe mitigation plans, if needed, to meet shortfalls in housing needs for these direct and indirect work forces
- The application shall have an analysis of the economic factors including the following:
    - The approximate average hourly wage that would likely be paid to construction and operational workers, how these wage levels vary from existing wage levels in the study area, and estimate the expendable income that direct workers would likely spend within the study area
    - How much, and what types, of direct and indirect taxes would be paid during construction and operation of the project, and which jurisdictions would receive those tax revenues
    - The other overall economic benefits (including mitigation measures) and costs of the project on the economies of the county, the study area, and the state, as appropriate, during both the construction and operational periods
- The application shall describe the impacts, relationships, and plans for utilizing or mitigating impacts caused by construction or operation of the facility to the following public facilities and services:
    - Fire
    - Police
    - Schools
    - Parks or other recreational facilities
    - Utilities
    - Maintenance
    - Communications
    - Water/storm water
    - Sewer/solid waste
    - Other governmental services
- The application shall compare local government revenues generated by the project (e.g., property tax, sales tax, business and occupation tax, payroll taxes) with their additional service expenditures resulting from the project; and identify any potential gaps in expenditures and revenues during both construction and operation of the project. This discussion should also address potential temporal gaps in revenues and expenditures.

- To the degree that a project will have a primary or secondary negative impact on any element of the socioeconomic environment, the applicant is encouraged to work with local governments to avoid, minimize, or compensate for the negative impact. The term "local government" is defined to include cities, counties, school districts, fire districts, sewer districts, water districts, irrigation districts, or other special purpose districts.

Consistency: Chapter 11, Socioeconomics provides a detailed discussion of the socioeconomic impacts from the project including impacts on population, work force, property values, housing, health facilities and services, education facilities, governmental services, and the local economy in Cowlitz, Clark, and Multnomah counties.

28.1.4 Land Use and Zoning

- The council shall make a determination as to whether the proposed site is consistent and in compliance with land use plans and zoning ordinances pursuant to RCW 80.50.090 (2).

Consistency: Area-wide and local plan and program consistency is addressed in Chapter 27, Consultation, Permits, and Review Requirements. Potential impacts on land use are addressed in Chapter 5, Land.

28.1.5 Site Restoration and Preservation

- When a site is subject to preservation or restoration pursuant to a plan as defined in WAC 463-72-040 through 463-72-060, the certificate holder shall conduct operations within terms of the plan; shall advise the council of unforeseen problems and other emergent circumstances at the site; and shall provide site monitoring pursuant to an authorized schedule. After approval of an initial site restoration plan pursuant to WAC 463-72-040, a certificate holder shall review its site restoration plan in light of relevant new conditions, technologies, and knowledge, and report to the council the results of its review, at least every 5 years or upon any change in project status. The council may direct the submission of a site preservation or restoration plan at any time during the development, construction, or operating life of a project based upon council's review of the project's status. The council may require such information and take or require such action as is appropriate to protect the environment and all segments of the public against risks or dangers resulting from conditions or activities at the site.

Consistency: Implementation of mitigation measures described in Chapter 3, Project Components, and those suggested at the end of some of the resource chapters, would reduce possible impacts during construction and maintenance and provide site restoration following construction.

28.1.6 Geology and Soils

- The seismicity standard for construction of energy facilities shall be the standards contained in the state building code.

Consistency: BPA would apply seismic standards applicable to transmission line and substation construction in its design specifications for the proposed transmission line and substations (see Chapter 14, Geology and Soils).

28.1.7 Water Quality

- Waste water discharges from projects under [EFSEC's] jurisdiction shall meet the requirements of applicable state water quality standards, Chapter 173-201A WAC, state groundwater quality standards, Chapter 173-200 WAC, state sediment management standards, Chapter 173-204A WAC, requirements of the Federal Water Pollution Control Act as amended (86 Stat 816,33 USC 1251, et seq.) and regulations promulgated thereunder.

Consistency: Through its compliance with the CWA, BPA seeks appropriate certifications and authorizations from state water quality regulatory agencies for its proposed projects. The project's consistency with state water quality standards is confirmed in part through a review of any wetlands fill permit proposed by the Corps. Section 401 of the CWA authorizes Ecology to review and certify proposed dredge and fill permits or other pollutant discharges to waters of the United States on non-federal lands or on federal land, if there has been a waiver of sovereign immunity. Ecology and the ODEQ are authorized to issue a Water Quality Certification under Section 401. BPA would meet all applicable standards identified through this process to protect water quality. Chapter 15, Water provides information on the project's potential effects on water quality, and Chapter 27, Consultation, Review, and Permit Requirements provides more information concerning BPA's CWA compliance activities.

28.1.8 Wetlands

- Wetland impacts shall be avoided wherever possible.
- Where impacts cannot be avoided, the applicant shall be required to take one or more of the following actions (in the following order of preference): Restore wetlands on upland sites that were formerly wetlands; create wetlands on disturbed upland sites; enhance significantly degraded wetlands; and preserve high-quality wetlands that are under imminent threat. Wetland mitigation actions proposed to compensate for project impacts shall not result in a net loss of wetland area except when the lost wetland area provides minimal functions and the mitigation action(s) will clearly result in a significant net gain in wetland functions as determined by a site-specific function assessment.

Consistency: In designing its projects, BPA attempts to avoid identified wetland areas where feasible. If wetlands cannot be avoided, BPA works to minimize potential impacts and compensate appropriately for unavoidable impacts. BPA would act consistently with EFSEC's standards related to wetlands during construction and maintenance of the proposed transmission line. Chapter 16, Wetlands provides information concerning the project's potential impacts on wetlands, and Chapter 27, Consultation, Review, and Permit Requirements provides more information concerning BPA's activities to comply with wetland regulations such as Sections 401 and 404 of the CWA.

28.1.9 Fish and Wildlife

- EFSEC encourages applicants to select sites that avoid impacts to any species on federal or state lists of endangered or threatened species or to priority species and habitats.
- An applicant must demonstrate no net loss of fish and wildlife habitat function and value.

- Restoration and enhancement are preferred over creation of habitats due to the difficulty in successfully creating habitat.
- Mitigation credits and debits shall be based on a scientifically valid measure of habitat function, value, and area.
- The ratios of replacement habitat to impacted habitat shall be greater than 1:1 to compensate for temporal losses, uncertainty of performance, and differences in functions and values.
- Fish and wildlife surveys shall be conducted during all seasons of the year to determine breeding, summer, winter, migratory usage, and habitat condition of the site.

Consistency: In designing its projects, BPA attempts to avoid impacts on fish and wildlife species where possible. Field surveys were conducted as needed in 2014, 2015, and will continue in 2016 to confirm the presence and/or absence of listed species in the project area. Potential impacts on ESA-listed species are discussed in Chapters 18, Wildlife and 19, Fish. These chapters also discuss potential effects to state-listed species and priority habitat and species, and recommend measures to mitigate impacts to species and habitat.

28.1.10 Air Quality

- Air emissions from energy facilities shall meet the requirements of applicable state air quality laws and regulations promulgated pursuant to the CAA, Chapter 70.94 RCW, and the Federal Clean Air Act (42 USC 7401 et seq.), and Chapter 463-78 WAC.

Consistency: To the extent that air emissions resulting from construction and maintenance of the transmission line and substation are regulated under state law, the project would comply with these regulations. Because operation of the proposed line would not result in any air emissions, other than maintenance and inspection vehicles and helicopters, there are no applicable standards for project operation (see Chapter 21, Air Quality).

28.1.11 Public Health and Safety

- The provisions of Chapter 173-303 WAC shall apply to the on-site activities, at energy facilities subject to this chapter, which involve the generation, storage, transportation, treatment or disposal of dangerous wastes.
- No person shall cause or permit noise to intrude into the property of another person which noise exceeds the maximum permissible noise levels set forth below in this section.
- The noise limitations established are as set forth in Table 28-1 after any applicable adjustments provided for herein are applied.
- Between the hours of 10 p.m. and 7 a.m. the applicable noise limitations shall be reduced by 10 dBA for receiving property within Class A environmental designations for noise abatement (EDNAs).
- At any hour of the day or night the applicable noise limitations may be exceeded for any receiving property by no more than: (i) 5 dBA for a total of 15 minutes in any 1-hour period; or (ii) 10 dBA for a total of 5 minutes in any 1-hour period; or (iii) 15 dBA for a total of 1.5 minutes in any 1-hour period.

- Sounds originating from temporary construction sites as a result of construction activity are exempt from these standards, except where such provisions relate to the reception of noise within Class A EDNAs between the hours of 10 p.m. and 7 a.m.

Table 28-1 Noise Limitations

EDNA[1] of Noise Source	EDNA of Receiving Property (dBA)		
	Class A	Class B	Class C
Class A	55	57	60
Class B	57	60	65
Class C	60	65	70

Notes:
1. EDNA: environmental designations for noise abatement.

Consistency: BPA would comply with all applicable state regulations concerning the generation, storage, transportation, treatment, or disposal of dangerous wastes during construction and maintenance of the transmission line. BPA also would conduct its construction and maintenance activities for the project in conformance with EFSEC's standards concerning maximum permissible noise levels through using appropriate muffling devices on construction and maintenance equipment and limiting construction and maintenance to daytime and evening hours (see Chapter 9, Noise). Noise impacts during operation of the transmission line and substations would meet federal and state noise guidelines and standards.

28.2 Washington State Department of Natural Resources Standards

The project area includes state lands managed by WDNR and state and private lands regulated by WDNR. This agency manages uplands for many purposes, including protection of state and federal threatened and endangered species, revenue for school construction, and environmental protection. Lands held in trust to support public beneficiaries generate earnings that help build or remodel public schools and universities. These revenues come from timber harvest on state trust lands, as well as from leases to farmers and ranchers and leases for mineral exploration and wind power generation (WDNR 2009b). WDNR holds a forest riparian easement, and owns lands set aside for genetic reserves, a Natural Resource Conservation Area, and a Natural Preserves Area. BPA would obtain easements and permits as appropriate for any WDNR lands crossed by the project.

The project area includes state trust lands, State-Owned Aquatic Lands managed by WDNR, and private lands regulated by WDNR. Within its scope, the department has multiple responsibilities ranging from the management, disposition and acquisition of certain public trust lands including aquatic lands and natural areas, to regulation of timber harvest activities and fire protection on non-federal lands. The department collects, analyzes, and distributes scientific data about state plants. The Washington State Geologist is also part of the WDNR and maintains and provides information on geologic hazards throughout the state.

The following WDNR policies are potentially applicable to the project.

28.2.1 Compliance and Cooperation with other State and Federal Laws

- Policy 08-028: The department will comply with SEPA by managing activities on trust agricultural and grazing lands through a phased review process.
- Policy 08-035: The department will actively promote and maintain long-term relationships with public and private organizations that affect the agricultural and grazing program.
- Policy 14-018: The department will utilize the requirements of SEPA to communicate department objectives and outcomes; to consider local, regional and statewide interests and concerns; and to develop and analyze forest management strategies.
- Policy 14-022: In carrying out its management activities, the department will actively communicate and promote collaboration with trust beneficiaries; Tribes; local, state, and federal governments; stakeholders; and the public.
- The department will comply with Chapter 43.21C RCW SEPA and Chapter 197-11 WAC SEPA Rules for all non-exempt proposed actions as defined by the SEPA laws including Chapter 332-41 WAC WDNR SEPA Procedures.

Consistency: BPA is committed to planning its transmission line projects to be consistent or compatible with existing land uses to the extent practicable. Information concerning the project's potential impacts on agriculture and forested lands, and mitigation measures identified to reduce or eliminate impacts on those resources are provided in Chapters 5, Land; 6, Recreation; 11, Socioeconomics; and 17, Vegetation. Information regarding the Farmland Protection Policy Act, which directs federal agencies to identify and quantify adverse impacts on farmlands, can be found in Chapter 27, Consultation, Review, and Permit Requirements.

As described in the introduction to this chapter, BPA is working with Washington EFSEC to help ensure that this EIS is adoptable under SEPA for all state and local agencies. BPA also is working with WDNR directly to ensure WDNR has the information it needs for any required SEPA compliance. This EIS will help with this compliance through its analysis of the impacts of the project to the natural and built environments in Chapters 5 through 22, and the information provided in Appendix A, WDNR Lands Analysis.

28.2.2 Geology and Soils

- Policy 08-029: The department will actively maintain or enhance soil productivity and quality on agricultural and grazing lands.
- The provisions in Chapter 43.92 RCW shall apply to geologic hazards, which include assessment and mapping of seismic, landslide, and tsunami hazards, estimation of potential consequences, and likelihood of occurrence.

Consistency: In designing its projects, BPA attempts to reduce impacts on soil productivity by implementing mitigation measures as listed in Chapter 14, Geology and Soils. Geologic hazards are also taken into account during line and substation design; landslide-susceptible areas are avoided if possible, and towers and substations are designed to withstand seismic hazards. Where landslide-susceptible areas are unavoidable, BPA is conducting additional geotechnical

analyses to inform the location and design of access roads and towers. Chapter 14 and Appendix J discuss areas along the routes with landslide or seismic hazards.

28.2.3 Water Quality

- Policy 14-010: The department will assess the potential for significant cumulative impacts of department activities on watershed systems, and develop mitigation strategies as needed.
- Policy 14-011: Statewide, the department will allow for no net loss of acreage and function of wetlands, as defined by state forest practices rules.
- Policy 08-031: The department will maintain or enhance the quality and longevity of water resources originating from, flowing through, or applied on department-managed lands.

Consistency: BPA seeks appropriate certifications and authorizations from state water quality regulatory agencies and will meet all applicable standards identified through this process to protect water quality. Chapter 15, Water and Chapter 16, Wetlands, includes information concerning the project's potential impacts on water quality and wetlands and mitigation measures that would reduce those impacts.

28.2.4 Biological Resources

- Policy -008: The department will actively participate with public and private sectors in developing and implementing pest and weed management programs.
- Policy 08-030: The department will maintain and enhance desirable vegetative communities on trust lands used for crop production, grazing, and wildlife habitat when compatible with agricultural and grazing program goals.
- Policy 14-008: The department will defer from harvest old-growth stands (stands 5 acres and larger that originated naturally, before 1850), in order to help meet WDNR's Habitat Conservation Plan (HCP) and regulatory requirements, over forest targets, and social/cultural values.
- When in the best interest of the trust(s), the department will actively seek to transfer old-growth stands and areas containing very large diameter trees of high social or cultural significance out of the trust status, when full market value compensation to the trust(s) is secured. In seeking to transfer such stands out of trust status, the department will immediately prioritize old-growth stands that are not subject to protection under WDNR's HCP or other applicable regulations.
- The department will comply with Title 17 RCW Weeds, Rodents, and Pests.
- The department will comply with Chapter 15.58 RCW Washington Pesticide Control Act.

Consistency: BPA's vegetation management would be guided by its Transmission System Vegetation Management Program EIS (see Chapter 3, Project Components; BPA and USDOE 2002). BPA is working with WDFW and underlying landowners on appropriate seed mixes that could encourage wildlife foraging habitat. Additionally, BPA works with the county weed boards and landowners on area-wide or site-specific plans for noxious weed control as budgets permit Resource compensation, right-of-way easements, and land purchased in fee would be negotiated with WDNR

28.2.5 Cultural Resources

- Policy 14-016: The department will identify and protect significant historic and archaeological sites, consistent with state and federal law.
- Policy 08-034: The department will, within trust management obligations, protect significant archaeological and cultural resources on agricultural and grazing lands.
- The department will comply with PO06-001 Historical, Cultural, and Archeological sites.

Consistency: As discussed in Chapter 27, Consultation, Review, and Permit Requirements, BPA seeks to comply with all applicable laws and other directives for the management of cultural resources. Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to take into account the effects of their undertakings on historic properties on all lands affected by proposed projects. Through the evaluation of this project in this EIS (see Chapter 13, Cultural Resources) and compliance with the Section 106 process and other review requirements, BPA will act consistently with WDNR's potentially applicable cultural resource policies.

28.2.6 Land Use and Socioeconomics

- Policy 08-012: The department will sell valuable materials from and lease, permit or contract agricultural and grazing lands for other surface and subsurface uses when in the best interest of the trust beneficiaries. In such cases: Existing agricultural lessees will be compensated by subsequent users for loss when crops or authorized improvements are damaged, when the lease is terminated, or lease renewal negotiation is denied.
- Existing grazing lessees will be compensated by subsequent users for loss when crops or authorized improvements are damaged, when the lease is terminated, or lease renewal negotiation is denied.
- Policy 14-014: When managing public access and recreation use on forested state trust lands, the department will protect trust interests and seek to balance economic, ecological and social concerns. The department will work to control negative effects of designated or dispersed public access and use on forested state trust lands through collaboration with the public, user groups, other landowners, and other agencies and organizations.
- Chapter 332-52 WAC public access and recreation.
- RCW 79.10.120 Multiple uses compatible with financial obligations of trust management.
- RCW 79.10.125 Land open to public for fishing, hunting, and non-consumptive wildlife activities.
- RCW 79.36.440 Right-of-way for public roads.
- RCW 79.36.510 Utility pipe lines, transmission lines, etc.
- RCW 79.36.520 Utility pipe lines, transmission lines, etc. – Procedure to acquire.
- RCW 79.36.530 Utility pipe lines – Appraisal – Certificate – Reversion.
- RCW 79.38.040 Permits for use of roads.

Consistency: As described above, BPA is committed to planning its transmission line projects to be consistent or compatible with existing land uses to the extent practicable. Mitigation measures identified to reduce potential impacts on landowners and their lessees are provided in Chapter 5, Land, and Chapter 11, Socioeconomics.

28.2.7 Fish and Wildlife

- Policy 08-032: The department will recognize the natural resource values of riparian zones and implement management plans to maintain or enhance these zones.
- Policy 08-033: The department will avoid effects on plant and animal species considered endangered. Within trust management obligations, the department will avoid adverse effects on species considered threatened, and consider avoiding or lessening effects on species considered sensitive.
- Policy 14-009: The department will meet the requirements of federal and state laws and contractual requirements that protect endangered, threatened and sensitive species and their habitats.
- Policy 14-011 In Western Washington, the department will maintain or restore salmonid freshwater habitat on department-managed lands and contribute to the conservation of other aquatic and riparian obligate species through implementation of WDNR's HCP.

Consistency: As described above under consistency with EFSEC standards, BPA attempts to avoid impacts on fish and wildlife species where possible. Chapter 18, Wildlife, and Chapter 19, Fish display the listed and proposed species that are either known to occur or have the potential to occur in the project area, and also discuss the project's potential impacts on wildlife and fish, and mitigation measures to minimize those impacts. Due to the required safe operation of the transmission line, BPA must remove tall-growing vegetation in riparian zones. BPA is developing prescriptions in important riparian zones that are consistent with the Vegetation Management Program and transmission line safety, but that may allow more vegetation to be kept that provides important riparian function.

28.2.8 Transportation and Access

Policy 14-020 pertaining to forest roads in WDNR's Policy Manual (WDNR 2005) states the following:

- The department will develop and maintain forest roads to meet trust objectives and Board of Natural Resources policy, including protecting and enhancing the asset value.
- To minimize adverse environmental impacts, the department will rely on the requirements of WDNR's HCP, state forest practices rules and the State Environmental Policy Act, and will minimize the extent of the road network, consistent with other Board of Natural Resources policy.

In response to WDNR's policy and in order to achieve the regulatory requirements under Washington Forest Practices Act, a comprehensive discussion of WDNR standards for roads designed, constructed, maintained, and abandoned on state-managed lands was developed in WDNR's Forest Roads Guidebook (WDNR 2011a). Three general management practices characterize a small portion of the objectives and standards outlined in the Forest Roads

Guidebook, but are representative of the considerations WDNR must make when adding a new road to the overall transportation system:

- Build no more new road than is necessary to accomplish and economically conduct harvest and/or management objectives for the basic plan of operations, regardless of whether a road is in sensitive areas or not.
- The protection of sensitive species and areas including, but not limited to, streams and watersheds is vital. Proper logging methods, road locations and construction techniques must be considered to mitigate a potential increase in erosion from forest areas and sediment delivery to surface water.
- Consider the overall transportation plan for a geographic area. Plan new roads that take into account transportation plans and needs for future sales and access. This will avoid construction of parallel roads or extra lengths of roads to access far corners that will be harvested in the future.

Consistency: The action alternatives cross WDNR-managed state lands where trees could be removed for new or improved roads. BPA has worked closely with WDNR to identify existing roads that could be used by BPA for construction and operation and maintenance of the project since many already exist on WDNR land and are used by WDNR mostly for logging. BPA and WDNR have determined trade-offs between identifying new roads that may minimize impacts on environmental resources and improving existing roads. BPA continues to work closely with WDNR to ensure that roads are sited in consideration of all existing and planned uses and environmental resources, existing access roads are improved appropriately, and crossing structures are identified and sized appropriately.

28.2.9 Washington's Forest Practices Act and Rules

WDNR's Forest Practices Program is responsible for the implementation of the state's Forest Practices Act and rules (Chapter 76.09 RCW and Chapter 222 WAC). The rules provide the framework for the protection of public resources on all state and private forest land and are a responsibility of forest landowners, timber owners and operators when conducting forest practices activities.

Consistency: Portions of all alternatives cross state or private lands managed for forest or timber and which are governed under the Forest Practices Act and Rules. Proposed amounts of timber removed on WDNR land is included in Appendix A. Trees would be removed within and outside of existing and planned right-of-way (danger trees). BPA continues to work closely with WDNR to identify the types and amounts of trees that need to be removed and where and how placement of right-of-way, towers, and roads might minimize interference with existing and planned timber harvests and practices. BPA also continues to work with WDNR to type streams, understand and identify riparian buffers and impacts, and identify mitigation.

28.2.10 State-Owned Aquatic Lands

WDNR is currently in negotiations with USFWS and NOAA Fisheries to develop an Aquatic Lands HCP which will cover aquatic lands under water bodies, including those proposed to be crossed by the project. Final conservation measures may change from those listed below once the Aquatic HCP is negotiated and approved and the Incidental Take Permit is developed for covered species and vegetation.

Under the draft HCP, the following draft conservation measures are proposed to be implemented on a case-by-case basis as site-specific conditions warrant.

- Protection of Submerged Native Aquatic Vegetation. WDNR has identified freshwater and marine vegetation species to be protected. New activities must avoid existing freshwater native aquatic vegetation identified in the project area (see list of freshwater and marine vegetation species to be protected provided by WDNR Aquatic Lands HCP, November 2012). BPA has identified aquatic plants at SOAL crossings along the Preferred Alternative and has included this list in Appendix A.
- Species Work Windows. For the crossings listed in the Columbia, Coweeman, Kalama, Lewis, and Washougal rivers, WDFW species in-water work windows must be used for the timing of any construction, operation or maintenance activities, to protect listed and sensitive species and forage fish species in sensitive live history phases (see Listed and Sensitive Species provided by WDNR Aquatic Lands HCP, November 2012).
- Maintenance and Decommissioning. Lessees and grantees must remove unused, abandoned structures, and equipment from the lease or easement site. A timeframe for removal will be specified in the authorizing document.

Consistency: The action alternatives cross State Owned Aquatic Lands along the Columbia, Camas Slough, Cowlitz, Coweeman, Kalama, Lewis, East Fork Lewis, and Washougal rivers. Within the ordinary high water mark (OHWM), two existing towers would be removed and two new towers would be constructed in the existing right-of-way in the Columbia River on Ione Reef (see Chapter 3, Project Components). On Lady Island along the Camas Slough and within the OHWM, one existing tower would be removed and replaced with a new tower. On the east bank of the Washougal River and within the OHWM, two existing towers would be removed and replaced with two new towers. A few additional towers would be removed and replaced close to rivers but outside of the OHWM. Most structures would be at least 200 feet from the edge of river banks. No towers, other than the ones already described, or new or improved access roads would be placed in rivers. Depending on type and height, riparian vegetation would be removed along the rivers for safe operation of the line and development of access roads to towers. BPA continues to work closely with WDNR to identify the types and amounts of trees that need to be removed and how placement of the right-of-way, towers, and roads might minimize riparian clearing and potential impacts to aquatic species and other aquatic resources and activities.

28.2.11 Public Health and Safety

- The provisions of Chapter 332-24 WAC and Chapter 76.04 RCW shall apply to forest protection measures and operator responsibilities related to fire prevention and fire hazard abatement.

Consistency: BPA is committed to reducing the potential for fire during construction. Chapter 10, Public Health and Safety identifies mitigation measures to minimize potential health and safety risks from fire.

28.3 Washington Department of Fish and Wildlife Standards

WDFW serves as the state's principal agency on species protection and conservation. Legislative mandate RCW 77.04.012 established that wildlife, fish, and shellfish are property of the state and that WDFW is entrusted by and through the Fish and Wildlife Commission to "preserve, protect, perpetuate, and manage the wildlife and food fish, game fish, and shellfish" and "attempt to maximize the public recreational game fishing and hunting opportunities of all citizens."

In 2003, WDFW and a broad range of wind power stakeholders developed the WDFW Wind Power Guidelines (WDFW 2009a) to provide consistent statewide direction for development of land-based wind energy projects still protecting the state's wildlife and habitat. The guidelines were revised in 2009. Although the project is not a wind energy project, guidelines for impact avoidance and minimization that are potentially applicable to the project are included in the sections below.

28.3.1 Wildlife

- Where appropriate, develop in agricultural and other disturbed lands, including using existing transmission corridors and roads where possible.

Consistency: Where feasible, BPA typically considers transmission line alternatives that use existing rights-of-way or are routed across already disturbed areas such as agricultural lands, and attempts to use existing roads where possible. Chapters 2 through 4 discuss alternative development and placement of roads, and Chapter 5 provides information on potential impacts on land uses.

- Avoid high bird and bat aggregation areas, and areas used by sensitive status species.
- Encourage the protection of priority habitats and species.

Consistency: BPA attempts to route transmission lines away from high bird and bat aggregation areas and sensitive species' habitat where possible; however, because new lines most often extend from one specific area to another, route locations can be limited. Chapter 18, Wildlife describes the project's potential impacts on wildlife and mitigation measures identified to minimize those impacts.

- Minimize use of overhead collector lines, unless underground collector lines are not appropriate or feasible due to environmental conditions (e.g., topography, soil conductivity, environmental impacts, etc.).

Consistency: BPA would not construct collector lines for the project. Undergrounding of high-voltage (230- and 500-kV) transmission lines is usually not an option because of the greater environmental impacts and costs of undergrounding. Section 4.7, Alternatives Considered but Eliminated from Detailed Study, of this EIS provides information on alternatives eliminated from detailed consideration and Appendices D and D1 include the more detailed underground route studies.

- When overhead lines are used, use designs that avoid and minimize impacts to raptors and other birds (refer to APLIC guidelines regarding adequate conductor spacing and use of perch guards).

Consistency: BPA always designs conductor spacing to comply with Avian Power Line Interaction Committee guidelines (see Section 3.3, Conductors, of this EIS). BPA has also worked with WDFW to identify river crossing and spans where bird flight diverters may be installed.

- Use tubular towers to reduce the likelihood that birds will perch on towers and to possibly reduce the risk of collision. Avoid use of lattice towers, particularly those with horizontal cross-members.

Consistency: The industry standard design for towers for high-voltage transmission lines is steel lattice towers. This design also minimizes cost. Chapter 3, Project Components, provides information on the design of the proposed transmission line.

- Avoid using permanent tower types that employ guy wires. If guy wired towers are approved, encourage the requirement of bird flight diverters on the guy wires.

Consistency: BPA typically does not use guy wires on towers for its high-voltage transmission lines. In the event that guy wires are necessary, BPA would consider placing bird flight diverters on the guy wires if it is compatible with the tower design. Chapter 18 describes the proposed mitigation measures identified to minimize impacts on birds.

- Discourage the use of rodenticides to control rodents burrowing around towers.

Consistency: BPA does not use rodenticides.

- Minimize the use of lights on towers and facilities structures, in accordance with federal, state, and local requirements.

Consistency: BPA typically only uses lights on very tall towers (such as at river crossings) and towers near airports/heliports, in compliance with FAA requirements. Chapter 3 provides a discussion of tower lighting design and potential locations.

- Control noxious weeds in accordance with federal, state, and local laws.
- Encourage the control of noxious weeds that may occur from project disturbance.

Consistency: BPA controls weeds in accordance with federal laws, and also follows applicable state and local weed control laws to the extent practicable. Chapter 17, Vegetation, discusses proposed mitigation measures to reduce or eliminate the potential for the spread of noxious weeds under the action alternatives.

- Encourage the permitting authority to require a fire protection plan and a complete road siting and management plan that includes vehicle-driving speeds that minimize wildlife mortality.

Consistency: Because BPA is not subject to state or county permitting authorities, this guideline does not apply to the project. However, Chapter 10, Public Health and Safety does include

proposed mitigation for the safe operation of vehicles and construction equipment, and the development of safety plans that incorporate the underlying landowners existing safety plans.

- Minimize roads and stream crossings.

Consistency: BPA typically proposes to build or improve the minimum amount of roads needed to access the transmission line and avoid stream crossings where possible. Section 28.2.8, Transportation and Access, of this chapter, provides information on BPA's commitment to work with WDNR on access roads.

28.4 Washington State Department of Ecology Standards

The Washington State Department of Ecology (Ecology) is the state agency responsible for protecting air and water quality in the state of Washington, including management of shorelines and wetland areas and implementation of federal and state water pollution control laws and regulations.

28.4.1 Shorelines and Wetlands

The Coastal Zone Management Program is authorized by the Coastal Zone Management Act of 1972 and administered at the federal level by the National Oceanic and Atmospheric Administration's Office of Ocean and Coastal Resource Management, Coastal Programs Division. Management of the program is delegated to the states participating in the program. In Washington, Ecology administers the program. The Coastal Zone Management Act requires federal development projects and activities directly affecting the coastal zone "shall be conducted in a manner which is, to the maximum extent practicable, consistent with approved state management programs" (Section 307(c)(1), (2)).

A federal agency or applicant for a federal license, permit, or financial assistance is responsible for determining whether the proposed activity may affect any natural resource, land use, or water use in Washington's coastal zone. Ecology will concur with a determination if the federal activity is consistent to the maximum extent practicable with the Washington Coastal Zone Management Program. Consistency with the state program is described below.

The Washington State Shoreline Management Act (the Act) establishes a planning program and regulatory permit system initiated at the local level under state guidance. Ecology is designated as the lead state agency, and local governments exercise primary authority for implementing the Act. Each local government's master program consists of a shoreline inventory and a "shoreline master program" (SMP) to regulate shoreline uses. The SMP for Clark County, adopted in September 2012 as Chapter 13 of the Clark County Comprehensive Plan, and Cowlitz County, adopted in 1977 regulates land uses affecting shorelines of the state. The proposed transmission facilities would impact state shorelines if the towers or access roads would be located within 200 feet of them or their associated wetlands.

Regulations pertaining to utilities are listed in Section 16 of the Act. Utility services in shoreline areas designated Conservancy, Rural, and Urban Environments, shall be permitted subject to the following regulations:

- All utility systems shall be underground when such undergrounding is economically feasible.
- All clearing for installation of maintenance shall be kept to the minimum width necessary.
- Upon completion of the installation of utility systems or of any maintenance, disturbed areas shall be restored as nearly as practical to the pre-existing condition.
- Utilities shall be located above flood levels wherever practical.

Consistency: The action alternatives would cross the Columbia River, Camas Slough, Lewis River, East Fork Lewis River, Coweeman River, Cowlitz River, Washougal River, Kalama River, and many other creeks and streams, and wetlands identified in Chapter 15, Water and Chapter 16, Wetlands. Towers and access roads would be placed as far from the water's edge as feasible to avoid floodplains; however, some towers and access roads would be placed within floodplains and within 200 feet of the shoreline. Clearing would be kept to a minimum; however, all tall-growing vegetation in the right-of-way would need to be removed for safe operation of the line. Exceptions to this would be in deep canyons or draws. Disturbed areas would be reseeded. Chapters 15 and 16 discuss mitigation measures identified to reduce potential impacts on water and wetlands. Appendix O discusses substantive compliance with the Act in more detail for the Preferred Alternative.

Section 401 consistency with the Clean Water Act for fill or pollutant discharge into waters of the United States including wetlands is a requirement and is discussed in Section 28.1.7, Water Quality, of this chapter.

Isolated wetlands are considered by the Corps to be those wetlands that are not adjacent to or do not have a surface water connection to navigable waters of the United States, such as streams, rivers, lakes or marine waters. The Corps determines whether a wetland meets federal definition for being isolated. In 2001, a U.S. Supreme Court ruling (Solid Waste Agency of North Cook County v. United States Army Corps of Engineers et al., also known as the SWANCC decision) determined that isolated wetlands are no longer subject to the regulation of Section 404 of the CWA. Although not protected under federal law, isolated wetlands are still protected at the state level by Ecology through the State Water Pollution Control Act (Chapter 90.48 RCW).

Because isolated wetlands can perform many of the same ecological functions as other wetlands, the state Water Pollution Control Act makes no distinction between isolated versus other wetlands meeting the federal definition. Instead, all "waters of the state" are covered by the Act. According to Ecology, "waters of the state" include all marine waters, streams, rivers, lakes, ponds, springs, and wetlands. Any activity that may cause pollution, including discharge of fill or other alteration of the physical, chemical or biological properties of isolated wetlands is subject to regulation under the Water Pollution Control Act. The standards of review are the "state water quality standards for surface waters of the state of Washington" (WAC 173-201A) equivalent to the standards required for 401 water-quality certification. If the Corps determines that a wetland is isolated and not within its jurisdiction, impacts to the isolated wetland in Washington would need to be authorized by Ecology through an Administrative Order.

Consistency: BPA is working with Ecology to determine if isolated wetlands would be impacted by project alternatives in Washington. If impacts are proposed, BPA would obtain authorization from Ecology and implement compensatory mitigation.

In 2005, Ecology published a synthesis of the science related to freshwater wetlands in Washington. This publication included two volumes which outline Ecology recommendations for wetland buffers and protection measures: 1) Wetlands in Washington, Volume 1 – A Synthesis of the Science (Publication #05-06-006); and 2) Volume 2 – Guidance for Protecting and Managing Wetlands (Publication #05-06-008). These documents provide guidance for protection of wetlands in Washington based upon the scores derived from the 2004 wetland rating system (Hruby, 2004). Wetlands identified within the Preferred Alternative have been rated using the 2004 wetland rating system.

Ecology has developed wetland buffer width recommendations and alternatives taking into account several environmental factors including: 1) wetland category, 2) habitat score, 3) land use intensity, and 4) special characteristics (e.g., bog, forested, natural heritage site, etc.). Using Buffer Alternative 3, the buffer recommendations are summarized in Tables 8C-7 of Appendix 8-C in Volume 2. According to the guidance document, "utility corridor or right-of-way shared by several utilities and including access/maintenance roads" is considered to be of "moderate land use." Standard wetland buffers recommended for "moderate land use" using Alternative 3 are summarized below.

Table 28-2 Standard Buffer Width Recommended for Wetlands with Moderate Land Use Intensity, Buffer Alternative 3, Appendix 8-C in Volume 2 – Guidance for Protecting and Managing Wetlands (2005)

Wetland Category	Wetland Characteristics	Buffer Width (feet) for Moderate Land Use
Category I	High habitat score (29-36 points)	225
	Moderate habitat score (20-28 points)	110
	High water quality score (24-32 points); low habitat score (less than 20)	75
	Not meeting above characteristics	75
Category II	High habitat score (29-36 points)	225
	Moderate habitat score (20-28 points)	110
	High water quality score (24-32 points); low habitat score (less than 20)	75
	Not meeting above characteristics	75
Category III	Moderate habitat score (20-28 points)	110
	Low habitat score (less than 20 points)	60
Category IV	Score for all 3 basic functions is less than 30 points	40

In October 2013, Ecology published an *Update on Wetland Buffers: the State of the Science* (Publication #13-06-11). This document generally reaffirmed the science behind the buffer recommendations by wetland category and habitat features outlined above.

Consistency: BPA is working with Ecology to determine wetland buffer widths for wetlands potentially impacted by action alternatives in Washington.

28.4.2 Water Quality

The following Ecology substantive standards from Chapter 90.48 RCW, Chapter 173-216 WAC, Chapter 173-220 WAC, Chapter 173-200 WAC, and Chapter 173-201A WAC are potentially applicable to the proposed project:

- Proper erosion and sediment control practices must be used on the construction site and adjacent areas to prevent upland sediments from entering surface water. All ground disturbances by construction activities must be stabilized. When appropriate, use native vegetation typical of the site.
- Any operation which would generate a waste discharge or have the potential to impact the quality of state waters, must receive specific prior authorization from Ecology.
- Routine inspections and maintenance of all erosion and sediment control BMPs are recommended both during and after development of the sites.
- A SWPPP for the project site may be required and should be developed by a qualified person(s). Erosion and sediment control measures in the plan must be implemented prior to any clearing, grading, or construction. These control measures must be effective to prevent soil from being carried into surface water by stormwater runoff. Sand, silt, and soil can damage aquatic habitat and are considered pollutants. The plan must be upgraded as necessary during the construction period.
- Proper disposal of construction debris must be in such a manner that debris cannot enter the natural stormwater drainage system or cause water quality degradation of surface waters. Dumpsters and refuse collection containers shall be durable, corrosion resistant, nonabsorbent, water tight, and have close fitting covers. If spillage or leakage does occur, the waste shall be picked up immediately and returned to the container and the area properly cleaned.
- The operator of a construction site that disturbs one acre or more of total land area, and which has or will have a discharge of stormwater to a surface water or to a storm sewer, must apply for coverage under Ecology's NPDES Construction Stormwater General Permit.

Consistency: Water quality standards are discussed in Chapter 27, Consultation, Review, and Permit Requirements. BPA seeks appropriate certifications and authorizations from state water quality regulatory agencies and will meet all applicable standards identified through this process to protect water quality. Chapters 14, Geology and Soils, and 15, Water, provide information on the project's potential impacts on soils and water quality, and identify mitigation measures that would reduce potential impacts. Section 401 certification of consistency with the Clean Water Act for fill or pollutant discharge of waters of the United States is a requirement and is discussed in Section 28.1.7, Water Quality, and in Chapter 27, Consultation, Review, and Permit Requirements.

28.4.3 Air Quality

Ecology substantive standards from Chapter 42.21A RCW and Chapter 173-400 WAC related to general regulations of air pollution sources establish attainable standards and rules applicable to control or prevention of emissions of air contaminants. Ecology suggests the development of a Fugitive Dust Control Plan (FCDP) to identify project-related fugitive dust sources,

implementation procedures for dust abatement, and how dust control measures will comply with applicable provisions outlined in WAC 173-400-040.

Consistency: See Chapter 14, Geology and Soils and Chapter 21, Air Quality for a discussion of dust and air quality impacts and for mitigation measures to control emissions and fugitive dust. The Federal Construction General Permit that applies to federal projects directs the NPDES permit holder to address dust control within the Stormwater Pollution Prevention Plan that will be prepared for this project. BPA directs its contractors to use the regionally appropriate BMPs from the Western or Eastern Washington Stormwater Manual, in particular BMP C140 which outlines design and installation specifications for dust control.

28.5 Washington State Department of Archaeology and Historic Preservation Standards

The Department of Archaeology and Historic Preservation works with agencies, Tribes, private citizens, and developers to identify and develop protection strategies to ensure that Washington's cultural heritage is not lost. In Washington, archaeological sites and Native American graves are protected from known disturbance by a variety of state laws. Federal law applies to all federal and Native American lands, and Washington state law applies to all other lands. The following state laws on archaeology and historic preservation for the management of cultural resources are potentially applicable to the I-5 Project:

- Indian Graves and Records (RCW 27.44)
- Archaeological Sites and Resources (RCW 27.53)
- Archaeological Excavation and Removal Permit (WAC 25-48)
- Abandoned and Historic Cemeteries and Historic Graves (RCW 68.60)
- Advisory Council on Historic Preservation (WAC 25-12)

Consistency: As discussed in Chapter 13, Cultural Resources, Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties. If a federal agency plans to undertake a type of activity that could affect historic properties, it must consult with the appropriate State Historic Preservation Officer to make an assessment of adverse effects on identified historic properties. BPA would comply with NHPA and all applicable state laws.

28.6 Oregon Department of Energy

The Oregon Department of Energy (ODOE) is the state agency responsible for overseeing the development of large energy facilities in Oregon. A proposed facility must undergo a review process before the Oregon Energy Facility Siting Council (EFSC) that meets the siting standards before being issued a site certificate, which authorizes a developer to construct and operate an energy facility. BPA's transmission lines are not subject to EFSC's siting jurisdiction. Nonetheless, BPA will seek to be consistent with EFSC's substantive standards to the extent practicable.

The following substantive standards from Oregon Administrative Rules (OAR) Chapter 345, Division 22 and Division 24 are potentially applicable to the project:

28.6.1 Soil and Geologic Resources

- The provisions in OAR 345-022-0022 require that applicants consider potential impacts to soil resources.
- The provisions in OAR 345-022-0020 require that applicants design, engineer, and construct proposed facilities to avoid dangers to human safety presented by seismic hazards expected to result from maximum probably ground motion events.

Consistency: BPA would apply seismic standards applicable to transmission line and substation construction in its design specifications for the proposed transmission line (see Chapter 14, Geology and Soils).

28.6.2 Land Use

- The provisions in OAR 345-022-0030 ensure that proposed energy facilities will comply with Oregon's land use planning goals adopted by the Land Conservation and Development Commission (LCDC).
- EFSC must decide whether the proposed energy facility complies with LCDC rules and goals directly applicable to the facility under ORS 197.646(3).

Consistency: BPA is committed to planning its transmission line projects to be consistent or compatible with existing land uses to the extent practicable. Chapter 5, Land provides a discussion of mitigation measures identified to reduce potential impacts on land use and ownership.

28.6.3 Fish and Wildlife Habitat

- The provisions in OAR 345-022-0060 require that proposed facilities comply with habitat mitigation goals and standards of ODFW.
- The provisions in OAR 345-022-0070 require that applicants provide appropriate studies that identify state-listed threatened or endangered species that could be affected by the proposed energy facility. Applicants should consult with the Oregon Department of Agriculture (ODA) and ODFW.

Consistency: In designing its projects, BPA attempts to avoid impacts on fish and wildlife species where possible. Field surveys were conducted as needed in spring 2014, 2015, and will continue in 2016 to confirm the presence and/or absence of listed species in the project area. Potential impacts on ESA-listed species and state-listed species and priority habitat are discussed in Chapter 18, Wildlife and Chapter 19, Fish. These chapters also discuss potential effects to state-listed species and priority habitat and species, and recommend measures to mitigate impacts to species and habitat.

28.6.4 Visual Resources

The provisions in OAR 345-022-0080 (Scenic Resources) protect scenic values that local land use or federal management plans identify as significant or important. Proposed facilities affecting scenic values identified as significant must propose appropriate measures to reduce impacts.

Consistency: Chapter 7, Visual Resources, provides a discussion of impacts on visual resources and mitigation measures to lessen those impacts.

28.6.5 Historic, Cultural, and Archaeological Resources

- The provisions in OAR 345-022-0090 protect public interest in preserving historic, cultural, or archaeologically significant places. Applicants must conduct appropriate surveys to identify and avoid places of potential significance. If the project involves construction on an archaeological site, the applicant may need a permit from the SHPO.

Consistency: As discussed in Chapter 27, Consultation, Review, and Permit Requirements, BPA seeks to comply with all applicable laws and other directives for the management of cultural resources. Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to take into account the effects of their undertakings on historic properties on all lands affected by proposed projects. Through the evaluation of this project in this EIS (see Chapter 13, Cultural Resources) and compliance with the Section 106 process and other review requirements, BPA will act consistently with ODOE's potentially applicable cultural resource policies.

28.6.6 Recreation

- The provisions in OAR 345-022-0100 require evaluation of potential impact to recreational opportunities at the construction site or in the surrounding area. If significant impact is likely, the Council may require avoidance or mitigation measures to reduce impact to recreational opportunities.
- Impacts to protected state and national areas specified in OAR 345-022-0040 will be sufficiently mitigated to less than significant impact.

Consistency: Chapter 6, Recreation describes impacts on recreation areas in the project area and mitigation measures to lessen those impacts.

28.6.7 Socioeconomics

- The provisions in OAR 345-022-0110 require applicants to assess proposed facility needs for water, wastewater disposal, storm water, and solid waste. Expected population increases, impacts to housing, traffic safety, police, and fire protection, heath care and schools must also be analyzed for expected temporary and permanent impacts.

Consistency: Chapter 11, Socioeconomics describes potential impacts on socioeconomics for the project and mitigation measures to lessen those impacts.

28.6.8 Public Health and Safety

- ORS Chapter 467.020 and 467.030 relate to Oregon Department of Environmental Quality (ODEQ) noise regulation for energy facilities. OAR 340-035-0035 establishes noise control regulations for industry and commerce, including energy facilities.
- No person owning or controlling a new industrial or commercial noise source located on a previously unused industrial or commercial site shall cause or permit the operation of that noise source if the noise levels generated or indirectly caused by that noise source increase the ambient statistical noise levels, L10 or L50, by more than 10 dBA in any one hour, or exceed the levels specified in Table 28-1.
- Provisions in OAR 345-022-0120 require applicants to plan to minimize solid waste and wastewater generated during construction and operation of the proposed facility. Applicants must propose methods to handle waste through collection, storage and disposal.
- The applicant should consult with DEQ to list all hazardous materials potentially stored or used at the facility site during construction and operation as well as ensure compliance with Oregon Revised Statutes) (ORS) Chapters 465 and 466 related to use, clean up, and disposal of hazardous materials.

Consistency: BPA would comply with all applicable state regulations concerning the generation, storage, transportation, treatment or disposal of dangerous wastes during construction and maintenance of the proposed transmission line (see Chapter 10, Public Health and Safety). BPA also would conduct project construction activities in conformance with DEQ standards for maximum permissible noise levels using appropriate muffling devices on construction equipment and limiting construction to daytime and evening hours (see Chapter 9, Noise).

28.6.9 Air Quality

- Provisions in OAR 345-024-05000 provide specific standards for base load gas plants, non-base load power plants, and non-generating energy facilities that emit carbon dioxide. The following limitations are in place:
    - Base load gas plants 0.675 lb. CO_2 / kWh
    - Non-base load gas plants 0.675 lb. CO_2 / kWh
    - Non-generating facilities 0.504 lb. CO_2 / horsepower-hour

Consistency: To the extent that air emissions resulting from construction and maintenance of the project are regulated under state law, the project would comply with these regulations (see Chapter 21, Air Quality). Vehicle use during operation and maintenance of the transmission line and substations would result in annual emissions below EPA's mandatory reporting threshold, as described in Chapter 21. There are no applicable air emissions standards for actual project operation.

28.6.10 Water Resources

- The Oregon Department of State Lands and the U.S. Army Corps of Engineers have a joint application process for issuing permits for work conducted within waters of the State. ODSL will require a removal-fill permit if 50 cubic yards or more of material is removed, filled or altered within a jurisdictional water of the State. The removal-fill

permit will be issued separately from the 404 permit issued by the U.S. Army Corps of Engineers.

- A Limited Water Rights permit is required if new water rights are necessary for the project.

Consistency: Through its compliance with the CWA, BPA seeks appropriate certifications and authorizations from state water quality regulatory agencies for its proposed projects. BPA will meet all applicable standards identified through this process to protect water quality from construction and operation of the proposed transmission line, substations, and access roads. In designing its projects, BPA attempts to avoid identified wetland areas where feasible. If wetlands cannot be avoided, BPA works to minimize potential impacts and compensate appropriately for unavoidable impacts. BPA would act consistently with standards related to wetlands during construction and operation and maintenance of the project. Chapter 15, Water and Chapter 16, Wetlands provide additional information concerning the project's potential impacts on water quality, and Chapter 27, Consultation, Review, and Permit Requirements provides information concerning BPA's CWA compliance activities.

Chapter 29 References

This chapter lists the works cited in this EIS, and other works consulted to prepare this EIS.

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John Edgerly, E.I.T. – Water Resources Engineer, Golder Associates Inc. Contributor to water resource analysis and EIS chapter. Education: M.S. Civil Engineering (Water Resources). Years of experience: 6.

Carl Einberger, L.Hg. L.E.G. – Senior Consultant, Water Resources, Golder Associates Inc. Contributor to water resource analysis and EIS chapter. Education: M.S. Geology (Hydrogeology). Years of experience: 23.

Crystal Elliot – Staff Ecologist, Herrera Environmental Consultants. Contributor to vegetation resource analysis and EIS chapter. Education: M.S. Ecosystem Science. Years of experience: 9.

Michele Fesler – NEPA Specialist, Golder Associates Inc. Contributor to land and visual resources analyses and EIS chapters. Education: B.A. International Relations: Development Economics; M.S. Civil Engineering. Years of experience: 20.

Kittie Ford – Natural Resource Principal, Herrera Environmental Consultants. Contributor to vegetation and wildlife resource analyses and EIS chapters. Education: M.U.P. Natural Resources Planning. Years of experience: 26.

Phil Gaskill – Science Writer, Cramer Fish Sciences. Contributor to fish resource analysis and EIS chapter. Education: B.A. History. Years of experience: 5.

Isla Globus-Harris – Analyst, ECONorthwest. Contributor to socioeconomics resource analysis and EIS chapter. Education: B.A. Mathematics and Economics. Years of experience: 1.

Neil R. Gilham, LG. – Senior Environmental Geologist, Golder Associates Inc. Contributor to public health and safety resource analysis and EIS chapter. Education: B.S. Geology. Years of experience: 23.

Wilcox Gleasman – Senior Analyst, ECONorthwest. Contributor to socioeconomics resource analysis. Education: B.S. Economics. Years of Experience: 3.

Teddy Hammond – GIS Analyst, Golder Associates Inc. Responsible for GIS support. Education: B.A. Geography. Years of experience: 3.

Daryl Harrison – Visual and Land Use Assessment Specialist. Contributor to visual resource analysis and EIS chapter. Education: B.A. Geography, Adv. GIS. Years of experience: 10.

Kara Hempy-Mayer – Environmental Protection Specialist, CIBER, Inc. Contributor to wildlife and vegetation analyses and EIS chapters. Education: B.S. Plant Biology; M.S. Botany and Plant Pathology. Years of experience: 6.

Michael Henjum – Environmental Engineer, BPA. Contributor to greenhouse gas resource analysis and EIS chapter. Education: B.S. Chemical Engineering; M.S. Environmental Engineering. Years of experience: 3.

Judith Hillis – Senior Environmental Scientist, Ecologist, Golder Associates Inc. Contributor to wetlands and vegetation resource analyses and EIS chapters. Education: B.S. Botany and B.S. Ecology, Evolution, and Conservation Biology. Years of experience: 16.

Makary Hutson – Biological Scientist, BPA. Contributor to greenhouse gas resource analysis and EIS chapter. Education: B.S. Biology. Years of experience: 3.

Heather Jackson – Senior GIS Analyst, Golder Associates Inc. Responsible for GIS support. Education: B.A, Geography; M.A. Geography. Years of experience: 10.

Emmanuel Jaramillo – Project Manager, BPA. Responsible for management of the project including schedule, cost, and scope that pertains to the new substation and existing substations. Education: B.S. Electrical Engineering. Years of experience: 9.

Mike Johns, P.E. – Civil Engineer, MBO Partners. Responsible for line routing and design coordination with agencies and landowners. Education: B.S. Civil Engineering. Years of experience: 38.

Andreas Kammereck, P.E. – Associate Engineer, Golder Associates Inc. Contributor to water resource analysis and EIS chapter. Education: M.S. Civil Engineering (Water Resources). Years of experience: 15.

Andrew Kenny – Analyst, ECONorthwest. Contributor to socioeconomics resource analysis and EIS chapter. Education: B.A. Economics. Years of experience: 2.

Mark A. Korsness, P.E. – Project Manager, BPA. Transmission Engineering. Education: B.A. Geology; B.S. Civil Engineering. Years of experience: 30.

Laura Lehman – Land Use Planner, Golder Associates Inc. Contributor to land and recreation resource analyses and EIS chapters. Education: B.S. Ecology, M.S. Environmental Science and Management. Years of experience: 5.

Kris Lepine – Associate Ecologist, Herrera Environmental Consultants. Contributor to vegetation and wildlife resource analyses and wildlife EIS chapter. Education: B.S. Environmental Science. Years of experience: 12.

Danna Liebhaber – Engineer, BPA. Contributor to noise and EMF analyses and EIS chapters. Education: B.S. Electrical Engineering. Years of experience: 9.

Zachery Lifton, Ph.D. – Geologist, Golder Associates Inc. Contributor to geology and soils resource analysis and EIS chapter. Education: B.A. Geology, M.S. Geology, Ph.D. Earth Sciences. Years of experience: 10.

Lisa MacLellan - Physical Scientist, BPA. Responsible for assisting the environmental lead with project coordination activities. Education: B.A. Environmental Policy and Planning; M.S. Environmental Science. Years of Experience: 3.

Ed MacMullan – Senior Economist, ECONorthwest. Contributor to socioeconomics resource analysis. Education: M.S. Agricultural Economics and International Agricultural Development. Years of experience: 27.

Elizabeth Malliris – Writer/Editor, Words by Malliris. Contributing editor and writer of Health Effects Report and EIS. Education: B.A. Journalism. Years of experience: 22.

Claire McClory – Environmental Protection Specialist, BPA. Responsible for assisting the environmental lead with project coordination activities. Education: B.A. Environmental Science; M.U.E.P. Urban and Environmental Planning. Years of experience: 5.

Alexander McKenzie-Johnson, L.G., L.E.G. – Geologist, Golder Associates Inc. Contributor to geology and soils resource analysis and EIS chapter. Education: B.S. Geology; M.S. Geology. Years of experience: 9.

Alyssa Neir – Environmental Planner, Golder Associates Inc. Contributor to land use, recreation, and environmental justice resource analyses and EIS chapters. Education: M.W.R. Water Resources; B.A. Urban Studies and Environmental Studies. Years of experience: 5.

Ernie Niemi – Senior Economist, ECONorthwest. Contributor to socioeconomics resource analysis and EIS chapter. Education: M.C.R.P. Urban Planning and Public Policy. Years of experience: 36.

Terry Ozbun – Senior Archaeologist, Archaeological Investigations Northwest, Inc. Contributor to cultural resource analysis and cultural resources EIS chapter. Education: M.A. Anthropology. Years of experience: 31.

Brian Patterson, Ph.D. – Associate and Senior Consultant, Golder Associates Inc. Contributor to climate resource analysis and EIS chapter. Education: Ph.D. Physical Chemistry. Years of experience: 20.

Sarah Reich – Policy Analyst, ECONorthwest. Contributor to socioeconomics resource analysis and EIS chapter. Education: M.A. Urban and Environmental Policy and Planning. Years of experience: 8.

Anthony Rice – Geotechnical Engineer, Golder Associates Inc. Technical reviewer of geology and soils resource analysis. Education: B.A.Sc. Geological Engineering; M.A.Sc. Civil Engineering. Years of experience: 28.

Ruben Rodriguez – GIS Technician, Herrera Environmental Consultants. Contributor to vegetation and wildlife resource analyses and EIS chapters. Education: B.A. Geography. Years of experience: 3.

Leroy Sanchez – Visual Information Specialist, VOLT Workforce Solutions, Inc. Responsible for EIS graphics, and visual aids. Education: Graphic Design coursework. Years of experience: 41.

Tom Souhlas – Policy Analyst, ECONorthwest. Contributor to socioeconomics resource analysis and EIS chapter. Education: M.Sc. Environment and Development. Years of experience: 5.

Kimberly St. Hilaire – Environmental Protection Specialist, BPA. Contributor to wetlands, vegetation, and wildlife resource analyses and EIS chapters. Education: B.S. Biology, M.S. Teaching Biology, J.D. Environmental Law. Years of experience: 20.

Peter M. Stevens – Senior Fisheries Biologist, Cramer Fish Sciences. Contributor to fish resource analysis. Education: B.A. Biology and Environmental Science; M.S. Natural Resources: Fisheries Sciences. Years of Experience: 10.

Mark Teply – Senior Scientist, Cramer Fish Sciences. Contributor to watershed and fish resource analysis and EIS chapters. Education: B.S. Forestry; M.S. Forestry. Years of experience: 27.

Bailey Theriault – Hydrogeologist, Golder Associates Inc. Contributor to water resource analysis and EIS chapter. Education: M.S. Geosciences. Years of experience: 4.

Peter Thiede – GIS and Visualization Specialist, Golder Associates Inc. Contributor to visual resource analysis and EIS chapter. Education: Diploma (M.S. equivalent) Urban and Environmental Planning. Years of experience: 4.

Ben Vang-Johnson – GIS Analyst, Golder Associates Inc. Responsible for GIS support. Education: B.A. Biology; Professional Certificate GIS. Years of experience: 6.

Susan Wall – Staff Botanist, Herrera Environmental Consultants. Contributor to wildlife resource analysis and EIS chapter. Education: B.S. Botany. Years of experience: 18.

Alicia Ward – Environmental Scientist (Wildlife), Herrera Environmental Consultants. Contributor to wildlife resource analysis and EIS chapter. Education: B.S. Biology, M.S. Resource Conservation. Years of experience: 6.

Kara Warner, Ph.D. – Environmental Scientist, Golder Associates Inc. Contributor to environmental justice resource analysis and EIS chapter. Education: B.A. Zoology, M.S. Biology, Ph.D. Toxicology. Years of experience: 7.

Nancy Wittpenn – Environmental Protection Specialist, BPA. Environmental lead, responsible for EIS coordination and development. Education: B.S. Geology; M.S. Marine Geophysics. Years of experience: 23.

Marian Wolcott – Realty Officer, BPA. Responsible for property value analysis. Education: B.S. Forest Management. Years of experience: 36.

Josh Wozniak – Senior Scientist, Herrera Environmental Consultants. Contributor to vegetation and wildlife resource analyses and EIS chapters. Education: M.S. Genetics. Years of experience: 16.

Nicole Zehntbauer – GIS Professional, CIBER, Inc. Responsible for GIS support. Education: B.A. Geography. Years of Experience: 19.

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Chapter 31 Agencies, Organizations, and Persons Receiving this EIS

The project mailing list contains tribes; local, state, regional, and federal agencies; utilities; public officials; interest groups; businesses; special districts; libraries; colleges/universities; the media; and about 15,200 potentially interested or affected landowners. They have directly received or have been given instructions on how to receive all project information made available so far, and they have had an opportunity to review the draft and final EIS. Specific entities (other than private persons and landowners) receiving notification of the availability of this EIS are listed below by category.

31.1 Federal Agencies

US Army Corps of Engineers

USDA Forest Service

USDA Natural Resource Conservation Service

US Department of Agriculture

US Department of Energy

US Department of the Interior

USDOI Bureau of Indian Affairs

USDOI Bureau of Land Management

USDOI Fish and Wildlife Service

USDOI National Park Service

USDOC NOAA National Marine Fisheries Service

US Department of Defense

US Environmental Protection Agency

USFW Columbia River Fisheries Program Office

31.2 Tribes or Tribal Groups

Confederated Tribes and Bands of the Yakama Nation

Confederated Tribes of Chehalis

Confederated Tribes of Grande Ronde

Confederated Tribes of the Umatilla Indian Reservation

Confederated Tribes of the Warm Springs Reservation

Cowlitz Indian Tribe

Nez Perce Tribe

Quinault Indian Nation

31.3 State Agencies, Oregon

Department of Agriculture

Department of Archaeology and Historic Preservation

Department of Energy

Department of Environmental Quality

Department of Fish and Wildlife

Department of Forestry

Department of Human Services

Department of Land Conservation and Development

Department of Parks and Recreation

Department of State Lands

Department of Transportation

Governor's Natural Resources Office

Public Utilities Commission

31.4 State Agencies, Washington

Department of Agriculture
Department of Archaeology and Historic Preservation
Department of Commerce
Department of Ecology
Department of Fish and Wildlife
Department of Natural Resources
Department of Public Lands
Department of Transportation
DNR Natural Heritage Program
DNR Office of Commissioner of Public Lands
DNR Water Resources Program
Economic Development Commission
Energy Facility Site Evaluation Council
Governor's Office of Indian Affairs
Governor's Office of Regulatory Assistance
Office of Recreation and Conservation
Washington State Library, Government Publications
Washington State Parks and Recreation Commission
WDFW Renewable Energy Section
Washington Utilities and Transportation Commission

31.5 Public Officials, Oregon

US Representative Earl Blumenauer
US Representative Suzanne Bonamici
US Senator Jeff Merkley
US Representative Kurt Schrader
US Senator Ron Wyden
Governor Kate Brown
State Senator Laurie Monnes Anderson
State Representative Rob Nosse
State Senator Ginny Burdick
State Representative Barbara Smith Warner
State Senator Richard Devlin
State Senator Michael Dembrow
State Representative Lew Frederick
State Representative Ann Lininger
State Representative Mitch Greenlick
State Senator Mark Hass
State Senator Elizabeth Steiner Hayward
State Senator Betsy Johnson
State Representative Mark Johnson
State Representative Alissa Keny-Guyer
State Representative Tina Kotek
State Representative Greg Matthews
State Senator Rod Monroe
State Representative Jennifer Williamson
State Representative Tobias Read
State Senator Diane Rosenbaum
State Representative Jeff Reardon
State Senator Chip Shields
State Representative Jessica Vega Pederson
State Senator Chuck Thomsen n
State Representative Kathleen Taylor
State Representative Chris Gorsek
State Representative Brad Witt

31.6 Public Officials, Washington

US Representative Jaime Herrera Beutler
US Senator Maria Cantwell
US Senator Patty Murray
Governor Jay Inslee
State Senator Don Benton
State Representative Brian Blake
State Representative Bruce Chandler
State Senator Brian Hatfield
State Representative Paul Harris
State Senator Jim Honeyford
State Representative Jim Moeller
State Representative Ed Orcutt

State Senator Ann Rivers
State Representative Liz Pike
State Senator Annette Cleveland
State Representative Tim Probst
State Representative Dean Takko
State Representative David Taylor
State Representative Sharon Wylie

31.7 Regional Government

Metro

31.8 Local Governments, Oregon

City of Fairview
City of Portland
City of Troutdale
City of Wood Village
Multnomah County

31.9 Local Governments, Washington

City of Battle Ground
City of Camas
City of Castle Rock
City of Kalama
City of Kelso
City of La Center
City of Longview
City of Ridgefield
City of Vancouver
City of Washougal
City of Woodland
Clark County
Cowlitz County
Town of Yacolt

31.10 Businesses

Aadland, Inc.
ABC Pacific Corporation
Absolute Resources, LLC
Ace Investments, LLC
Advanced Electric, Inc.
Aho Construction I, Inc.
Aho Rental Properties, LLC
Aloha Lumber Corporation
Alpine Square, LLC
Amboy Trucking Co
American Brokers Conduit
American Eagle Mortgage
American Securities, Inc.
Amicorp Enterprises, Inc.
Andersen Dairy, Inc.
Anderson Lodge
Andersson Sverige Holdings, LLC
Ane Forests of Lewis River, Inc.
APRI, LLC
Aubol Investments, LLC
Aurora Loan Services
Avelo Mortgage, LLC
Avondale Partners, LLC
Axelhill Family Limited Partnership
B J Properties
Baker & Baker, LLC
Balta Investments, LLC
Bank of America
Bank of New York Mellon
Barnett Equity, LLC
BCI Group, Inc.
Beacon Hill Sewer District
Beneficial Mortgage
Bergeron Family Ltd Partnership

Bicoastal Longview, LLC
Big Sky Holdings, LLC
Billie McKee Logging
Birchwood Farms, LLC
Boatman Family Properties, LLC
Boespflug Development, Inc.
Border Express, LLC
Boyer Custom Homes, Inc.
Braack Motorsports, Inc.
Brookside Mobile Home Park
BTAG, LLC
Burlington Northern, Inc.
Bush Enterprises, LLC
C2H Properties, LLC
Camas Meadows Golf Club, Inc.
Camas Power Boiler, Inc.
Campbell Real Estate, LLC
Carter Investments
Cascade Coopenage
Cathy Apartments
CBI, LLC
CC Rental
CDR Solutions, LLC
CDS Servicer, LLC
CEC Fournier Estate
Cedar Falls Tree Farm
Central Northeast Neighbors Coalition Office
Chelatchie Rock, LLC
Chestnut Farms
Chilton Stuart Enterprises
Chilton, Inc.
Christison Family Farm
Cimarron Estates Mhp, LLC
Cimmaron Terrace, LLC
City Bank of Indiana
Clear Sky Properties, LLC
Clear View Merwin, LLC
Clunas Funding Group, Inc.
Cml-Wash One, LLC
Coldwell Banker Barbara Sue Seal Properties
Coletrane Investments, LLC
Columbia Pacific Construction, Inc.
Columbia Pacific Firestop
Community Education
Convenience Group, LLC
Copley Land Company Partnership
Corvel, LLC
Cougar Area Trail Seekers
Country Run Associates
Countrywide Home Loans
County Financings
County Properties East, LLC
County Properties, LLC
Covington Place Vanc, LLC
Cowlitz Animal Inn, Inc.
Cowlitz River Estates
Creation Homes, LLC
Crown Lands, Inc.
CS On Line, Inc.
CSM Ventures, LLC
CT Properties, LLC
Custom Country Homes
Darb Hill Tree Farm, LLC
Davidson Engineering, LLC
Daybreak Homes, Inc.
DBCM, LLC
DDM Properties 4, LLC
Dea Properties 8, LLC
Dearborn & Moss P, LLC
Dearey Industrial, LLC
Delta Management
Desunk, LLC
Detemple Farm, LLC
Deutsche Bank National Bank Company
Dew, Inc.
Diverse Funding Northwest, LLC
DKM Investments, LLC
Doerr Property New Valley, LLC
Don Marquardt Properties, LLC D

Dragon Analytical Laboratory, Inc.
DS Properties, LLC
Duch Properties, LLC
Eastfork Adventures, Inc.
Edmunds Estates, LLC
Edwards Tree Farm, LLC
Elite Renovators, LLC
Ellinwood Associates
Elliot Consultants
EMC Mortgage
Encore Development Properties, LLC
Endeavor Properties, LLC
Endpoint Services
Energy Central
Energy Expert Services, Inc.
Erickson Enterprises, LLC
Essex Real Estate Investments, LLC
Fab Facility, LLC
Fairview Holdings, LLC & Raze James G
Family Tree Farms, LLC
Fatpup, LLC
Fazzolari & Associate TPH, LLC
Federal Home Loan Mortgage Corp
FedEx Ground Package
Fibre Federal Credit Union
Fibrex & Shipping Company
Fielding Farms
Fiesta Properties, LLC
First Healthcare Corporation
First Independent Bank
Fitzgeralds General Contracting
Flex Properties-Cold Creek, LLC
Fort James Operating Company, Inc.
Fourth Plain Properties, LLC
FPM Properties, LLC
Francar, LLC
Friberg Properties, LLC
Front Nine Management, LLC
G&B Property Group, Inc.
GD3, LLC
Gecho Construction, Inc.
Genteel Investments, LLC
Girod Family Investments, LLC
Glen Park Properties, LLC
GM Camas, LLC
GM Construction
GMAC Mortgage, LLC
GM-Prairie, LLC
Godfrey Auto Works
Golden West Mobile Manor
Goodwill Industries
Goodyear Farms, LLC
Gordanier Iris Estate
Gordy Jolma Construction
Granite Highlands, LLC
Greenway Crossing
H&R Futures, LLC
Haley Vivian Estate
Hambleton Bros Lumber Company
Hamm Frances Estate
Hang Fung Enterprises, LLC
Harder Michael K Estate
Harmony Investments, LP
Haslinger Properties, LLC
Heaton Gulch, LLC
Heirborne Investments II, LLC
Hickey Family Company
High Synergy Properties, LLC
Hinton Orchards, LLC
Holbrook & McGraw
Holbrook, Inc.
Holiday Inn Express
Holten-Andersen Per Company
Holy Water Estates, LLC
Home Pro, LLC
Horne Family Tree Farm, LLC
HQ WA, LLC
HSBC Bank USA National Association
HSBC Mortgage Services, Inc.
HUD
Huntley Family Ltd Partnership
ICF International

Inland Empire Residential Resources
Innovative Housing Solutions, LLC
Integral Consulting, Inc.
Invenergy
J R Merit Investments, LLC
Jaman, LLC
James River II, Inc.
JDR Property Investments, LLC
Jeff Whittaker Ira, LLC
Jefferies Property Investments, LLC
JMS Properties, LLC
Joel A Feldman Profit Sharing Plan
Johnston Dairy, LLC
Joslen Rentals, LLC
Joy James Donald Estate
JSR Investments, LLC
Karlsen Development, LLC
Keller Williams Realty
Kesler Smith, Inc.
Keys & Davis Holdings, LLC
Kimbal Logan Real Estate
Kingsleywood, LLC
KMD Investments, LLC
Kowser Investments, LLC
KPK Properties, LLC
Kramerica Industries, LLC
Kravas Properties
KRG, Inc.
Kubiniec, LLC
Kunze Family Forest, LLC
Kunze Farms, Inc.
Kwik Center, LLC
L&W Holding Ltd
La Pianta Ltd Partnership
Lake Merwin Campers Hideaway
Lake Merwin Development Company
Larry Boitano Builder Ltd
Lasalle Bank National Association
Lawrence Kujava Life Estate
Learning Academy
Lef Gray, LLC
Lelooska Foundation
Level 3 Communications, LLC
Leyda Consulting, Inc.
Lone Fir Bar & Grill, LLC
Longcreek Company, LLC
Longview Fibre
Longview Timberlands, LLC
Lookout Ridge Townhomes, LLC
Lookout Ridge, LLC
Lower Columbia Longshoreman's Federal Credit Union
LSPI Exchange Corporation
LTC Properties, Inc.
Lucas Developments, LLC
Luktanat, LLC
LWS, LLC
Lysons Park, Inc.
M C Marine, LLC
M&H Washington Properties, LLC
M2J Investment Group, LLC
MacGregor Land Company
Mammenga 59th Street, LLC
Manzanita Enterprises, LLC
Marimar Estates
Mason Bruce & Girard
MBRK, LLC
McGowan Properties
MCI Telecommunications Corporation
McKeehan Construction, Inc.
MDN DEVCO, LLC
Meadow Wood Associates I, LLP
Metro Landscape Supplies
Miller Nash, LLP
Mills Family, LLC
Milwaukie Lumber Company
Minnehaha Business Plaza, Inc.
Minnehaha Corporation Center I, LLC
Mint Lake Farms, LLC
Morse Bros, Inc.
MSHE, Inc.
National City Bank

Neighbors West Northwest Coalition Office
Niemi Ocea R Estate
North Pacific Property Services
Northwest Energy Coalition
Northwest Pipeline Corporation
Note Buyers, LLC
Nutter Corporation
Nylund Homes, Inc.
Odin, LLC
Old Trolley Square, LLC
Onset Enterprise, LLC
Oregon Farm Bureau Federation
Ostrander Construction Co
P&E Investments, LLC
P&R Technologies
Pacific Links, LLC
Pacific Powerline, Inc.
Pacific Rock Products, LLC
Palms 24, LLC
Parkside Commerce Center Lp
Parson Holdings, LLC
Part IV Properties, LLC
Part V Properties, LLC
Picture Perfect Properties, LLC
Pier V Management, LLC
Pine Mountain Excavating
PLG Fund I, LLC
Plum Creek Land Company
Pomeroy Plowman Ranch Ltd
Poor Farm, LLC
Port of Camas-Washougal
Port of Longview
Port of Portland
Port of Ridgefield
Port of Vancouver
Port of Woodland
Power Engineers
Prak Commercial
Premier Realty
Provident Financial
Prudential Northwest Properties
Quail Investments Three
R H Emmerson & Son, LLC
Rashford Tree Farm & Investments Company
Red Canoe Credit Union
Regional Services, Inc.
Reitsch Weston & Blondin
Remax Equity Group Realtors
Renaissance Custom Homes, LLC
Revesz & Company
Ridgecrest Development III, LLC
Riverview Apartments
Riverview Asset Management & Trust Company
Riverview Community Bank
Riverwatch, LLC
Robinwood Properties, Inc.
Roth Investments, LLC
Rotschy, Inc.
Royal Estates Ltd D
Royal Ridges Retreat
RSG Forest Products, Inc.
Ruestig Farms, LLC
Ruth Fam Limited Partnership
S Kem Design & Construction Company Tract B
Salal Flat, Inc.
Sanpe, Inc.
Schwabe, Williamson & Wyatt
Segale Properties, LLC
Seong Kong, Inc.
Sharp Microelectronics
Shelmas Company Profit
Sherwood Court Income Properties, LLC
Sierra Pacific Industries
Sifton Industrial, LLC
Sirrah Corporation
Sixbur Corporation
Sky Teaz Water Systems, LLC
Slosar Properties, Inc.
Sound Built Rentals

Southeast Uplift Neighborhood Services
Southwest Neighborhoods, Inc.
Specialty Minerals, Inc.
Springbrook Estates
Stanco Financial Corp
Statewide Storage Partners Elk Grove
Stonehedge, LLC
Stout Rentals, LLC
Strom Family Ltd Partnership
Structured Asset Securities Corp
Svedje Corp
System Construction Company
T28, LLC
Tapco, LLC
Taylormade Homes
The Management Group
Thomas Foley & Associates
Three Angels Broadcasting Trustee
Tidland Corporation
To Every Season Antiques
Tom Griffith Construction, Inc.
Tom Moyer Theatres
TPHH Partnership
Trailwood Farms
Transalta Centralia Generation
Transcelt, LLC
Trio Investment Partners, Inc.
Trout Lakes Joint Venture
Tukes Valley
Twin City Investment, LLC
Uhacz Family Farm Partnership
US, LLC
Vancouver Clinic Building, LLC
Vancouver Oil Company
Vanport Manufacturing, Inc.
VE&E Nevada, LLC
Velda Nelson, LLC
View Point Construction, Inc.
VLW Real Estate, LLC
Voiture 99
Wallace Estates, LLC
Walt Musa, Inc.
Walz Family Ltd Partnership
Warren Ltd Partnership II
Washington Federal Savings
Washington Mutual Bank
Washougal Investors II, LLC
Waterman Mitigation Partners
Watermark Estates, Inc.
Watkins Tractor & Supply Company
Wells Fargo Bank
West Coast Bank
Western Properties I, LLC
Western United Life Insurance Company
Weyerhaeuser Company
Wildlife Services Company, Inc.
WIP, LLC
Wollam I, Inc.
Woodland Management, Inc.
Woodymacd, LLC
Yacolt Investments
Zoya Properties, Inc.

31.11 Utilities

City of Centralia Public Works, Centralia City Light
Clark Public Utilities
Clark Public Utilities District No. 1
Clatskanie Public Utilities District
Columbia River Public Utilities District
ColumbiaGrid
Cowlitz County Public Utilities District
Forest Grove Light and Power
Grays Harbor Public Utility District
Iberdrola Renewables, Inc.
Inland Power and Light
Lewis County Public Utilities District No. 1
McMinnville Water and Light
Northern Wasco County People's Utility District

Pacific County Public Utilities District No. 2

PacifiCorp

Portland General Electric Company

Puget Sound Energy, Inc.

Salem Electric Company

Seattle City Light

Wahkiakum County Public Utilities District No. 1

West Oregon Electric Cooperative, Inc.

31.12 Interest Groups

31.12.1 Neighborhood Associations

Andresen St. John Neighborhood Association

Benton Street Neighborhood Association

Central Northeast Neighbors Coalition Office

Columbia Shores Neighborhood Association

Concerned Citizens of Hockinson Neighborhood

Creekside Acres Homeowners Association Daybreak Neighborhood Association

East Fork Frontier Neighborhood Association

East Fork Hills Rural Association

East Minnehaha Neighborhood Association

East Portland Neighborhood Coalition Office

Enterprise Paradise Point Neighborhood Association

Evergreen Terrace Neighborhood Association

Fairgrounds Neighborhood Association

Felida Neighborhood Association

Fern Prairie Neighborhood Association

Forest Hills Neighborhood Association

Forest Home Neighborhood

Goot Park One Stop Neighborhood Association

Greater Brush Prairie Neighborhood Association

Green Meadows Neighborhood Association

Heritage Neighborhood Association

Hillside Terrace Neighborhood Association

Holly Hills Neighborhood Association

Lacamas Shores Neighborhood Association

Lacamas View Neighborhood Association

Lake Pointe Neighborhood Association

Lincoln Neighborhood Association

Maple Tree Neighborhood Association

Meadow Glade Neighborhood Association

Mountain View Neighborhood Association

Neighborhood Associations of Clark County

Neighbors West Northwest Coalition Office

North Fork Lewis Neighborhood Association

North Portland Neighborhood Services, Coalition Office

North Salmon Creek Neighborhood Association

Northeast Coalition of Neighborhoods

Northeast Hazel Dell Neighborhood Association

Pleasant Highlands Neighborhood Association

Proebstel Neighborhood Association

Ridgefield Junction Neighborhood Association

Roads End Neighborhood Association

Sherwood Hills Neighborhood Association

Shumway Neighborhood Association

Sifton Neighborhood Association

South Salmon Creek Neighborhood Association

Southeast Uplift Neighborhood Services, Coalition Office

Southwest Neighborhoods, Inc., Coalition Office

Sunnyside Neighborhood Association

Tidland Heights Neighborhood Association

Truman Neighborhood Association
Washougal River Neighborhood Association
West Hazel Dell Neighborhood Association
Wooded Ridge Neighborhood Association

31.12.2 Homeowners Associations

Alderspur Road Association
Applewood Hills Homeowners Association
Balsom Estates
Black Hawk Estates
Camas Rivers Edge Homeowners Association
Columbia Summit Estates Homeowners Association
Crown Park Homeowners Association
Deer Creek Homeowners Association
Forest Hills Homeowners Association
High Meadow Homeowners Association
Highvalley Homeowners Association
Hillshire Homeowners Association
Ivy Glen Homeowners Association
Kaskillah Road Association
Kaskillah Subdivision
Knight's Pointe Homeowners Association
Lacamas Creek Communities
Lacamas Northshore Development
Lacamas Summit Homeowners Association
Lacamas View Homeowners Association
Lacamas Woods Homeowners Association
Lake Heights Homeowners Association
Lake Pointe Homeowners Association
LakeRidge Homeowners Association
Lakespur Homeowners Association
Lookout Ridge Homeowners Association
MeadowRidge Homeowners Association
Meadows North Homeowners Association
Oak Park Homeowners Association
Oak Ridge Estates Homeowners Association
Oregon Apollo Alliance
Parker Estates Homeowners Association
Peerywood Homeowners Association
Prune Hill Park Homeowners Association
Prune Hill Summit Homeowners Association
Renaissance Summit Homeowners Association
Ridge Homeowners Association
Shelborne Homeowners Association
Shiloh Heights Homeowners Association
Skyview Homeowners Association
Stoddard Road Association
Stoney Meadows Homeowners Association
Summer Hills Homeowners Association
Summit Hills Homeowners Association
Summit Oaks Homeowners Association
Thomas Estates Homeowners Association
Triple Creek Homeowners Association
View Ridge Estates Homeowners Association
Vineyards Homeowners Association
Waterleaf Homeowners Association, Management Group
Willow Creek Homeowners Association
Winchester Hills Homeowners Association
Wooded Ridge Homeowners Association

31.12.3 Environmental and Outdoor Recreation

1000 Friends of Oregon
40-Mile Loop Land Trust
Audubon Society of Portland
Audubon Washington
Blue Mountain Audubon Society
Bonneville Conservation Restoration and Renewal Team
Cascade Land Conservancy
Columbia Land Trust
Columbia Riverkeeper
Cougar Area Trail Seekers

Environment Oregon
Fish First
Freshwater Trust
Friends of the Columbia Gorge
Friends of the Cowlitz
Friends of the East Fork Lewis River
Friends of the Ridgefield National Wildlife Refuge
Future Wise
Gifford Pinchot Task Force
Lower Columbia River Estuary Partnership
Mazamas
Nature Conservancy Oregon, Main Office
Nature Conservancy Washington, Washington Field Office
Northwest Energy Coalition
Oregon Environmental Council
Oregon League of Conservation Voters
Oregon Natural Desert Association
Oregon Wild
Pacific Environmental Advocacy Center, Northwest Environmental Defense Center
Pistons Wild Outdoor Recreational Vehicle Club
Save Our Scenic Area
Sierra Club, Oregon Chapter
The Mountaineers
Vancouver Audubon Society
Washington Environmental Council
Washington Trails Association
Washington Wildlife Federation
Western Environmental Law Center
Willapa Hills Audubon Society

31.12.4 Community

A Better Way for BPA
Another Way BPA
Citizens Against the Towers
Clark County Citizens United, Inc.
Cowlitz Pomona Grange #7
Lelooska Foundation
Yale Valley Coalition

31.12.5 Schools

Battle Ground Public Schools
Camas School District
Castle Rock School District
Chehalis School District
Evergreen School District
Green Mountain School District
Gresham-Barlow School District
Hillsboro School District
Hockinson School District
Kelso School District
La Center School District
Longview School District
Reynolds School District
Ridgefield School District
Vancouver School District
Washougal School District
Woodland School District

31.12.6 Governmental Councils and Committees

Affiliated Tribe of Northwest Indians
Clark Regional Wastewater District
Columbia River Economic Development Council
Cowlitz Conservation District
Cowlitz County, Economic Development Council
Cowlitz County Cemetery District 3
Cowlitz-Wahkiakum Council of Governments

East Multnomah Soil and Water Conservation District

Interagency Committee for Outdoor Recreation

Lexington Flood Control District

Longview Parks & Recreation Department

Office of Oregon State Trust for Public Lands

Oregon Association of Conservation Districts

Trust for Public Lands, Northwest Regional Office

Trust for Public Lands, Oregon Field Office

Washington Association of Conservation Districts, Southwest Area

Washington Association of Sewer & Water District

West Multnomah Soil and Water Conservation District

31.12.7 Business and Industry

AFL-CIO Oregon

AFL-CIO Washington State Labor Council

Cascadia Center

Columbia Meadows

International Brotherhood of Electrical Workers, Local 46

International Brotherhood of Electrical Workers, Local 48

Oregon Farm Bureau Federation

Oregon Forest Industries Council

Oregon Rural Action

Oregon Small Woodlands Association

Pacific Northwest Economic Region

Thomas Foley & Associates, Renewable Northwest Project

Washington Apollo Alliance

Washington Association of Wheat Growers

Washington Farm Bureau

Washington Farm Forestry Association

Washington Association of Wheat Growers

31.13 Media

31.13.1 Newspapers

Camas-Washougal Post Record

Mount St. Helens Valley Bugler

The Columbian

The Daily News

The Gresham Outlook Online

The Oregonian

The Reflector

31.13.2 Television

KATU

KGW

KLTV

KOIN

KOPB

KPAM

KPTV

31.13.3 Radio Stations

KEX

KOPB

KXL

31.14 Libraries

31.14.1 University Repository Libraries

Lewis and Clark College (Paul L. Boley Law Library)

Linfield College

Oregon State University

Pacific University Library

Portland State University (Branford P. Millar Library)

University of Washington

Western Oregon University

31.14.2 Public Libraries

Battle Ground Community Library

Camas Public Library

Castle Rock Public Library

La Center Community Library

Longview Public Library

Multnomah County Central Library

Troutdale Library

Vancouver Cascade Park Library

Vancouver Community Main Library

Yacolt Library Express

Yacolt Town Hall

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Chapter 32 Glossary and Acronyms

32.1 Glossary

access roads – Roads constructed to each tower site first to build the tower and line, and later to maintain and repair it.

agriculture – Land cover category used in the land analysis of this EIS. The agriculture category represents large tracts of herbaceous vegetation or plowed areas associated with agricultural activities. These include pasture, crops, and orchards. These areas often coincide with the rural land cover type, but were digitized separately when it was appropriate to isolate building clusters/compounds as discreet polygons during the digitizing process.

albedo – Solar reflectivity of the earth's surface.

alluvial fan deposits – Sediment deposited in alluvial fans; alluvial fans are a low, outspread, relatively flat to gently sloping mass of loose rock material deposited by streams at the place where the stream issues from a narrow valley upon a plain or broad valley.

alluvium – A general term for clay, silt, sand, and gravel deposited by a stream or other body of running water.

ambient – Surrounding natural conditions or environment of a given place at a given time.

amperes (A) – A unit of measurement of electric current produced in a circuit by 1 volt acting through a resistance of 1 ohm, which is the rate electrons flow in a wire.

anadromous fish – Fish that hatch and rear in fresh water, migrate to the ocean (salt water) to grow and mature, and migrate back to fresh water to spawn and reproduce.

anthropogenic – Caused or produced by humans.

aquatic bed – Vegetation community with submerged and floating-leaved aquatic plants.

archaeological resources – Any material remains of human life or activities that are at least 100 years of age, and are of archaeological interest.

archaeology – The scientific study of material remains (artifacts, e.g., stone tools, fish hooks) of past human life and activities.

area of potential effect (APE) – The area that may be affected by the proposed project, including direct and indirect impacts.

attenuation – Reduction of the size, strength, or density of something, such as a signal or noise source.

bedrock – A general term for the rock, usually solid, that underlies soil or other unconsolidated, superficial material.

Best Management Practices (BMPs) – Practices or combination of practices that are employed to ensure development is conducted in an environmentally responsible manner, protecting sensitive receptors such as wildlife, air quality and landscapes.

blackout – The disconnection of the source of electricity from all electrical loads (users) in a certain geographical area.

blasting – The controlled use of explosives to excavate or remove rock.

brownout – A partial reduction of electrical voltages that causes lights to dim and motor-driven devices to lose efficiency.

candidate species – Federal or Washington State listing status of a plant or wildlife species. under the ESA as determined by the USFWS. Candidate species are those species (or subspecies, variety, or evolutionarily significant units of a species) for which the USFWS has sufficient information on their biological status and threats to propose them as endangered or threatened under the ESA. Candidate species receive no statutory protection under the ESA. However, the USFWS encourages cooperative conservation efforts for these species to prevent further decline and possibly eliminate the need for listing in the future.

capital – The stock of resources used to produce other goods and services now and in the future. Natural capital refers to the stock of natural resources—e.g., water, air, soil—that yield a flow of ecosystem goods and services. Social capital refers to the stock of human relationships, shared norms and values, and other connections that yield benefits through social cohesion and cooperation.

capacity – The maximum load that a generator, piece of equipment, substation, transmission line, or system can carry under existing service conditions.

channel avulsions – The rapid abandonment of a river channel and the formation of a new river channel. Avulsions occur from channel slopes that are much lower than the slope that the river could travel if it took a new course.

Class A weeds – Non-native noxious weeds whose distribution is still limited in Washington State, as designated by the WSNWCB. Eradication of all Class A plants is required by law; eradicating existing infestations and preventing new infestations are the highest priorities.

Class B weeds – Non-native noxious weeds whose distribution is limited to portions of Washington State, as designated by the WSNWCB. Species are designated for control in state regions where they are not yet widespread; in these areas prevention of new infestations is the primary goal. In regions where a Class B species is already abundant, control is decided at the local level and containment is the goal.

Class C weeds – Non-native noxious weed species that are either already widespread in Washington or are of special interest to the agricultural industry, as designated by the WSNWCB. Class C status allows a county to enforce control if it is beneficial to that county; other counties may choose to provide education or technical support for the removal or control of these weeds.

Clean Water Act (CWA) – A federal law intended to protect water quality and to maintain the physical and biological integrity of the nation's waters.

CO_2e – CO_2e is a unit of measure used by the Intergovernmental Panel on Climate Change that takes into account the global warming potential of each of the emitted GHGs using global warming potential factors.

community park – A community park is a minimum of 10 to 25 acres in size, serves the broad community, and includes facilities for active and passive recreation.

compaction (soils) – Compression of soil pores from rolling, tamping, or use of heavy equipment on soil. Soils become hardened, difficult to cultivate, and impermeable to air and water.

concrete shaft footings – Used at river crossings or in areas where the tower must sustain a higher load and requires additional support. Concrete shaft footings can be built on solid bedrock or in soils unfavorable for grillage footings. Concrete shaft footings are engineered columns of concrete reinforced by steel rods about 4 to 10 feet in diameter. Footing depth depends on site-specific engineering requirements.

conditional firm transmission service – Long-term transmission service that BPA may be able to provide when there is not enough firm transmission service, but conditional firm service has constraints that give BPA additional curtailment rights when granting the service. This service has a lower priority than firm service, but is a higher priority than non-firm service.

conductors – The wires that carry the electrical current on the transmission line.

contrast rating – A systematic process used to determine the degree of visual contrast created between the proposed projects and activity and the existing landscape.

control house – The substation building that contains electrical panels, meters, relays and other equipment needed to control the transmission line operation.

corona – Corona occurs in regions of high electric field strength on conductors, insulators, and hardware when sufficient energy is imparted to charged particles to cause ionization (molecular breakdown) of the air.

counterpoise – A buried wire system connected to the footings of towers or poles supporting a transmission line. Used to establish a low-resistance path to earth, usually for lightning protection.

Critical Aquifer Recharge Area (CARA) – Area designated by the Washington Administrative Code that is determined to have a critical recharging effect on aquifers used for potable water (as defined by WAC 365-190-030[2]).

Critical Habitat – An area or areas designated by USFWS as essential for the conservation of a federally listed species.

cultural resources – Nonrenewable resources associated with human occupation or activity related to history, architecture, archaeology, engineering, and culture.

cumulative impacts – Impacts created by the incremental effect of an action when added to other past, present, and reasonably foreseeable future actions.

current – The flow of electric charge through a wire.

culvert – A corrugated metal or concrete pipe used to carry or divert runoff water from a drainage; usually installed under roads to prevent washouts or erosion.

cut-and-fill – Process of constructing road or canal whereby the amount of materials from cuts roughly matches the amount of fill needed to make nearby embankments.

danger tree – A tree that occurs adjacent to the cleared right-of-way and is hazardous to the transmission line. These trees are removed to prevent any such tree from falling on to or otherwise interfering with a conductor. A tree would be identified as a danger tree if it could fall into, bend into, or grow into the conductor or close enough to cause a "flashover" of current from the conductor. Further, a swing-into danger tree is one that is likely to experience contact or "flashover" from the swing displacement of the conductor. See Transmission Line Maintenance Standards and Guides Section VII.B.1.

dead-end towers – Heavy towers designed for use where the transmission line loads the tower primarily in tension (pull) rather than compression (downward push), such as in turning large angles along a line or bringing a line into a substation.

debris flow – Rapid movement of water-charged mixtures of soil, rock, and organic debris down steep stream channels.

decibel (dB) – A unit of sound measurement. In general, a sound doubles in perceived loudness for every increase of 10 decibels.

decrease – Where bolded in Chapter 11, Socioeconomics this term reflects decreases in the amount or value of a resource, as defined in Section 11.2.1.

demand side management – The strategies that focus on influencing when and how customers use electricity, with an emphasis on reducing or leveling load peaks, such as conservation measures and rate incentives for shifting peak loads, and energy storage schemes for reducing, redistributing, shifting, or shaping electrical loads.

distinct population units – the smallest division of a taxonomic species permitted to be protected under the U.S. Endangered Species Act.

distributed generation – Placing small amounts of generation located on a distribution system for the purpose of meeting local peak loads, and/or displacing the need to build/upgrade larger-scale, centralized generation facilities.

dewatering – To divert or remove water from an excavated area, stream or river channel to construct or rebuild dams and related hydroelectric facilities.

digitize – The process in GIS by which aerial photographs (and other geospatial data) are used as references to “draw” polygons encompassing features of interest (or vegetation types in the case of this study), to characterize different geographic areas in a visual way so that they can be easily classified on a map.

double-circuit – Two separate electrical circuits (for alternating current, each circuit consists of three separate conductors or bundles of conductors) on the same transmission towers.

drain dip – A wide, shallow depression placed in a road surface to divert water off the road into a stable drainage to prevent erosion.

electric and magnetic fields (EMF) – The two kinds of fields (electric and magnetic) produced around the electric wire or conductor when an electric transmission line or any electric wiring is in operation.

emergent – Vegetation that is rooted below water but grows above the surface.

emigration – In fish, emigration is movement out of natal (i.e., birth place) and or rearing areas toward the ocean.

encroachment – Land use along a powerline right-of-way that may not be compatible or allowed within the existing right-of-way, depending on existing easements and land use agreements. Examples of encroachments are tall-growing landscaped vegetation; unauthorized recreation; storage of RVs, cars and boats; buildings such as garages or sheds; and fences through tower legs.

endangered species – A federal or state listing of a plant or wildlife species. Under federal listing (as determined by the USFWS under the ESA), these species (or subspecies, variety, or evolutionarily significant units of a species) are determined to be in danger of extinction through all or a significant portion of their range. The ESA protects endangered species and their habitats by prohibiting "take" (harassment, disturbance, removal, hunting, etc.) of listed animals or plants, except under Federal permit. The ESA also regulates the designation of "critical habitat" for listed species, which may include areas not currently occupied by the species but essential to its conservation. Under state listing (by the WDFW), these species are defined as a species native to the state that is seriously threatened with extinction throughout all or a significant portion of its range throughout the state.

ephemeral stream – A stream that only exists for a short period of time during or following precipitation or snowmelt. EPA also defines ephemeral streams as having channels that are above the groundwater reservoir at all times (see intermittent stream).

estuarine – Related to the wide lower course of a river where it flows into the sea. Estuaries experience tidal flows and their water is a changing mixture of fresh and salt.

ethnography (ethnographic, adj.) – The branch of anthropology that deals with the scientific description of specific human cultures.

evapotranspiration – The transport of water into the atmosphere from surfaces, including soil (soil evaporation), and from vegetation (transpiration). Other contributors to evapotranspiration may include evaporation from wet canopy surface (wet-canopy evaporation), and evaporation from vegetation-covered water surface in wetlands.

evolutionarily significant unit – Population of a species that is considered distinct for purposes of conservation. Delineating ESUs is important when considering conservation actions.

experiential – Relating to, derived from, or providing experience.

Farmland of Statewide Importance – Land, in addition to prime farmlands, that is of statewide importance for the production of food, feed, fiber, forage, and oil seed crops. Unlike prime farmland, criteria for defining and delineating this land are determined by the appropriate state agency or agencies. Farmland of statewide importance typically includes land that is nearly prime farmland and could economically produce high yields of crops.

fault – A discrete surface or zone of discrete surfaces separating two rock masses across which one mass has slid past the other.

federally listed – Species listed as threatened or endangered by the USFWS.

fiber optic cable – Special wire installed on the transmission line that is used for communication between one location and another. Fiber optic technology uses light pulses instead of radio or electrical signals to transmit messages.

firm transmission service – Transmission service that is reserved or scheduled for a specific term (usually a year or longer) that is of the same priority as that of BPA's use of the transmission system.

fish window – A period of calendar time suggested by state or federal fisheries agencies where in-water construction work is preferred; and where such work is prohibited before or after such period.

fish-bearing stream – Streams that are known to be used by fish, or meet the physical criteria to be potentially used by fish. Fish streams may or may not have flowing water all year; they may be perennial or seasonal.

flashover – A disruptive discharge through the air around or over the surface of an insulator produced by the application of a voltage of sufficient magnitude to cause the breakdown path to become ionized and result in an electric arc or fault. A flashover can be caused by lightning surges on a transmission line.

floodplain hydraulic roughness – The presence of anything in the floodplain that could slow the flow of water through the floodplain. A mowed pasture would be low in hydraulic roughness compared to a forested floodplain. Tall grass would provide more roughness than mowed grass or sparse vegetation.

floodplains – Areas adjacent to rivers and streams that might be flooded during high water; those that have a 1 percent chance of being flooded in a given year are 100-year floodplains.

footings – An assembly of metal in the ground at each of the four tower corners.

forb – A broadleaf non-woody plant that is not a grass, sedge, or rush.

foreground and middle-ground view – The area visible from a travel route, use area, or other observation point to a distance of 3 to 5 miles. The outer boundary of this zone is

defined as the point where the texture and form of individual plants are no longer apparent in the landscape.

freshet – A sudden rise or overflow of a stream resulting from a heavy rain or melting snow.

fry – In trout and salmon, this is an early life history stage, after fertilized eggs hatch and deplete their yolk-sac, when juveniles emerge from their redd to actively search for food.

fugitive dust – Any solid particulate matter that becomes airborne, other than that emitted from an exhaust stack, directly or indirectly as a result of the activities of people.

functions and values – The special benefits provided by wetlands that are considered valuable to society and to the environment, and are the result of the inherent and unique natural characteristics of wetlands, such as protecting and improving water quality and providing habitat for fish and wildlife.

gauss – A unit of magnetic induction.

generation redispatch – Management of generation patterns to overcome cut plane or outage problems.

genetic reserve – Conservation area intended to maintain and protect the genetic diversity and integrity of a target species.

glacial till – Till or glacial till is unsorted glacial sediment. Glacial drift is a general term for the coarsely graded and extremely heterogeneous sediments of glacial origin. Glacial till is that part of glacial drift which was deposited directly by the glacier.

grillage footings – Used for dead-end towers. They consist of a 15-foot by 15-foot assembly of steel I-beams that have been welded together and buried 14 to 16 feet deep for each tower foot.

ground wire – A protective wire strung above the conductors on a transmission line to shield the conductors from lightning; also called shield wire or overhead ground wire.

guard structure – Structure similar to an 115-kV H-frame wood structure usually installed within the right-of-way on either side of the road, highway, water, etc. during construction to protect an area during construction stringing. These structures are removed once conductor stringing is complete.

habitat fragmentation – A process by which human development divides a habitat into smaller areas, hindering the spread or movement of plants and animals from one area to another and increasing the vulnerability of the habitat to disturbance.

hazardous substance – Hazardous substances are substances that are considered severely harmful to human health and the environment and include hazardous substances as defined in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

hazardous waste – Hazardous waste is defined under the Resource Conservation and Recovery Act (RCRA) as a solid waste (or combination of solid wastes) that, because of its

quantity, concentration, or physical, chemical, or infectious characteristics, may do the following: (1) cause or contribute to an increase in mortality or an increase in serious irreversible, or incapacitating illness, or (2) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

herbaceous balds – Patchy grass and forb areas located on shallow soils over bedrock often on steep slopes that are commonly fringed by forest or woodland. Dominant flora includes herbaceous vegetation, dwarf shrubs, mosses, and lichens.

high impact – This rating represents conditions unique to each resource. It is defined in each chapter's section on impact levels.

historic properties – Are a subset of cultural resources that are eligible for inclusion in the National Register of Historic Places.

historic resources – Are defined as extant buildings, structures and objects that are at least 50 years old.

historic-period sites – Sites from after the arrival of Europeans.

Holocene – The epoch between about 10,000 years ago and the present.

hydric soil – Soil that is saturated, flooded, or inundated long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic (water loving) vegetation.

hydrogeomorphic – A wetland classification indentifying wetlands according to their position within the landscape (e.g., slope, riverine) and the functions they perform as a result of that landscape position.

hydrology – The science of the properties, distribution, and circulation of water.

Hydrologically immature – In forest, areas with less than 10 percent total crown closure and/or more than 75 percent of the tree crown in hardwoods. Non-forested areas are also considered hydrologically immature.

hydrophytic (vegetation) – Describes plants that have adapted to living in aquatic environments. These plants require special adaptations for living submerged in water, or at the water's surface.

hydrology – Hydrology addresses properties, distribution, and circulation of water.

igneous – Rocks or minerals that solidified from molten or partly material (i.e., magma).

increase – Where bolded in Chapter 11, Socioeconomics this term reflects increases in the amount or value of a resource, as defined in Section 11.2.1.

intermittent stream – A stream where portions flow continuously only at certain types of year, for example when receiving water from a spring, groundwater source, or surface-water

source such as melting snow. At low flow there may be dry segments alternating with flowing segments.

jumper – A short length of conductor connecting two points in a circuit usually at a tower.

juvenile – A young fish that has not reached sexual maturity.

kilovolt – One thousand volts (see Volt).

lahar – A mudflow composed chiefly of volcanic materials including mud, rocks, and water, on the flanks of a volcano.

larvae – An early life history stage of some fish during which they grow for a certain period of time before metamorphosing into adults.

liquefaction – The transformation of a solid soil to a liquid state, typically as the result of earthquake shaking.

List A – Designation by the ODA for noxious weeds recommended for eradication or intensive control when and where found.

List B – Designation by the ODA for noxious weeds recommended for intensive control on a site-specific, case-by-case basis at the state, county, or regional levels.

List T – Designation by the ODA for noxious weeds recognized as priority species for prevention and control.

lithic – Made of stone.

lithospheric plate – A segment of the Earth's crust (lithosphere), which adjoins other plates along zones of seismic activity.

litterfall – The transport of leaves, bark, twigs, and other forms of dead organic material and constituent nutrients from trees, shrubs, and other plants to the top layer of soil or to bodies of water.

load – The amount of electric power or energy delivered or required at any specified point or points on a system. Load originates primarily at the energy-consuming equipment of customers.

load curtailment – A temporary reduction in electric power delivery under emergency conditions, taken after all possible load management measures have been tried.

long-range view – The area visible from a travel route, use area, or other observation point to a distance of greater than 5 miles. Also called the background distance zone.

low impact – This rating represents conditions unique to each resource. It is defined in each chapter's section on impact levels.

low-income population – Groups of people identified using the annual statistical poverty thresholds from the Bureau of the Census' Current Population Reports, Series P-60 on

Income and Poverty. In identifying low-income populations, agencies may consider as a community either a group of individuals living close to one another, or a set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions of environmental exposure or effect (CEQ 1997).

maintenance area – Geographic area that has a history of non-attainment, but now consistently meets the National Ambient Air Quality Standard (NAAQS). See attainment.

mass wasting – The downward movement of rock debris.

megawatt (MW) – One million watts, or one thousand kilowatts; an electrical unit of power.

mesic (vegetation) – Type of habitat with a moderate or well-balanced supply of moisture.

microclimate – A local atmospheric zone where the climate differs from the surrounding area (for example, south-facing slopes or areas adjacent to water bodies).

micropiles – Steel rods used to strengthen and stabilize the foundation of a building or structure.

middle-ground view – See foreground and middle-ground view.

Milligauss (mG) – A unit used to measure magnetic field strength; one-thousandth of a gauss.

mine tailings – The materials (e.g., ground rock) left over after the desired minerals have been removed.

mini park – A mini park is generally 0.25 acre in size, in close proximity to a neighborhood, and serves people within the immediate neighborhood (Cowlitz County 2010b).

Minimum Vegetation Clearance Distance – Minimum distance measured from vegetation to a conductor at maximum line sag and swing, for a prescribed kV rating, line temperature, ice load and wind force. Minimum distance is established to ensure a safe clearance from transmission facilities to vegetation.

minority – Individual(s) who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic (CEQ 1997).

minority population – Minority populations should be identified where either (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. In identifying minority communities, agencies may consider as a community either a group of individuals living close to one another, or a dispersed/transient set of individuals (such as migrant workers or Native American), where either type of group experiences common conditions of environmental exposure or effect. A minority population also exists if there is more than one minority group present and the minority percentage, as calculated by aggregating all minority persons, meets one of the above-stated thresholds (CEQ 1997).

moderate impact – This rating represents conditions unique to each resource. It is defined in each chapter's section on impact levels.

motorized trail – A recreation trail that is open to some or all of the following uses: four-wheel drive vehicles, all-terrain vehicles, and motorcycles. These trails are often open to non-motorized uses as well.

multi-component sites – Where both pre-contact and historic-period cultural materials are present.

myth-time stories – These are stories that detail creation beliefs for the tribes and therefore hold religious significance.

neighborhood park – A neighborhood park is a minimum of 5 acres in size and primarily serves residents within one-half mile of the park (Cowlitz County 2010).

Natural Area Preserve (NAP) – As defined by Washington State legislature's Natural Areas Preserve Act in 1972, these areas are designated to preserve the best remaining examples of many ecological communities including rare plant and animal habitat, and are to be used for education, scientific research, and to maintain Washington's native biological diversity.

Natural Resources Conservation Area (NRCA) – As defined by the Natural Resources Conservation Area program established by the Washington State legislature , these areas are established to protect outstanding examples of native ecosystems, habitat for endangered, threatened and sensitive plants and animals, and scenic landscapes. They are to be used for conservation purposes.

no impact – This rating represents conditions unique to each resource. It is defined in each resource chapter's section on impact levels, but generally indicates that current and future conditions would not be affected by the project.

non-attainment – An area that does not meet air quality standards set by the Clean Air Act for specified localities and periods.

non-firm transmission service – Transmission service that is not guaranteed to be available and is only available after commitments for firm and conditional service have been met.

non-motorized trail – A recreation trail typically open to horseback riding, mountain biking, and hiking.

non-wires measures – Non-transmission alternatives to transmission line construction that may include pricing strategies, demand reducing strategies, and strategic placement of generators.

northern spotted owl circles – The area around a documented northern spotted owl nest (activity center) that delineates the main home range or foraging area of the breeding pair. The circular area has a radius of 0.7 mile.

noxious weed – A non-native and invasive plant species designated by state law for some level of management.

open space – Land cover category used in the land analysis of this EIS. It contains areas that have not been developed and have the potential to be used for both production and non-production forest, and non-forested uses such as rural residential, agriculture, or recreation. For this EIS, this category includes area managed for commercial forest production by private companies much smaller than those included in the forest production category.

overload – Moving too much current flow over transmission facilities. Equipment has safeguards: in the event of system overload, switches will disconnect sensitive equipment from the flow of electricity.

palustrine – Relates to a system of inland, non-tidal wetlands characterized by the presence of trees, shrubs, and emergent. Palustrine wetlands range from permanently saturated or flooded land (as in marshes, swamps, and lake shores) to land that is wet only seasonally a class of wetland that is a freshwater wetland classification system.

peat – An unconsolidated deposit of plant remains in a water-saturated environment, such as a bog. Peat is an early stage in the development of coal.

pentachlorophenol (PCP) – Pentachlorophenol is an organochlorine compound used as a wood preservative, pesticide, and disinfectant. First produced in the 1930s, it is marketed under many trade names. People may be exposed to PCP in occupational settings through the inhalation of contaminated workplace air and dermal contact or with wood products treated with PCP. Also, general population exposure may occur through contact with contaminated environment media, particularly in the vicinity of wood treatment facilities and hazardous wastes sites.

perennial stream – A stream or portion of a stream that flows year-round and is considered permanent.

physiographic regions – A geographic region in which climate and geology have given rise to a variety of landforms different from those of surrounding regions.

plate footings – Used for suspension towers. They consist of a 4-foot by 4-foot steel plate buried about 11 feet deep for each tower foot.

Pleistocene – The epoch between about 2.6 million years and the present.

polychlorinated biphenyls (PCBs) – Polychlorinated biphenyls are a class of organic compounds. PCBs were widely used for many applications, especially as dielectric fluids in transformers, capacitors, and coolants. Due to PCB's toxicity and classification as a persistent organic pollutant, PCB production was banned by the United States Congress in 1979.

polycyclic aromatic hydrocarbons (PAHs) – Polycyclic aromatic hydrocarbons, also known as poly-aromatic hydrocarbons or polynuclear aromatic hydrocarbons are potent atmospheric pollutants. PAHs occur in oil, coal, and tar deposits, and are produced as byproducts of fuel burning (whether fossil fuel or biomass). As a pollutant, they are of concern because some compounds have been identified as carcinogenic, mutagenic, and teratogenic (can cause birth defects).

power circuit breakers – A switching device that can automatically interrupt power flow on a transmission line at the time of a fault.

pre-contact – Resources that date to before direct or indirect contact between Euro-Americans and Native Americans.

Priority Area – A designation under WDFW's Priority Habitats and Species list to indicate areas where species are considered a priority only within known limiting habitats (e.g., breeding areas) or within areas that support a relatively high number of individuals (e.g., regular large concentrations, rookeries, etc.).

priority habitat – A WDFW designation of habitat types with unique or significant value to many species. It may be described by a unique vegetation type or by a dominant plant species that is of primary importance to fish and wildlife (e.g., oak woodlands). A priority habitat may also be described by a successional stage (e.g., old growth or mature forest), or by a specific habitat feature of key value to fish and wildlife (e.g., talus slopes, caves, snags).

priority species – Under the WDFW, priority species are fish and wildlife species requiring protective measures or management actions to ensure their survival. A species identified and mapped as priority species fit one or more of the following criteria:

Criterion 1. State-Listed and Candidate Species.

Criterion 2. Vulnerable Aggregations (species or groups of animals susceptible to significant population declines, within a specific area or statewide, by virtue of their inclination to aggregate. Examples include heron rookeries, seabird concentrations, marine mammal haulouts, shellfish beds, and fish spawning and rearing areas.

Criterion 3. Species of Recreational, Commercial, and/or Tribal Importance whose biological or ecological characteristics make them vulnerable to decline in Washington or that are dependent on habitats that are highly vulnerable or are in limited availability.

Prime Farmland – Land that has the best physical and chemical characteristics for producing items such as food, feed, forage, fiber and oilseed crops, which have not already been targeted for urban development or water storage (Code of Federal Regulations [CFR] 730-733 section 657.5). The NRCS identifies soil mapping units within Washington State that qualify as prime based on specific soil criteria. Soil mapping units may be classified as prime farmland under current conditions or as prime farmland given that certain qualifying conditions exist on the site (e.g., "prime farmland if irrigated," "prime farmland when protected from flooding," etc.). In such cases, if the qualifying conditions do not exist, then the unit is considered "not prime."

pro forma open access tariff – This tariff defines the terms and conditions of point-to-point and network integration transmission services offered by BPA. Tariffs are schedules detailing utility rates, rules and regulations, and terms of service filed for approval with a regulatory agency. Usually relative to retail, end-use customer service.

protective relay – A safety measure designed to calculate operating conditions on an electrical circuit and to trip circuit breakers when a fault is detected.

pulling/tensioning site – Site used during construction where the conductors are pulled and tightened to the correct tension. Pulling/tensioning sites would located both within and just outside of the right-of-way where the proposed line turns in a different direction. These sites would create a temporarily disturbed area of about 300 feet long by 100 feet wide at each site.

pyroclastic flow – A hot flow composed of a mixture of gases and particles.

reach – A section of a river or stream between two defined points.

red flag —Cultural resources to which potential effects are considered difficult or impossible to avoid.

redd – A nest of fish eggs covered with gravel.

residual soil – A soil formed from, or resting on, consolidated rock of the same kind as that from which it was formed, and in the same location.

riffle – A stretch of shallow stream habitat with moderate to fast current and turbulent flow.

right-of-way – An easement for a certain purpose over the land of another, such as a strip of land used for a road, electric transmission line, pipeline, etc.

riparian – The three-dimensional zones of direct physical and biotic interactions between terrestrial and aquatic ecosystems located along rivers, creeks and lakes; boundaries of the riparian zone extend landward to the limits of flooding and upward into the canopy of streamside vegetation.

rip-rap – A loose assemblage of broken stones erected in water or on soft ground as a foundation.

river mile – Distance from a river mouth or other known locality to a specific site.

rural – Land cover category used in the land analysis of this EIS. The rural land cover category includes areas characterized by a diverse suite of land uses and features that are typical in rural areas. These range from agricultural uses to diffuse/low density residential development. In terms of development density criteria, the rural land cover type included those areas with approximately ≤1 residence per acre.

rural centers – Distinct areas of smaller lot patterns with residential development, small-scale business that provides convenience shopping and services to nearby rural residents, have access to arterial roadways, and are surrounded by protected rural landscapes of generally open land used for agriculture, forestry, large lot residential, recreational and environmental protection purposes.

safety backline (safe backline) – A "buffer" strip outside the edge of the right-of-way to assure reliability. It is created by cutting a strip of trees alongside the right-of-way, including trees tall enough to hit the conductor adjacent to the right-of-way. When an existing stand of trees next to the right-of-way is found to be so highly compromised that it is unstable as a whole, all trees from outside the right-of-way from the last tree tall enough to hit a conductor to the edge of the right-of-way would be removed.

salmonid – Fish belonging to the family of salmonidae, including salmon, trout, char, whitefish, and allied freshwater and anadromous fish.

scenic quality– A rating of the overall appeal of a view that is categorized as High, Medium, or Low, which is determined based on several key factors (BLM 1986). The key factors include landform, vegetation, water, color, influence of adjacent scenery, scarcity, and cultural modifications. With a maximum possible score of 32, values are totaled with results of 19 or more ranked "High", 12 to 18 ranked "Medium", and 11 or less ranked "Low".

scrub-shrub – Woody vegetation less than 20 feet tall.

sediment – Fragmental material that originates from the weathering of rocks.

sedimentary – Rocks or deposits formed by the deposition of sediment.

sensitive species – Washington or Oregon state listing of a fish or wildlife species. In Washington, the WDFW lists native species as sensitive if they are vulnerable or declining and likely to become endangered or threatened throughout a significant portion of its range within the state without cooperative management or removal of threats (WAC 232-12-297). In Oregon, the ODFW for fish and wildlife species, subspecies, or populations facing one or more threats to their populations or habitats (OAR 635-100-040). The Oregon listing is used to encourage voluntary actions that will improve species status, and contains the sub-categories "Critical" (imperiled with extirpation from a specific area of the state) and "Vulnerable" (facing one or more threats to populations or habitats).

sensitivity levels – In reference to visual resources, sensitivity is an evaluation of the viewer and as a way of ranking public concern.

series compensation – The use of devices such as capacitors or voltage regulators to improve performance of an electric system with respect to some specified characteristic. Such devices are used to increase capacity.

shrub – The shrubland cover category includes those areas dominated by shrub species or saplings, with greater than or equal to 30 percent aerial cover of these vegetation types.

single-circuit – One electrical circuit that consists of three separate conductors or bundles of conductors on one tower.

single-circuit tower – A tower that can support only one transmission line.

snags – Standing dead or dying trees. These occur as a result of age, disease, lighting, fire, animal damage, too much shade, and other factors. They are important to wildlife in both natural and landscaped settings.

snubs – Trenches about 8 feet deep by 4 feet wide by 12 feet long used to tie off the conductor after it is pulled through the towers and before it is strung under tension.

sock line – Thick rope placed in travelers (small wheels hung from the towers) by hand or by helicopter to help string conductor from dead-end to dead-end.

soil – Unconsolidated sediment that overlies bedrock.

sole source aquifer – An underground water source that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer. These areas have no alternative drinking water source(s) that could physically, legally, and economically supply all those who depend upon the aquifer for drinking water.

source wells – Group A wells (Washington's specific designation for public water systems regulated by the federal SDWA) and Group B wells (Washington's designation for public water systems smaller than the minimum cut-off defined by the SDWA).

spacer damper – A mechanical device attached to each subconductor of a conductor bundle both to damp vibrations and to prevent physical contact of subconductors.

spans – The horizontal distance between two adjacent towers.

special-status vegetation resource – Vegetation resources receiving special protections or considerations under state or federal regulations, including rare plants (federally or state-listed), WDFW priority habitats, and WNHP high quality native plant communities.

spread footings – Rock anchors required for footings when a suspension tower is built on solid bedrock located less than two feet below the surface. Six-inch-diameter holes are drilled into the bedrock about 11 feet deep and steel anchor rods are secured within the hole with concrete. The approximate size of each column is 4 feet in diameter and 20-30 feet tall.

spud – A heavy timber or pipe extending vertically through a well in the bottom of a barge or boat that is used for mooring in lieu of anchors.

staging area – An area used along or near the proposed transmission line for construction crews to store materials, equipment, and vehicles. Staging areas would be from 5 to 15 acres in size, depending on the number or location needed.

stranded use – Permanently limited access to agricultural or forest production areas.

stratovolcano – A volcano that is comprised of alternating layers of lava and pyroclastic deposits.

subduction – The process of one lithospheric plate descending beneath another.

subsidence – The gradual or rapid lowering of the ground surface from compressing, drying out, or lowering the groundwater table of subsidence susceptible soils.

substation – The site containing the terminal switching and transformation equipment needed to distribute power from a transmission line. These non-generating electrical power stations serve to transform voltages to higher or lower levels, and serve as a delivery point to individual customers such as utilities or large industries.

substation dead-end towers – Towers within the substation where incoming or outgoing transmission lines end; typically these are the tallest structures within the substation.

substation rock surfacing – A 3-inch or more layer of rock, selected for its insulating properties, which is placed on the ground within the substation to protect operation and maintenance personnel from danger during substation electrical failures.

substrate – An underlying layer upon which other materials exist or are placed.

suspension tower – A tower designed to support conductors strung along a virtually straight line with only small turning or descending or ascending angles.

switches – Devices that mechanically disconnect or isolate equipment. Usually located on both sides of circuit breakers.

talus – A sloping mass of coarse rock fragments accumulated at the base of a cliff or slope.

tectonic – The process and dynamics of lithospheric plate movement.

tensioner – A device used to pull the conductors to the correct sag so that proper ground clearance is maintained.

timber production – Land cover category used in the land analysis of this EIS. Forest production areas are within land owned or managed by timber companies (Weyerhaeuser, Longview Timber, and Sierra Pacific), utilities (PacifiCorp), or the state (WDNR) and are primarily used for timber production. These areas are mostly forested (some with mature forests and forested wetlands), cleared, or have been replanted. There are also existing access roads within these areas that were built for hauling cut timber.

thermal plant – A type of electric generating station or power plant, such as gas, coal, and nuclear plants, in which the source of energy for the prime mover is heat.

threatened species – Federal or Washington State listing status of a plant or wildlife species. Under federal listing (as determined by the USFWS under the ESA) these species (or subspecies, variety, or evolutionarily significant unit of a species) are considered likely to become endangered within the foreseeable future. The ESA protects threatened species and their habitats by prohibiting "take" (harassment, disturbance, removal, hunting, etc.) of listed animals or plants, except under Federal permit. The ESA also regulates the designation of "critical habitat" for listed species, which may include areas not currently occupied by the species but essential to its conservation. Under Washington State listing (as determined by the WDFW) these species are native to the state and are likely to become endangered in the foreseeable future throughout a significant portion of its range within the state without cooperative management or removal of threats (WAC 232-12-297).

toxic substance – A toxic substance is any chemical or mixture that may be harmful to the environment and to human health if inhaled, swallowed, or absorbed through the skin. A toxic substance would also include any chemical or substance regulated by the Toxic Substances Control Act regulations (40 CFR Parts 700 through 766).

Traditional Cultural Property (TCP) – A property or place that is eligible for inclusion on the National Register of Historic Places because of its association with cultural practices and beliefs that are rooted in the history of a community, and are important to maintaining the continuity of that community's traditional beliefs and practices.

transfer capability – Amount of electric power that can be transferred over the interconnected transmission network in a reliable manner at a given time.

transpiration – Loss of water vapor from parts of plants.

triple-circuit – The placing of three separate electrical circuits on the same tower.

turbidity – The extent to which water is muddy or cloudy due to the presence of suspended matter.

unconsolidated – A soil or sediment that is loosely aggregated or uncemented.

urban/suburban – Land cover category used in the land analysis of this EIS. The urban/suburban land cover category includes high to mid-density development and infrastructure associated with urban and suburban environments, including roads, commercial buildings, and residences and associated landscaping, and associated impervious surfaces (e.g., parking lots).

vegetation type – A category representing the general vegetation conditions in a given area.

viewshed – The landscape that can be directly seen under favorable atmospheric conditions, from a viewpoint or along a transportation corridor.

volt – The international system unit of electric potential and electromotive force.

voltage – The driving force that causes a current to flow in an electrical circuit.

water bar – A diagonal channel across a road surface that diverts surface water off the road into a stable drainway. By constructing a series of water bars at intervals along a road, the volume of erosive water flowing down the road is reduced.

water right – A legal authorization to use a certain amount of public water for a designated purpose.

water wells – Exempt and non-exempt wells in the State of Washington's Department of Ecology well database.

Water Resource Inventory Area (WRIA) – The State of Washington's Department of Ecology and other natural resources agencies have divided the state into 62 "Water Resource Inventory Areas" or "WRIAs" to delineate the state's major watersheds.

watershed – An area draining into a river, lake, or waterbody.

Watershed Administrative Unit (WAU) – Used by the Timber/Fish/Wildlife cooperators as the boundaries for watershed analysis studies and other natural resources management purposes on state and privately owned lands. WAU represents the administrative boundaries of 846 units. The boundaries are mainly along drainage divides (ridges), with some along rivers and other WDNR management boundaries.

wellfield – Tract of land that contains a number of existing or proposed wells for supplying water as specified in the wellfield protection maps.

wellhead protection areas – Surface and subsurface zones surrounding a well or wellfield supplying a public water system that are protected areas designed to reduce the risk of contamination of water supply wells associated with spills and discharges of contaminants.

wetland – An area of land where soil is saturated with moisture either permanently or seasonally. Indicators of wetland include the type of vegetation, soil characteristics, and hydrology of the area.

wetland plant communities – An assemblage of plants adapted to wetlands (areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions; 33 CFR 328.3, 40 CFR 230.3).

woody debris – Materials left over from cutting, harvesting, natural breakage or falling, such as limbs or branches of a tree.

yearling – A fish that is one year old.

yolk sacs – A membranous sac attached to an embryo, providing early nourishment in the form of yolk in bony fishes, sharks, reptiles, birds, and primitive mammals.

32.2 Acronyms

µm	micrometers
A	Amperes
AC	alternating current
ACGIH	American Conference of Governmental Hygienists
ACHP	Advisory Council on Historic Preservation
ADA	Americans with Disabilities Act
ADPA	Archaeological Data Preservation Act
AINW	Archaeological Investigations Northwest, Inc.
AOC	Administrative Order of Consent
APE	area of potential effect
APLIC	Avian Power Line Interaction Committee
ARPA	Archaeological Resources Protection Act
ATV	all-terrain vehicle
bgs	below ground surface
BLM	Bureau of Land Management
BMP	best management practice
BNSF	Burlington Northern Santa Fe Railway Company
BPA	Bonneville Power Administration
CAA	Clean Air Act
CAO	Critical Area Ordinance
CARA	critical aquifer recharge areas
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFC	chlorofluorocarbons
CFR	Code of Federal Regulations

CH_4	methane
CMP	comprehensive management plan
COA	Conservation Opportunity Area
CO_2	carbon dioxide
CO_{2e}	carbon dioxide equivalents
Corps	United States Army Corps of Engineers
CRP	Conservation Reserve Program
C-TRAN	Transportation Benefit Authority
CUBS	community urban bus service
CUSV	Current Use Special Valuation
CWA	Clean Water Act
CWCOG	Cowlitz-Wahkiakum Council of Governments
DAHP	Department of Archaeology and Historic Preservations
dBA	decibel (A-weighted)
DC	double-circuit
DEQ	Department of Environmental Quality
DGER	Division of Geology and Earth Resources
DNR	Washington State Department of Natural Resources
DOE	United States Department of Energy
DSL	Oregon Department of State Lands
DT	danger tree
Ecology	Washington State Department of Ecology
EDNA	environmental designations for noise abatement
EFH	essential fish habitat
EFSC	(Oregon) Energy Facility Siting Council
EFSEC	(Washington) Energy Facility Site Evaluation Council

EIA	Energy Information Administration
EIS	environmental impact statement
EMF	electromagnetic fields
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESRI	Environmental Systems Research Institute, Inc.
ESU	evolutionarily significant unit
F	Fahrenheit
FAA	Federal Aviation Administration
FCDP	Federal Land Policy and Management Act
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FHWA	Federal Highway Administration
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
FIRM	Flood Insurance Rate Map
FLMPA	Federal Land Policy Management Act
FR	Federal Register
GHG	greenhouse gas
GIL	gas insulated line
GIS	geographic information system
GMA	Growth Management Act
Gorge	Columbia River Gorge
gpm	gallons per minute
GWP	global warming potential
H_2O	water

HBC	Hudson's Bay Company
HCP	habitat conservation plan
HFC	hydrofluorocarbons
HVAC	high voltage alternating current
HVDC	high voltage direct current
HVED	high voltage extruded dielectric
I	Interstate
ICBEMP	Interior Columbia Ecosystem Management Project
IPCC	International Panel on Climate Change
IVM	Integrated Vegetation Management
JCTRA	Jones Creek Trail Riders Association
kV	kilovolt
kV/m	kilovolts per meter
kWh	kilowatt hours
L_{50}	audible noise level exceeded 50 percent of the time during foul weather
LCDC	(Oregon) Land Conservation and Development Commission
L_{dn}	day-night noise level
L_{eq}	equivalent sound level
MAP	Mitigation Action Plan
MBF	Thousand board feet
MCCFP	Multnomah County Comprehensive Framework Plan
MCL	maximum contaminant level
Metro	Metropolitan Service District
Mg/L	milligram per liter
MOA	Memoranda of Agreement
MOU	Memoranda of Understanding

msl	mean sea level
MVCD	Minimum Vegetation Clearance Distance
MW	megawatt
MWh	megawatt hour
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAP	Natural Area Preserve
NC	no change from the action alternative
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NESC	National Electrical Safety Code
NHD	National Hydrographic Dataset
NHD	National Hydrographic Dataset
NHPA	National Historic Preservation Act
NLCD	National Land Cover Data
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOAA Fisheries	NOAA National Marine Fisheries Service
NOS	network open season
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NPS	National Park System
NRCA	Natural Resources Conservation Area
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places

NSA	National Scenic Area
NWI	National Wetland Inventory
NWPCC	Northwest Power and Conservation Council
O_3	ozone
OAR	Oregon Administrative Rules
OASIS	Open-Access Same-Time Information System
OATT	Open Access Transmission Tariff
ODA	Oregon Department of Agriculture
ODEQ	Oregon Department of Environmental Quality
ODFW	Oregon Department of Fish and Wildlife
ODOE	Oregon Department of Energy
ODOT	Oregon Department of Transportation
OHWM	ordinary high water mark
ORBIC	Oregon Biodiversity Information Center
ORS	Oregon Revised Statutes
ORV	off-road vehicle
ORWAP	Oregon Rapid Wetland Assessment Protocol
OSU	Oregon State University
PAB	palustrine aquatic bed
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyls
PCP	pentachlorophenol
PDX	Portland International Airport
PEM	palustrine emergent
PEP	Permission to Enter Property
PFC	perfluorocarbons

PFO	palustrine forested
PGA	peak ground acceleration
PGE	Portland General Electric
PHS	Priority Habitats and Species
PM	particulate matter
PM10	particulate matter smaller than 10 µm
PM2.5	particulate matter smaller than 2.5 µm
PO	policy
POW	palustrine open water
ppm	parts per million
PSS	palustrine scrub-shrub
PUD	Clark Public Utility District
RA	Risk Assessment
RAS	remedial action scheme
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
RI/FS	remediation investigation/feasibility study
RM	river mile
RMC	Reynolds Metals Company
ROD	Record of Decision
RV	recreational vehicle
SBL	safety backline
SC	single-circuit
SDWA	Safe Drinking Water Act
SEPA	State Environmental Policy Act
SF_6	sulphur hexafluoride

SHA	site hazard assessment
SHPO	State Historic Preservation Office (or Officer)
SMA	Special Management Area (in National Scenic Area)
SMP	shoreline master program
SOA	South of Allston
SOAL	State Owned Aquatic Land
SPCC	Spill Prevention, Control, and Countermeasure (plan)
SPS	Spokane, Portland, and Seattle
SR	State Route
SWCAA	Southwest Clean Air Agency
SWPPP	Stormwater Pollution Prevention Plan
TC	triple-circuit
TCC	Terrestrial Coordination Committee
TCP	Traditional Cultural Property
THPO	Tribal Historic Preservation Office (or Officer)
TMDL	total maximum daily load
TRIP	Troutdale Reynolds Industrial Park
TSCA	Toxic Substances Control Act
TSD	treatment, storage, and disposal
U.S.	United States
UAO	unilateral order
UNOS	Urban Natural Open Space
USA	unconsolidated sedimentary aquifer
USC	United States Code
USCG	United States Coast Guard
USDA	United States Department of Agriculture

USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VCPRD	Vancouver-Clark Parks and Recreation Department
V/m	volts per meter
VRM	visual resource management
WAC	Washington Administrative Code
WARM	Washington ranking method
WAU	Watershed Administrative Unit
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington State Department of Natural Resources
WECC	Western Electricity Coordinating Council
WHMP	Wildlife Habitat Management Plan
WNHP	Washington Natural Heritage Program
WRIA	Water Resource Inventory Area
WSDA	Washington State Department of Agriculture
WSDOT	Washington State Department of Transportation
WSU	Washington State University
XLPE	polyethylene

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